

**EXHIBIT 1**

1 HARMEET K. DHILLON (SBN: 207873)  
2 harmeet@dhillonlaw.com  
3 MARK P. MEUSER (SBN: 231335)  
4 mmeuser@dhillonlaw.com  
5 GREGORY R. MICHAEL (SBN: 306814)  
6 gmichael@dhillonlaw.com  
7 DHILLON LAW GROUP INC.  
8 177 Post Street, Suite 700  
9 San Francisco, California 94108  
10 Telephone: (415) 433-1700  
11 Facsimile: (415) 520-6593

12 ROBERT DUNN (SBN: 275600)  
13 rdunn@eimerstahl.com  
14 EIMER STAHL LLP  
15 99 South Almaden Blvd., Suite 662  
16 San Jose, CA 95113  
17 (669) 231-8755

RYAN J. WALSH (pro hac vice pending)  
rwalsh@eimerstahl.com  
JOHN K. ADAMS (pro hac vice pending)  
jadams@eimerstahl.com  
AMY C. MILLER (pro hac vice pending)  
amiller@eimerstahl.com  
EIMER STAHL LLP  
10 East Doty Street, Suite 800  
Madison, WI 53703  
(608) 441-5798

*Attorneys for Plaintiffs*

18 **UNITED STATES DISTRICT COURT**  
19 **CENTRAL DISTRICT OF CALIFORNIA**

20 **MATTHEW BRACH**, an individual,  
21 *et al.*,

22 Plaintiffs,  
23 v.

24 **GAVIN NEWSOM**, in his official  
25 capacity as the Governor of California,  
26 *et al.*,

27 Defendants.  
28

Case Number: 2:20-CV-06472-DDP-AFM

**MEMORANDUM OF POINTS AND  
AUTHORITY IN SUPPORT OF  
MOTION FOR PRELIMINARY  
INJUNCTION**

Judge: Hon. Dean D. Pregerson  
Hearing Date: August 31, 2020  
Time: 10:00 a.m.  
Courtroom: 9C

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

**TABLE OF CONTENTS**

INTRODUCTION ..... 1

RELEVANT FACTUAL BACKGROUND ..... 4

    I. Governor Newsom Shuttters California’s Schools in the Spring, Causing Extreme Hardship for All Students, but Especially for Poor, Minority, and Disabled Students ..... 4

    II. The Data Show that Children Are Unlikely to Spread the Coronavirus or Suffer Adverse Results from COVID-19, and Many European Schools Reopened Without Causing a Resurgence of Coronavirus ..... 11

    III. In Light of This Evidence, School Districts in California Begin Preparing to Reopen Safely for the 2020-21 School Year..... 13

    IV. The California Department of Public Health Orders All Schools to Remain Closed, Except for Schools in a Small Number of Counties ..... 14

    V. Plaintiffs Have Been and Will Continue to be Harmed by the Governor’s Mandatory School Closures ..... 16

LEGAL STANDARD..... 17

ARGUMENT ..... 18

    I. THERE IS A STRONG LIKELIHOOD THAT PLAINTIFFS WILL SUCCEED ON THE MERITS..... 18

        A. Defendants’ Orders Banning In-Person Instruction at Every School on the State’s Monitoring List Violate the Fourteenth Amendment’s Due Process and Equal Protection Clauses. .... 18

            1. The Orders Infringe Californians’ Fundamental Right to Education, Failing Strict Scrutiny ..... 18

                a. The School Closure Orders Implicate the Substantive-Due-Process Right to Education, Which is Deeply Rooted in Our History and Jurisprudence ..... 18

                b. Barring Access to Schools, Which Has Devastating Consequences, Plainly Burdens the Fundamental Right to Adequate Education ..... 22

                c. The School Closure Orders Fail Heightened Scrutiny ..... 24

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

- 2. Regardless of the Level of Scrutiny, the Orders Violate Equal Protection ..... 27
  - a. The Orders Fail Heightened Scrutiny Under *Plyler v. Doe*..... 28
  - b. The School Closure Orders Fail Even Rational Basis Review.... 29
- B. Defendants’ Orders Violate Title VI’s Implementing Regulations Because They Disparately Burden Racial Minorities ..... 30
- C. Defendants’ Orders Violate Federal Laws Requiring Equal Educational Access for Disabled Students ..... 32
  - 1. The Orders Violate the Individuals with Disabilities Education Act ..... 32
  - 2. The Orders Violate the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act ..... 36
  - 3. Plaintiffs Were Not Required to Exhaust Administrative Remedies Before Raising Claims Under the IDEA, ADA, or Rehabilitation Act ..... 37
- II. PLAINTIFFS AND THEIR CHILDREN FACE IMMINENT IRREPARABLE HARM ABSENT IMMEDIATE INJUNCTIVE RELIEF .. 38
- III. THE REMAINING FACTORS WEIGH IN FAVOR OF GRANTING INJUNCTIVE RELIEF ..... 39
- CONCLUSION..... 40



**TABLE OF AUTHORITIES**

<b>CASES</b>	<b>PAGE(S)</b>
<i>Alliance for the Wild Rockies v. Cottrell</i> , 632 F.3d 1127 (9th Cir. 2011).....	17
<i>Arizona Dream Act Coal. v. Brewer</i> , 757 F.3d 1053 (9th Cir. 2014) .....	27
<i>Arizona Dream Act Coalition v. Brewer</i> , 757 F. 3d 1053(9th Cir. 2014) .....	39
<i>Ashland Sch. Dist. v. Parents of Student E.H.</i> , 587 F.3d 1175 (9th Cir. 2009).....	32
<i>Bd. of Educ. v. Pico</i> , 457 U.S. 853 (1982).....	20
<i>Boddie v. Connecticut</i> , 401 U.S. 371 (1971) .....	20
<i>Brown v. Board of Education</i> , 347 U.S. 483 (1954) .....	21
<i>Citizens United v. FEC</i> , 558 U.S. 310 (2010) .....	20
<i>City of Cleburne, Tex. v. Cleburne Living Ctr.</i> , 473 U.S. 432 (1985).....	27
<i>City of New Orleans v. Dukes</i> , 427 U.S. 297 (1976).....	29
<i>Crowder v. Kitagawa</i> , 81 F.3d 1480 (9th Cir. 1996) .....	36
<i>D.E. v. Cent. Dauphin Sch. Dist.</i> , 765 F.3d 260 (3d Cir. 2014).....	37
<i>Darensburg v. Metro. Transp. Comm’n</i> , 636 F.3d 511 (9th Cir. 2011).....	31
<i>Doe By &amp; Through Brockhuis v. Arizona Dep’t of Educ.</i> , 111 F.3d 678 (9th Cir. 1997) .....	37
<i>Duvall v. Cty. of Kitsap</i> , 260 F.3d 1124 (9th Cir. 2001) .....	36
<i>E.R.K. ex rel. R.K. v. Hawaii Dep’t of Educ.</i> , 728 F.3d 982 (9th Cir. 2013) .....	33
<i>Elrod v. Burns</i> 427 U.S. 347 (1976) .....	39
<i>Andrew F. ex rel. Joeseeph F. v. Douglas Cty. School Dist. RE-1</i> , 137 S. Ct. 988 (2017) .....	34
<i>Andrew F. ex rel. Joseph F. v. Douglas Cty. Sch. Dist. RE-1</i> , 137 S. Ct. 988 (2017) .....	32
<i>Goss v. Lopez</i> , 419 U.S. 565 (1975) .....	21
<i>Griffin v. Illinois</i> , 351 U.S. 12 (1956).....	20
<i>Handberry v. Thompson</i> , 446 F.3d 335 (2d Cir. 2006) .....	38
<i>Hernandez v. Sessions</i> , 872 F.3d 976 (9th Cir. 2017). .....	40

1 *Hoelt v. Tucson Unified Sch. Dist.*, 967 F.2d 1298 (9th Cir. 1992) ..... 37

2 *K.B. on behalf of S.B. v. Katonah Lewisboro Union Free Sch. Dist.*, 2019 WL

3 5553292 (S.D.N.Y. Oct. 28, 2019)..... 33

4 *Kadmas v. Dickinson Pub. Sch.*, 487 U.S. 450 (1988) ..... 22

5 *Leiva-Perez v. Holder*, 640 F.3d 962 (9th Cir. 2011)..... 17

6 *Lopez v. Heckler*, 713 F.2d 1432 (9th Cir. 1983). ..... 40

7 *McDonald v. City of Chicago*, 561 U.S. 742 (2010) ..... 19

8 *Melendres v. Arpaio*, 695 F.3d 990 (9th Cir. 2012). ..... 40

9 *Meridian Joint Sch. Dist. No. 2 v. D.A.*, 792 F.3d 1054 (9th Cir. 2015)..... 37

10 *Merrifield v. Lockyer*, 547 F.3d 978 (9th Cir. 2008)..... 30

11 *Meyer v. Nebraska*, 262 U.S. 390 (1923) ..... 21

12 *Obergefell v. Hodges*, 135 S. Ct. 2584 (2015) ..... 18

13 *Papasan v. Allain*, 478 U.S. 265 (1986)..... 22

14 *Park ex rel. Park v. Anaheim Union Sch. Dist.*, 464 F.3d 1025 (9th Cir. 2006)..... 33

15 *Plyler v. Doe*, 457 U.S. 202 (1982) ..... 22

16 *Plyler v. Doe*, 457 U.S. 202 (1982) ..... 27

17 *Poe v. Ullman*, 367 U.S. 497 (1961)..... 19

18 *Price v. Commonwealth Charter Academy – Cyber School*, 2019 WL 4346014 (E.D.

19 Penn. Sept 12, 2019)..... 33

20 *Reno v. Flores*, 507 U.S. 292 (1993) ..... 24

21 *Rent-A-Ctr., Inc. v. Canyon Television & Appliance Rental, Inc.*, 944 F.2d 597

22 (9th Cir. 1991) ..... 38

23 *Roe v. Wade*, 410 U.S. 113 (1973) ..... 18

24 *San Antonio Independent School District v. Rodriguez*, 411 U.S. 1 (1973) ..... 22

25 *Sierra On-Line, Inc. v. Phoenix Software, Inc.*, 739 F.2d 1415 (9th Cir. 1984) ..... 17

26 *United States v. Harding*, 971 F.2d 410 (9th Cir. 1992) ..... 28

27 *Van Duyn ex rel. Van Duyn v. Baker Sch. Dist. 5J*, 502 F.3d 811 (9th Cir. 2007) ..... 34

28 *Vance v. Bradley*, 440 U.S. 93 (1979) ..... 29

*Winter v. Natural Res. Def. Council, Inc.*, 555 U.S. 7 (2008)..... 17

1 *Wright v. Incline Vill. Gen. Improvement Dist.*, 665 F.3d 1128 (9th Cir. 2011)..... 18

2

**STATUTES**

3

4 20 U.S.C. § 1401(26) ..... 33

5 20 U.S.C. § 1401(9) ..... 32

6 20 U.S.C. § 1401(9)(D)) ..... 34

7 20 U.S.C. § 1412(a)(1)) ..... 32

8 20 U.S.C. § 1415(e)(2)..... 37

9 20 U.S.C. §§ 1401(26), (29) ..... 32

10 42 U.S.C. § 2000d..... 30

11

**REGULATIONS**

12

13 28 C.F.R. § 42.104(b)(2)..... 31

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

1 **MEMORANDUM OF POINTS AND AUTHORITIES**

2 **INTRODUCTION**

3 With the stroke of a pen, Governor Gavin Newsom has closed all public  
4 schools, charter schools, and private schools in 37 of California’s 58 counties,  
5 consigning *millions* of students and their families to another semester (and perhaps  
6 even a year or more) of so-called “distance learning,” which has proven to be an  
7 utter failure. The Governor’s one-size-fits-all approach has upended the carefully  
8 tailored plans that teachers and administrators have developed to reopen schools  
9 this fall safely and effectively.

10 The effects of this ham-handed policy are as predictable as they are tragic.  
11 Thousands of students will essentially drop out of school, whether because they  
12 lack the technological resources to engage with “online learning” or because their  
13 parents cannot assist them. Thousands more will fall behind academically despite  
14 their efforts to remain engaged, because teachers cannot provide the individualized  
15 attention they need. And for some students, the forced seclusion will have even  
16 more dire consequences, including domestic abuse, depression, hunger, and  
17 suicide. The order will also inflict collateral damage on families, as parents are  
18 forced to quit their jobs or scale back their hours to supervise their children’s  
19 “distance learning.” While affluent families can likely avoid the worst of these  
20 problems by hiring tutors, forming educational “pods” with other families, or home  
21 schooling, the “distance learning” regime will inflict massive harm on students and  
22 parents from disadvantaged backgrounds, many of whom are Black and Latino, as  
23 well as those with learning disabilities and special needs. Experts estimate that the  
24 Governor’s decision could set the state’s most vulnerable students back a year or  
25 more, and some may never recover.

26 Given these enormous state-wide disruptions, one would expect the order to  
27 be based on scientific evidence showing that opening schools poses an  
28 unacceptable risk of spreading COVID-19. But it is not. On the contrary, the  
scientific data has proven that the risks of COVID-19 to school-age children are

1 negligible, as explained in the numerous expert declarations submitted by some of  
2 the nation’s leading epidemiologists and physicians. Indeed, *not one person* under  
3 the age of 18 has died of COVID-19 in California. The disease ravaging our  
4 nation’s elderly is far less deadly to children than seasonal influenza. Scientists  
5 have also discovered that children hardly ever transmit the virus to adults. The  
6 CDC recently published a report based on data from South Korea, which found that  
7 less than 2% of new transmissions detected were attributed to those between 0 to  
8 20 years old. Less than 1% of new transmissions were attributed to those under 10,  
9 the population most in need of in-person education. The CDC has thus urged the  
10 nation’s schools to resume in-person education this fall. Dozens of other countries  
11 have already reopened their schools without social distancing, mask wearing, or  
12 other protective measures—yet none of these countries has reported an increase in  
13 new cases resulting from student-to-student or student-to-teacher contact. In short,  
14 the Governor’s drastic and devastating moratorium on in-person education is  
15 completely at odds with everything we now know about COVID-19.

16 At best, the Governor’s order is irrational; at worst, it is downright  
17 dangerous. This Court should issue a preliminary injunction because the  
18 Governor’s order violates the Fourteenth Amendment of the United States  
19 Constitution, which protects Californians’ fundamental (or, at least, quasi-  
20 fundamental) right to a basic minimum education and forbids states from enforcing  
21 laws—especially laws purporting to shutter school-house doors—that are utterly  
22 irrational. The order also violates the Constitution’s guarantee of equal protection  
23 because while it bars in-person education at schools in counties on the state’s  
24 monitoring list (there are currently 37 such counties) it allows in-person education  
25 at schools in every other county. Whatever level of scrutiny applies to this unequal  
26 treatment, the order fails it, because barring in-person education has no rational  
27 relationship to the state’s interest in slowing the spread of COVID-19. Nor is it  
28 narrowly tailored to further any compelling state interest related to public health.  
The order also tramples the rights provided by Title VI of the Civil Rights Act of

1 1964 and other federal laws, which guarantee access to education for students with  
2 disabilities and prohibit state action having a disparate impact on racial minorities,  
3 as closing schools certainly will.

4 The remaining preliminary-injunction factors overwhelmingly favor  
5 Plaintiffs, who represent a diverse, cross-section of the millions of families and  
6 students most harmed by the Governor’s order. For example, Plaintiff Jess Petrilla  
7 noticed a significant decline in his kindergarten son’s discipline and engagement  
8 after his school transitioned to distance learning. His wife was forced to take time  
9 off work to oversee her son’s education, and the Petrillas are concerned that their  
10 son is going to fall farther behind academically if school is not opened in the fall.  
11 Plaintiff Christine Ruiz has two sons in public school who have been diagnosed  
12 with autism. Her 15-year old son has an Individual Education Program (“IEP”)  
13 mandated by law, but he received none of the services required by the IEP when  
14 schools closed in March. Given the individualized attention required by the IEP,  
15 the school is unlikely to provide any of those services this fall if the Governor’s  
16 ban on in-person education is upheld. Plaintiff Marianne Bema, originally from  
17 Cameroon, is a single mother of three school-aged children. Ms. Bema lacks a solid  
18 internet connection and faces a language barrier that makes it difficult for her  
19 provide the support her children need in the absence of in-person schooling. She is  
20 concerned that her children will not progress academically this year if their school  
21 remains shuttered. Similar struggles are shared by all of the Plaintiffs, and by  
22 millions of other California families.

23 The interests of the public demand that the orders be enjoined and that the  
24 choice regarding whether and how to open schools safely be returned to the  
25 counties, which are more than up to the task of balancing public health against the  
26 need to educate our children.

1 **RELEVANT FACTUAL BACKGROUND**

2 **I. Governor Newsom Shuttters California’s Schools in the Spring, Causing**  
3 **Extreme Hardship for All Students, but Especially for Poor, Minority,**  
4 **and Disabled Students**

5 On March 4, 2020, Governor Gavin Newsom proclaimed a State of Emergency  
6 as a result of the threat of COVID-19.<sup>1</sup> On March 19, 2020, Governor Newsom  
7 issued Executive Order N-33-20, which provided that “all residents are directed to  
8 immediately heed the current State public health directives.”<sup>2</sup> The state public health  
9 directive, in turn, required “all individuals living in the State of California to stay  
10 home or at their place of residence except as needed to maintain continuity of  
11 operations of the federal critical infrastructure sectors ... .” *Id.* The public health  
12 directive provided that its directives “shall stay in effect until further notice.” *Id.* On  
13 or about May 4, 2020, Governor Newsom issued Executive Order N-60-20 in which  
14 he ordered “All residents are directed to continue to obey State public health  
15 directives, as made available at [https://covid19.ca.gov/stay-home-except-for-essential](https://covid19.ca.gov/stay-home-except-for-essential-needs/)  
16 [needs/](https://covid19.ca.gov/stay-home-except-for-essential-needs/) and elsewhere as the State Public Health Officer may provide.” *Id.* Governor  
17 Newsom’s Order directly conflicts with substantial evidence that closing schools is  
18 *more* dangerous to students than allowing students to return to school this fall.

19 The World Health Organization (WHO) and US Centers for Disease Control  
20 (CDC) have each issued guidance on school opening emphasizing that school  
21 opening decisions should be based on the “[c]urrent understanding about COVID-19  
22 transmission and severity in children,” the “[l]ocal situation and epidemiology of  
23 COVID-19 where the school(s) are located,” and the “[s]chool setting and ability to  
24 maintain COVID-19 prevention and control measure.” Bhattacharya Decl. ¶¶ 16-18.  
25 The WHO guidance explicitly recommends the consideration of “what harm might

26 <sup>1</sup> Executive Dept. of the State of California, Executive Order N-33-20, March 19,  
27 2020, available as of the date of filing: [https://www.gov.ca.gov/wp-](https://www.gov.ca.gov/wp-content/uploads/2020/04/N-54-20-COVID-19-text-4.22.20.pdf)  
28 [content/uploads/2020/04/N-54-20-COVID-19-text-4.22.20.pdf](https://www.gov.ca.gov/wp-content/uploads/2020/04/N-54-20-COVID-19-text-4.22.20.pdf).

<sup>2</sup> Executive Dept. of the State of California, Executive Order N-33-20, March 19,  
2020, available as of the date of filing: [https://covid19.ca.gov/img/Executive-Order-](https://covid19.ca.gov/img/Executive-Order-N-33-20.pdf)  
[N-33-20.pdf](https://covid19.ca.gov/img/Executive-Order-N-33-20.pdf).



1 occur due to school closure (e.g. risk of non-return to school, widening disparity in  
2 educational attainment, limited access to meals, domestic violence aggravated by  
3 economic uncertainties etc.), and the need to maintain schools at least partially open  
4 for children whose caregivers are ‘key workers’ for the country.” *Id.* Likewise, the  
5 CDC guidance suggests keeping schools open even if there is moderate community  
6 spread of SARS-CoV-2 infection, with school closures limited only to communities  
7 with “substantial” community spread. *Id.* ¶ 18.

8         The CDC estimate of the population-wide death rate of COVID-19 is 0.26%.  
9 Lyons-Weiler Decl. ¶ 4. But the vast majority of this risk is in the elderly and in  
10 people whose overall health has been significantly deteriorated prior to infection  
11 (e.g., individuals with pre-existing chronic pulmonary illness, whose death rate is  
12 6.3%, cardiovascular illness (10.5%), high blood pressure (6%), adults with diabetes  
13 (7.3%), and cancer (5.6%)). *Id.* Even these rates—which are from the earliest reports  
14 in the outbreak, from Wuhan City in Hubei Province, China—are massively inflated  
15 because they are only symptomatic case fatality rates, not infection case fatality rates.  
16 *Id.*

17         Unlike pneumonia from influenza viruses, in which the risk of the death to  
18 children is increased, COVID-19 death rates are effectively zero for children aged 0-  
19 10 and adolescents ages 11-20. *Id.* ¶ 6. Early data from South Korea, for example,  
20 reported zero deaths for children aged 0 to 20 – the same rate indicated by data from  
21 Italy. The CDC reports a total of 226 COVID-19 deaths in persons under 24 across  
22 the US, out of a total of 26,808 deaths for that age group over the same time period  
23 from all causes. Thus, COVID-19 currently accounts for 0.84% of all deaths in  
24 people aged 0 to 24 year. *Id.* This does not come close to meeting the criterion used  
25 to classify infectious diseases as an “epidemic” (between 6 and 7%). *Id.* By  
26 comparison, influenza and pneumonia not attributed to COVID-19 led to 966 deaths  
27 over the same time period in persons aged 0 to 24. *Id.* Despite this evidence, the  
28 Governor’s stay-at-home order requires all California schools to close their doors and



1 provide only online learning; a woefully inadequate form of “education,” especially  
2 for minority and disabled students.

3 “[R]eopening of schools is necessary to prevent children’s brain development  
4 from being significantly inhibited. Addison Decl. ¶ 5. “Developing brains need  
5 guided stimulation for effective neural pathways to be established [as] [t]hese  
6 pathways [known as ‘synapses’] are communication sites where neurons pass nerve  
7 impulses among themselves.” *Id.* ¶ 7. “This process facilitates learning [and]  
8 [e]xperiences that are provided through the back and forth interactions among  
9 teachers, students, and peers determine whether these synapses are strengthened or  
10 weakened. *Id.* If these experiences are inconsistent or interrupted, synaptic pruning  
11 will occur and impede ultimate development. Forcing children to stare at computer  
12 screens for extended periods of time has detrimental effects on children’s brains; so  
13 much so that prolonged screen time produces imaging results similar to the brains of  
14 people on cocaine and alcohol. Sutton Decl. ¶ 8.

15 Digital learning overall has proven to be far less effective than in-person  
16 learning. A study by Stanford University found that “white, non-poverty, non-  
17 “English Language Learner” and non-special education students who were subject to  
18 virtual learning were behind their in-person peers to an extent that reflected an  
19 equivalent of 180 fewer days of instruction in math and 72 fewer days of instruction  
20 in reading.” Keech Decl. ¶ 16 (emphasis omitted). Another study by Brown  
21 University projected that, as a result of spring shut downs, students likely would  
22 achieve only “63-68% of the learning gains in reading relative to a typical school  
23 year” and only “37-50% of the learning gains in math.” Megan Kuhfeld, *et al.*,  
24 *Projecting the potential impacts of COVID-19 school closures on academic*  
25 *achievement*, Brown University EdWorkingPaper No. 20-226, at 2, 23 (May 2020).<sup>3</sup>  
26 A study by McKinsey & Company showed that, even for children receiving average-  
27 quality online learning in the fall of 2020, students would lose “three to four months  
28

---

<sup>3</sup> Available as of the date of filing:  
<https://www.edworkingpapers.com/sites/default/files/ai20-226-v2.pdf>.

1 of learning” by January 2021. Emma Dorn, et al., *COVID-19 and student learning in*  
2 *the United States: The hurt could last a lifetime*, McKinsey & Company (June 1,  
3 2020).<sup>4</sup>

4 This disadvantage is even starker for minority students, who tend to suffer  
5 from the “digital divide” and from a lack of access to childcare. The digital divide  
6 refers to the lack of access to technology that affects minority populations. *See*  
7 Robert W. Fairlie, *Race and the Digital Divide*, UC Santa Cruz: Department of  
8 Economics, UCSC, at 2 (2014).<sup>5</sup> Studies show that “Blacks and Latinos are  
9 substantially less likely to have a computer at home than are white, non-Latinos,”  
10 with some estimates showing that “70.4 percent of whites have access to a home  
11 computer” while “only 41.3 percent of blacks and 38.8 percent of Latinos have access  
12 to a home computer.” *Id.* at 4–5. And low-income families “have trouble finding,  
13 accessing, and affording” childcare. *Coronavirus Impact on Students and Education*  
14 *Systems*, NAACP (last visited July 28, 2020).<sup>6</sup> Indeed, the McKinsey study predicted  
15 that Blacks and Latinos would suffer a 15 to 20 percent greater loss in educational  
16 gains than other students. Dorn, *supra*. The CDC reports that students with  
17 disabilities also “had significant difficulties with remote learning.” *The Importance of*  
18 *Reopening America’s Schools this Fall*, Centers for Disease Control and Prevention  
19 (July 23, 2020).<sup>7</sup>

20 The problems of remote education—especially for poor, minority, and disabled  
21 children—surfaced almost immediately upon California schools’ transition to online-  
22 only learning. Less than two weeks after the school shutdown on March 16, 2020,  
23 Los Angeles School District officials admitted that 15,000 high-school students were  
24

---

25 <sup>4</sup> Available as of the date of filing: [https://www.mckinsey.com/industries/public-](https://www.mckinsey.com/industries/public-sector/our-insights/covid-19-and-student-learning-in-the-united-states-the-hurt-could-last-a-lifetime)  
26 [sector/our-insights/covid-19-and-student-learning-in-the-united-states-the-hurt-could-](https://www.mckinsey.com/industries/public-sector/our-insights/covid-19-and-student-learning-in-the-united-states-the-hurt-could-last-a-lifetime)  
27 [last-a-lifetime](https://www.mckinsey.com/industries/public-sector/our-insights/covid-19-and-student-learning-in-the-united-states-the-hurt-could-last-a-lifetime).

27 <sup>5</sup> Available as of the date of filing: <https://escholarship.org/uc/item/48h8h99w>.

28 <sup>6</sup> Available as of the date of filing: [https://naacp.org/coronavirus/coronavirus-impact-](https://naacp.org/coronavirus/coronavirus-impact-on-students-and-education-systems/)  
[on-students-and-education-systems/](https://naacp.org/coronavirus/coronavirus-impact-on-students-and-education-systems/).

<sup>7</sup> Available as of the date of filing: [https://www.cdc.gov/coronavirus/2019-](https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/reopening-schools.html)  
[ncov/community/schools-childcare/reopening-schools.html](https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/reopening-schools.html).

1 completely unaccounted for and more than 40,000 had not been in daily contact with  
2 their teachers. Howard Blume, *15,000 L.A. high school students are AWOL online,*  
3 *40,000 fail to check in daily amid coronavirus closures*, Los Angeles Times (March  
4 30, 2020).<sup>8</sup> As one teacher explained, during the lockdown, her fifth grade online  
5 math class, consisting primarily of poor and minority students, had only a 10%  
6 attendance rating. Keech Decl. ¶¶ 7, 15. Another explained that, even high-achieving,  
7 affluent students, “struggled with online learning at home” and “missed the important  
8 social interactions with their friends.” Gerst Decl. ¶ 5. Yet another saw her students’  
9 online participation rate start at only 42% at the beginning of the closure and drop to  
10 a mere 2% by the end of the school year. Cunningham Decl. ¶ 5.

11 Later studies showed even more starkly how much students suffered  
12 academically from online-only learning. A July 7 study conducted by the Los  
13 Angeles Unified School District (LAUSD) showed that, between March 16 and May  
14 22, 2020, “on an average day only about 36% of middle and high school students  
15 participated online,” while “[a]bout 25% logged on or viewed work only” “[a]nd  
16 about 40% were absent.” *Report reveals disparities among Black, Latino LAUSD*  
17 *students in online learning amid COVID-19 pandemic*, ABC 7 Eyewitness News  
18 (July 17, 2020).<sup>9</sup> A survey of parents in the Palos Verde Unified School District  
19 showed that over 60% of parents reported that the amount of “face-to-face” teaching  
20 during the shutdown was “not enough.” Brach Decl. ¶ 15.

21 Minority and disabled students suffered even more from online-only learning.  
22 The July 7 study by the LAUSD found that “Black and Latino students showed  
23 participation rates between 10 and 20 percentage points lower than white and Asian  
24 peers.” ABC 7, *supra*. And “English learners, students with disabilities, homeless  
25 students and those in the foster-care system had lower rates of online participation.”  
26 *Id.* As one special-education teacher explained, of the 795,000 disabled students in

27 \_\_\_\_\_  
28 <sup>8</sup> Available as of the date of filing: <https://www.latimes.com/california/story/2020-03-30/coronavirus-los-angeles-schools-15000-high-school-students-absent>.

<sup>9</sup> Available as of the date of filing: <https://abc7.com/lausd-los-angeles-unified-school-district-race-disparity-racial-divide/6321930/>.

1 California’s schools, “[w]hen school campuses are closed and education is moved  
2 entirely online, many of the guarantees and tenets afforded to special needs children  
3 under the Individuals with Disabilities Education Act (‘IDEA’) collapse.” Walker  
4 Decl. ¶¶ 4–5. Indeed, “[m]any students with special needs . . . have a myriad of health  
5 needs that require services,” including assistance with “eating, balancing, etc.,” which  
6 “simply cannot be provided virtually.” *Id.* ¶ 7; *see also* Reardon Decl. ¶ 10 (“Autistic  
7 children require a tremendous amount of direct support,” including for “their  
8 developmental, speech, occupational therapy, behavior (i.e., social skills), and  
9 academic needs.”). “One survey found that 4 out of 10 families reported that they  
10 were not receiving any special education support at all,” and only “1 in 5 families  
11 reported that they are receiving all the services their children are entitled to on their  
12 [Individualized Education Program].” Walker Decl. ¶ 9.

13 Beyond these overwhelming difficulties, a complete lack of access to schools  
14 caused students—especially poor, minority, and disabled students—to suffer myriad  
15 other traumas. As the CDC explained, “[s]chools play a critical role in supporting the  
16 whole child, not just their academic achievement,” including the “development of  
17 social and emotional skills.” *The Importance of Reopening America’s Schools, supra.*  
18 “Psychological, social, and emotional development requires children to both spend  
19 time away from parents and with peers, in structured settings, such as school.”  
20 McDonald Decl. ¶ 7. “Peer relationships provide a unique context in which children  
21 learn a range of critical social emotional skills, such as empathy, cooperation, and  
22 problem-solving strategies.” Lyons-Weiler Decl. ¶ 25. And the safe, connected  
23 environment many students experience at school reduces students’ depression,  
24 anxiety, and thoughts of suicide, *The Importance of Reopening America’s Schools,*  
25 *supra*, while “extended periods of confinement” increase these problems, McDonald  
26 Decl. ¶ 7; *see also* Lyons-Weiler Decl. ¶ 29 (“we may also expect to observe  
27 increased incidence of acting-out behaviors as children try to cope with the  
28 psychosocial effects not only of isolation but also fear of the unknown”). Indeed, one  
psychiatrist has seen children “with cognitive developmental delays like autism”

1 “regress[ ] in years” from the closures, “and many have become violent towards  
2 themselves and their parents.” McDonald Decl. ¶ 7. One teach reported that “[m]any  
3 of her students expressed ... a marked increase in feelings of depression, isolation,  
4 and anxiety.” Cunningham Decl. ¶ 8. For two students, the impact was so severe that  
5 “they were having difficulty getting out of bed in the morning.” *Id.* Plaintiff  
6 Mitrowke’s 7-year-old son is so emotionally affected by the closures that she  
7 frequently hears him cry in the shower because he misses his friends, and he  
8 continues to suffer daily from the isolation. Mitrowke Decl. ¶¶ 2, 5–6. Boiled down  
9 to its essence, the Governor’s mandate will harm children by denying them of the  
10 necessary social interactions required to develop emotionally, psychologically, and  
11 spiritually. Giap Decl. ¶ 3.

12 Additionally, as the American Academy of Pediatrics explained, “[l]engthy  
13 time away from school and associated interruption of supportive services often  
14 results in isolation, making it difficult for schools to identify and address important  
15 learning deficits as well as child and adolescent physical or sexual abuse, substance  
16 use, depression, and suicidal ideation.” *COVID-19 Planning Considerations:  
17 Guidance for School Re-entry*, American Academy of Pediatrics (last visited July 28,  
18 2020) (hereinafter AAP Guidance);<sup>10</sup> *see also* Victory Decl. ¶ 6 (“children’s hearing  
19 and vision problems are typically identified at school”). Indeed, teachers and staff  
20 report more than one-fifth of all child-abuse cases. *The Importance of Reopening  
21 America’s Schools, supra*. During the school closures, “there has been a sharp decline  
22 in reports of suspected maltreatment.” *Id.*; *see also* Victory Decl. ¶ 6 (30% drop in  
23 nationwide abuse reports). However, hospitals have seen an *increase* in  
24 hospitalizations of children suffering physical abuse. *The Importance of Reopening  
25 America’s Schools, supra*. And according to the Rape, Abuse & Incest National  
26 Network (RAINN), once shelter-in-place orders were implemented “half the victims  
27 receiving help from the National Sexual Assault Hotline were minors.” *For the First*  
28

---

<sup>10</sup> Available as of the date of filing: <https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/reopening-schools.html>.

1 *Time Ever, Minors Make Up Half of Visitors to National Sexual Assault Hotline,*  
2 RAINN (April 16, 2020). “Many minors are now quarantined at home with their  
3 abuser” while being “cut off from their safety net – the teachers, coaches, and  
4 friends’ parents who are most likely to notice and report suspected abuse.” *Id.*

5 Finally, students have been cut off from an important source of food and  
6 physical activity. The CDC reports that “more than 30 million children participate in  
7 the National School Lunch Program and nearly 15 million participate in the School  
8 Breakfast Program.” *The Importance of Reopening America’s Schools, supra.* And  
9 the AAP explains that “[b]eyond the educational impact and social impact of school  
10 closures, there has been substantial impact on food security and physical activity for  
11 children and families.” AAP Guidance.

12 **II. The Data Show that Children Are Unlikely to Spread the Coronavirus**  
13 **or Suffer Adverse Results from COVID-19, and Many European**  
14 **Schools Reopened Without Causing a Resurgence of Coronavirus**

15 Despite the enormous consequences of the COVID-19 pandemic, “the direct  
16 daily toll from infection has generally decreased throughout the United States,”  
17 including “in the state of California.” Atlas Decl. at ¶ 8. In California, “the stated  
18 goal of societal lockdown—avoiding hospital overcrowding in in-patient and ICU  
19 bed occupancy—has been accomplished. Indeed, as of July 24, 2020, the latest data,  
20 the hospital bed occupancy by COVID-19 patients in California is only about 11  
21 percent.” *Id.* “[E]xtensive evidence,” moreover, “all suggest that the overall fatality  
22 rate is far lower than early estimates, likely below 0.1 to 0.4%.” *Id.* ¶ 9. The most  
23 recent studies “indicate that the fatality rate for those under age 70 is 0.04%, less than  
24 or equal to seasonal influenza.” *Id.*

25 Of particular importance and relevance here, “younger, healthier people have  
26 *virtually zero* risk of death from [COVID-19].” *Id.* ¶ 11. “No child under age 18 in  
27 the state of California has died due to infection from the coronavirus since tracking  
28 began on February 1, 2020...[u]nlike the seasonal flu, which kills approximately 200  
children per year nationally.” McDonald Decl. at ¶ 5. “[L]iterally, zero deaths[ ] have



1 occurred in people under 18,” while “0.01 percent of deaths occurred in people under  
2 25 years of age” and “only 6.8% of deaths have occurred in people under 49 years of  
3 age.” Atlas Decl. ¶ 11. These rates are the same around the world, including from  
4 “South Korea [that has] reported zero deaths for children 0 to 20—the same rate  
5 indicated by data from Italy.” Lyons-Weiler Decl. ¶ 6. It is not just fatalities that are  
6 eluding younger people. “Younger, healthier people likewise have virtually no risk of  
7 serious illness from COVID-19.” Atlas Decl. ¶ 11. This is a crucial consideration  
8 here because “teaching is generally a relatively young profession”—more than “[h]alf  
9 of K-12 teachers are 41 or younger” and “81% are under 55.” *Id.* ¶ 17; Victory Decl.  
10 ¶ 9.

11 “Scientists now believe children may be largely immune to SARS-CoV-2  
12 infection.” Lyons-Weiler Decl. ¶ 7. For this reason, “[c]hildren are essentially at zero  
13 risk of contracting COVID-19 or becoming ill from the virus if schools were to  
14 reopen.” Victory Decl. ¶ 4. The “data reported in a May JAMA Pediatrics study flatly  
15 stated that ‘children are at far greater risk of critical illness from influenza than from  
16 COVID-19.’” Atlas Decl. ¶ 12 (citing study). Even the “CDC concluded that children  
17 who become infected are [ ] ‘far less likely to suffer severe symptoms.’” *Id.* ¶ 13  
18 (citing July 2020 CDC study). Underscoring this low risk, “Dr. Anthony Fauci ... has  
19 reported that children are unlikely to be among the first individuals to receive any  
20 COVID-19 vaccine found to be safe and effective” while also “suggest[ing] that it  
21 would be appropriate to re-open schools.” Lyons-Weiler Decl. ¶ 9.

22 Transmission rates among children and their supervisors are also nominal.  
23 “[C]hildren are unlikely to be a vector” of COVID 19, Victory Decl. ¶ 5, meaning  
24 they “do not pose a severe risk of transmission to adults.” Lyons-Weiler Decl. ¶ 4.  
25 “Scientific studies from all over the world [ ] suggest that COVID-19 transmission  
26 among children in schools is low.” Atlas Decl. ¶ 15. For example, the “CDC has  
27 published a report on the age distribution of transmission to new cases in South  
28 Korea, which found that less than 1% of new transmission detected in the study were  
attributed to children aged 0 to 10 years; similarly, less than 1% of new transmissions

1 were from children aged 11 to 20 years.” Lyons-Weiler Decl. at ¶ 14. Presently, there  
2 are “22 countries that have their schools open without social distancing, mask  
3 wearing, and other measures, yet these countries have not experienced an increase in  
4 COVID-19 cases or spread of the virus among children.” Victory Decl. ¶ 8;  
5 McDonald Decl. ¶ 6. Importantly, “these countries have not seen transmission of the  
6 virus between children and their parents or elderly grandparents.” Victory Decl. ¶ 8.  
7 On the contrary, one July 2020 study from the University of Dresden concluded that  
8 “children appeared to act as a barrier to transmission.” McDonald Decl. ¶ 6. Thus, it  
9 is “abundantly clear that children under twelve years of age are not transmitting in  
10 schools.” Lyons-Weiler Decl. ¶ 23.

11 **III. In Light of This Evidence, School Districts in California Begin**  
12 **Preparing to Reopen Safely for the 2020-21 School Year**

13 In light of the obvious deficiencies of remote learning and the low risk of  
14 coronavirus infection among children, teachers have diligently prepared since spring  
15 to return to schools. In Palos Verdes, for example, home to approximately 11,000  
16 students, the school district established a reopening committee comprised of 40 staff  
17 members, 45 medical professionals, 30 elementary parents, and 39 high school  
18 parents. Brach Decl. ¶¶ 5, 10. This district also purchased and implemented a  
19 personal protective equipment and mitigation strategy, including such tactics as  
20 staggered time arrivals, designated entrance and exit routes, masks or face shields for  
21 teachers and students, and hand sanitizing stations. *Id.* ¶ 12; *see also* Reardon Decl. ¶¶  
22 8–9 (describing Capistrano Unified School District encompassing 48,000 students  
23 plans to reopen). These mitigation strategies are consistent with “commonly accepted  
24 public health definitions of safe operating that minimize [health] risks” in schools.  
25 Kaufman Decl. ¶ 16. A survey in Palos Verdes also found that an “overwhelming  
26 amount (65%) of parents” supported returning the students to school. Brach ¶ 13.  
27 Parents who had taken off from work to watch over their children had planned to  
28 return to work both because of the benefits “in-person instruction” provides and the  
“financial[ ]” toll missing work has imposed. Hackett Decl. ¶ 8; Petrilla Decl. ¶¶ 8–9;



1 Beaulieu Decl. ¶ 6. Parents of disabled children who took time from work especially  
2 looked forward to schools reopening, because “disabilities [ ] make it extremely  
3 difficult” to learn at home without special assistance afforded by in-person  
4 instruction. Gavin Decl. ¶¶ 9–10; *see* Walker Decl. ¶10 (“Schools are the best venues  
5 to provide students with their legally mandated special services.”).

6 **IV. The California Department of Public Health Orders All Schools to**  
7 **Remain Closed, Except for Schools in a Small Number of Counties**

8 On July 17, 2020 Newsom announced a framework for reopening schools.  
9 Atlas Decl. ¶ 7. Under his plan, reopening hinges on not being on the county  
10 monitoring list for two weeks. *Id.* (“Schools and school districts may reopen for in-  
11 person instruction at any time if they are located in a local health jurisdiction (LHJ)  
12 that has not been on the county monitoring list within the prior 14 days.”).<sup>11</sup> “The  
13 state places a county on this list if it meets at least one of six criteria related to the  
14 number of COVID-19 PCR tests conducted or positivity rate, number of cases and  
15 growth in cases, growth in hospitalizations, or inadequate hospital ICU or ventilator  
16 capacity.” *See COVID-19 Update Guidance: Child Care Programs and Providers*,  
17 Cal. Dep’t of Pub. Health (July 17, 2020);<sup>12</sup> *see also* Bhattacharya Decl. ¶ 20.  
18 However, “[n]one of these criteria are related to the risks to children or to teachers  
19 that arise from reopening schools for in-person teaching.” *Id.*  
20  
21  
22

23 \_\_\_\_\_  
24 <sup>11</sup> The plan also includes the following waiver procedure, which permits a local health  
25 officer to waive the reopening limitations if a waiver “is requested by the  
26 superintendent (or equivalent for charter or private schools.” *COVID-19 and*  
27 *Reopening In-Person Learning Framework for K-12 Schools in California, 2020-2021*  
28 *School Year*, State of Cal., Dept. of Pub. Health, (July 17, 2020). The health officer  
must “consult with CDPH when considering a waiver request.” *Id.*, available at:  
<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/COVID-19/Schools%20Reopening%20Recommendations.pdf>.

<sup>12</sup> Available as of the date of filing: <https://files.covid19.ca.gov/pdf/guidance-childcare--en.pdf>.

1 The most important evidence on childhood spread of the disease comes from a  
2 study conducted in Iceland and published in the New England Journal of Medicine.<sup>13</sup>  
3 The data for this study comes from Iceland’s systematic screening of its population to  
4 check for the virus. The study reports on both a population-representative sample and  
5 a sample of people who were tested because of the presence of symptoms consistent  
6 with COVID-19 infection. The study team isolated SARS-CoV-2 virus samples from  
7 every positive case, sequenced the genome of the virus for every case, and tracked  
8 the mutation patterns in the virus. This analysis, along with contact tracing data,  
9 allowed the study team to identify who passed the virus to whom. From this analysis,  
10 the senior author of the study, Dr. Kari Stefansson, concluded<sup>10</sup> that “[E]ven if  
11 children do get infected, they are less likely to transmit the disease to others than  
12 adults. We have not found a single instance of a child infecting parents. There is  
13 amazing diversity in the way in which we react to the virus.”

14 Nor is it true “that there is no way to safely operate as a school in a county that  
15 meets the state’s criteria for placement in the ‘monitoring list.’” Kaufman Decl. ¶ 16.  
16 Indeed, other, similar operations are permitted in counties on the monitoring list,  
17 including childcare facilities and day camps. *See COVID-19 Update Guidance: Child*  
18 *Care Programs and Providers*, Cal. Dep’t of Pub. Health (July 17, 2020);<sup>14</sup> *COVID-*  
19 *19 Interim Guidance: Day Camps*, Cal. Dep’t of Pub. Health (July 17, 2020).<sup>15</sup>

20 California is the only state in the U.S. that is mandating at the state level that  
21 school districts not hold in-person classes, affecting millions of students, rather than  
22  
23  
24

---

25  
26 <sup>13</sup> Daniel F. Gudbjartsson, Ph.D., Agnar Helgason, Ph.D., et al., *Spread of SARS-CoV-*  
27 *2 in the Icelandic Population*, The New England Journal of Medicine,  
28 <https://www.nejm.org/doi/full/10.1056/NEJMoa2006100> (June 11, 2020).

<sup>14</sup> Available as of the date of filing: <https://files.covid19.ca.gov/pdf/guidance-childcare--en.pdf>.

<sup>15</sup> Available as of the date of filing: <https://files.covid19.ca.gov/pdf/guidance-daycamps.pdf>.

1 leave that decision to the individual school district. There are currently 5.9 million  
2 students K-12 in California.<sup>16</sup>

3 **V. Plaintiffs Have Been and Will Continue to be Harmed by the**  
4 **Governor’s Mandatory School Closures**

5 Plaintiffs are a student and several parents of students adversely impacted by  
6 the school closures. Ms. Sephton, for example, has two children, one of whom is a  
7 toddler and the other a four-year-old. Sephton Decl. ¶¶ 2–3. Since she must take care  
8 of her toddler during the day, “distance learning mode is really no education at all”  
9 for her oldest child. *Id.* ¶ 5. Ms. Walsh faces a similar situation with two children.  
10 “[W]hen the school was shut down and education was moved to distance learning,  
11 what was provided was not learning in any sense of the word.” Walsh Decl. ¶ 4. Ms.  
12 Ruiz is the mother of two sons who have special needs. “Since school was shut  
13 down,” her son has “not been provided with any of his services that are required by  
14 his [individualized education program].” Ruiz Decl. ¶ 5. Moreover, like many other  
15 similarly situated children, “[d]ue to his disabilities, ZOOM classes are a useless  
16 form of education.” *Id.* ¶ 6. Even children without special needs are dropping basic  
17 skills as Mr. Ziegler attests. “As a result of [his] daughter’s school moving to  
18 distance-learning, [he] witnessed [his] daughter ... fall[ ] behind in schooling.”  
19 Ziegler Decl. ¶ 3. Ms. Beaulieu experienced the same. For her, it was “extremely  
20 concerning that [her] son received no Zoom instruction at all from his math teacher  
21 the entire time that the school was closed.” Beaulieu Decl. ¶ 8. In addition to  
22 academic shortfalls, unnecessary distance learning has caused “behavioral issues” for  
23 Mr. Petrilla’s young boy. Petrilla Decl. ¶ 6. Mr. Fleming’s daughter “has worked  
24 tirelessly to ... attend her dream college” but may now miss out because of the  
25 negative impact on her grades and lost scholarship opportunities. Fleming Decl. ¶ 11.

26 All of this is unnecessary because, as explained by Mr. Hackett, some schools  
27 “are going above and beyond” by making “huge investments of effort and money to  
28

---

<sup>16</sup> Available as of the date of filing:  
<https://lao.ca.gov/Education/EdBudget/Details/331>.

1 comply with the CDC and health directives” to ensure a safe learning environment.  
2 Hackett Decl. ¶ 6. This is especially true for Mr. Brach who is a member of the Board  
3 of Palos Verdes Unified School District. In addition to witnessing his daughter’s  
4 “mental health issues” as a result of “isolation,” he has participated with other board  
5 members in equipping Palos Verde Unified School District with the necessary  
6 “mitigation strategies” to open safely and effectively. Brach Decl. ¶¶ 7, 12. There is  
7 therefore no legitimate reason for his daughter and many others like her to be  
8 excluded from in-person instruction.

9 California is the *only* state in America with state-level mandates prohibiting  
10 school districts from hold in-person classes. Atlas Decl. ¶7. Governor Newsom’s  
11 Order impacts millions of students, from kindergarten through high school, yet the  
12 State has absolutely no scientific basis for closing schools this fall. *Id.*; *see also*,  
13 Bhattacharya Decl. ¶15.

#### 14 LEGAL STANDARD

15 “A plaintiff seeking a preliminary injunction must establish that he is likely to  
16 succeed on the merits, that he is likely to suffer irreparable harm in the absence of  
17 preliminary relief, that the balance of equities tips in his favor, and that an injunction  
18 is in the public interest.” *Winter v. Natural Res. Def. Council, Inc.*, 555 U.S. 7, 20  
19 (2008) (citations omitted). Plaintiffs need not show that they will prevail at trial, but  
20 only that they are “likely” to prevail. *See id.*; *Leiva-Perez v. Holder*, 640 F.3d 962,  
21 966 (9th Cir. 2011). Alternatively, under the so-called sliding scale approach, as long  
22 as the plaintiff demonstrates the requisite likelihood of irreparable harm and shows  
23 that an injunction is in the public interest, a preliminary injunction can still issue so  
24 long as serious questions going to the merits are raised and the balance of hardships  
25 tips sharply in the plaintiffs favor. *Alliance for the Wild Rockies v. Cottrell*, 632 F.3d  
26 1127, 1134–35 (9th Cir. 2011). A “serious question” is one on which the movant “has  
27 a fair chance of success on the merits.” *Sierra On-Line, Inc. v. Phoenix Software,*  
28 *Inc.*, 739 F.2d 1415, 1421 (9th Cir. 1984) (internal quotation marks and citation  
omitted).

1 **ARGUMENT**

2 **I. THERE IS A STRONG LIKELIHOOD THAT PLAINTIFFS WILL**  
3 **SUCCEED ON THE MERITS**

4 **A. Defendants’ Orders Banning In-Person Instruction at Every School**  
5 **on the State’s Monitoring List Violate the Fourteenth Amendment’s**  
6 **Due Process and Equal Protection Clauses.**

7 To determine whether a government act violates the substantive component of  
8 the Due Process Clause or the Equal Protection Clause, courts begin “by determining  
9 the proper level of scrutiny to apply for review.” *Wright v. Incline Vill. Gen.*  
10 *Improvement Dist.*, 665 F.3d 1128, 1141 (9th Cir. 2011). “[Courts] apply strict  
11 scrutiny if the governmental enactment ‘targets a suspect class or burdens the  
12 exercise of a fundamental right.’ *Id.* An act passes strict scrutiny only if it “is  
13 narrowly tailored to serve a compelling governmental interest.” *Id.* “If the [act] does  
14 not concern a suspect or semi-suspect class or a fundamental right, [courts] apply  
15 rational basis review and simply ask whether the ordinance is rationally-related to a  
16 legitimate governmental interest.” *Id.* (citation omitted)

17 **1. The Orders Infringe Californians’ Fundamental Right to Education,**  
18 **Failing Strict Scrutiny**

19 **a. The School Closure Orders Implicate the Substantive-Due-**  
20 **Process Right to Education, Which is Deeply Rooted in Our**  
21 **History and Jurisprudence**

22 The Due Process Clause protects substantive rights not expressly enumerated  
23 within the Bill of Rights. *See, e.g., Obergefell v. Hodges*, 135 S. Ct. 2584, 2587  
24 (2015); *Roe v. Wade*, 410 U.S. 113, 152-53 (1973). In particular, “the Due Process  
25 Clause specially protects those fundamental rights and liberties which are,  
26 objectively, deeply rooted in this Nation’s history and tradition, and implicit in the  
27 concept of ordered liberty, such that neither liberty nor justice would exist if they  
28 were sacrificed.” *Glucksberg*, 521 U.S. at 720–21 (internal citations and quotation  
marks omitted). Courts must “exercise reasoned judgment in identifying interests of  
the person so fundamental that the State must accord them its respect”; “[h]istory and

1 tradition guide and discipline this inquiry but do not set its outer boundaries.”

2 *Obergefell*, 135 S. Ct. at 2598 (quoting *Poe v. Ullman*, 367 U.S. 497, 542 (1961)  
3 (Harlan, J., dissenting)).

4 Historical analysis confirms that, although the Supreme Court has not (yet) so  
5 held, the right to a basic education is “deeply rooted in this Nation’s history and  
6 tradition,” stretching back at least as far as ratification of the Fourteenth Amendment.

7 Indeed, more than three-quarters of States recognized an affirmative right to public  
8 school education in 1868, the year that the Fourteenth Amendment was ratified.

9 Steven G. Calabresi & Michael W. Perl, *Originalism and Brown v. Board of*  
10 *Education*, 2014 Mich. St. L. Rev. 429, 449–63 (cataloging State constitutional  
11 provisions as of 1868). In particular, 30 states (*i.e.*, 81% of the states at the time) had  
12 a constitution that “said explicitly that the state legislature ‘shall’ (*i.e.*, it has the

13 ‘duty’ and therefore it ‘must’) establish a system of free public schools.” Calabresi &  
14 Perl, 2014 Mich. St. L. Rev. at 451–54 (listing these 30 states and quoting their

15 constitutional provisions). Another three states’ constitutions “arguably conferred a  
16 right to a free public education,” whereas only four “states’ constitutions in 1868 did  
17 not specifically mention education or the establishment of a system of free public

18 schools.” *Id.* at 455–60. It is thus “as clear as day that there was a[ ] . . . consensus of  
19 three-quarters of the states in 1868 that recognized that children have a fundamental  
20 right to a free public school education.” *Id.* at 460; compare *McDonald v. City of*  
21 *Chicago*, 561 U.S. 742, 777–78 (2010) (plurality opinion) (reviewing same sources).

22 That proportion is significant because “Article V of the federal Constitution  
23 requires a three-quarters consensus of the states to amend the Constitution.” *Id.* at  
24 443. So, “an Article V consensus of three-quarters of the states in 1868 should be  
25 sufficient for establishing that a right is ‘fundamental,’ since it would be sufficient for  
26 approval of a constitutional amendment.” *Id.* at 444. In other words, commonplace  
27 state constitutional recognition at the time of ratification “objectively” establishes the  
28 fundamental nature of this right. *Glucksberg*, 521 U.S. at 720–21. It also



1 distinguishes it from other important social benefits that a supermajority of states had  
2 not committed to provide by 1868.

3 It is also clear that State-provided or -permitted education is “implicit in the  
4 concept of ordered liberty, such that neither liberty nor justice would exist if they  
5 were sacrificed.” *Glucksberg*, 521 U.S. at 720–21 (internal quotation marks omitted).  
6 To begin with, the foundation of American liberty is our *written* Constitution, under  
7 which laws must be published in *writing* before they may be executed to constrain  
8 liberty. *See* U.S. Const. art. I §§ 9–10 (prohibiting the enactment of any “ex post  
9 facto law” by Congress or state legislatures). Thus, texts lie at the heart of our  
10 ordered liberty—and neither liberty nor justice as those concepts are conceived in the  
11 American tradition would exist without a shared capacity to decode our governing  
12 texts through basic literacy and other skills instilled through in-person schooling.

13 Basic learning is also a prerequisite for the activities that form the basis of  
14 citizenship in our republic. For example, reading, writing, and math skills are critical  
15 to participation in the political process, including “knowledgeable and informed  
16 voting,” comprehending ballot initiatives, and engaging in political speech and  
17 discourse. *See also Citizens United v. FEC*, 558 U.S. 310, 339–40 (2010); *Bd. of*  
18 *Educ. v. Pico*, 457 U.S. 853, 866–67 (1982) (“[T]he Constitution protects the right to  
19 receive information and ideas.” (internal quotation marks omitted)). Literacy skills  
20 are also necessary to engage in activities of citizenship, such as enlisting in military  
21 service, obtaining government entitlements, and “comply[ing] with mandatory  
22 government requirements such as filing tax forms or selective service registration.”  
23 And lack of basic reading and writing skills precludes individuals from  
24 constitutionally protected access to the justice system. *Id.*; *see also, e.g., Griffin v.*  
25 *Illinois*, 351 U.S. 12, 19–20 (1956); *Boddie v. Connecticut*, 401 U.S. 371, 382–83  
26 (1971).

27 The necessity of education to ordered liberty explains why public, state-  
28 provided learning has such deep roots in our nation’s history. In the words of  
Professors Calabresi and Perl, “[a]t a minimum, children must be taught to read so

1 they can read the laws for themselves—a task that many of the Framers would have  
2 thought was fundamental.” Calabresi & Perl, 2014 Mich. State L. Rev. at 552.  
3 Indeed, education has been singled out for unique treatment among state activities.  
4 For a century, every single state has had compulsory education laws. Friedman &  
5 Solow, 81 Geo. Wash. L. Rev. at 127 (“By 1918, education was compulsory in every  
6 state of the union.”). In other words, children throughout California and the nation are  
7 compelled to attend school full time (or be home-schooled) under penalty of fines and  
8 jail time. *See* Gershon M. Ratner, A New Legal Duty for Urban Public Schools:  
9 Effective Education in Basic Skills, 63 Tex. L. Rev. 777, 823 (1985).

10 History and practice make clear that this deprivation of the liberty that children  
11 and their families otherwise would have to pursue activities of their own choosing is  
12 justified by the unique importance of education. As the Supreme Court explained in  
13 *Brown v. Board of Education*, “education is [ ] the most important function of state  
14 and local governments,” as demonstrated by our “[c]ompulsory school attendance  
15 laws and the great expenditures for education.” 347 U.S. at 493; *see also Meyer v.*  
16 *Nebraska*, 262 U.S. 390, 400 (1923) (“The American people have always regarded  
17 education and acquisition of knowledge as matters of supreme importance which  
18 should be diligently promoted.”). Indeed, so crucial is education to ordered liberty  
19 that courts require that procedural due process be afforded not when children are  
20 confined to school—but when children are expelled or suspended from school, and  
21 thus deprived of their interest in a state-sponsored education. *Goss v. Lopez*, 419 U.S.  
22 565, 579 (1975) (“[S]tudents facing suspension and the consequent interference with  
23 a protected property interest must be given some kind of notice and afforded some  
24 kind of hearing...to avoid unfair or mistaken exclusion from the educational process,  
25 with all of its unfortunate consequences.”).

26 And while, of course, the Supreme Court has not yet squarely held that there is  
27 a fundamental right to education, it has sent powerful signals that it is willing to do so  
28 in the right case. Rejecting a constitutional challenge to a state’s school-financing  
system, the Court in *San Antonio Independent School District v. Rodriguez*, 411 U.S.



1 1 (1973), nonetheless made explicit that the case before it did *not* present the question  
2 of whether there is a fundamental right to “some identifiable quantum of education”  
3 sufficient to provide children with the “basic minimal skills necessary for the  
4 enjoyment of the rights of speech and of full participation in the political process.” *Id.*  
5 at 36–37. And the Court underscored that if a “class of ‘poor’ people” were  
6 “absolutely precluded from receiving an education[, t]hat case would present a far  
7 more compelling set of circumstances for judicial assistance than the case before” it.  
8 *Id.* at 25 n.60. Later, the Court wrote that “[a]s *Rodriguez* and *Plyler* indicate, this  
9 Court has not yet definitively settled the question[] whether a minimally adequate  
10 education is a fundamental right.” *Papasan v. Allain*, 478 U.S. 265, 285 (1986);  
11 *accord Kadrmas v. Dickinson Pub. Sch.*, 487 U.S. 450, 466 n.1 (1988) (Marshall, J.,  
12 dissenting) (noting that the issue “remains open today”).

13 **b. Barring Access to Schools, Which Has Devastating**  
14 **Consequences, Plainly Burdens the Fundamental Right to Adequate**  
15 **Education**

16 Prohibiting access to schools burdens a fundamental right to adequate  
17 education. In *Plyer v. Doe*, under Texas law, immigrant children who could not  
18 establish that they had been legally admitted into the United States were denied a free  
19 education in public schools and could attend only if they could afford to “pay a ‘full  
20 tuition fee’ in order to enroll.” 457 U.S. 202, 206 & n.2 (1982). Because many could  
21 not afford to pay tuition, the law amounted in practice to the “exclusion” by the state  
22 of “children from its public schools.” *Id.* at 208. In the Court’s words, “[b]y denying  
23 these children a basic education, we deny them the ability to live within the structure  
24 of our civic institutions, and foreclose any realistic possibility that they will  
25 contribute in even the smallest way to the progress of our nation.” This result could  
26 not be reconciled with the Constitution.

27 Like Texas in *Plyer*, California here is functionally excluding Plaintiffs—  
28 including minority children and families of limited economic means—from the  
opportunity to attain an education. Even worse, unlike in *Plyer*, the schoolhouse  
doors are not even open to Plaintiffs. California hopes that digital learning will

1 provide an equivalent basic minimum education, but this is fantasy with no basis in  
2 any evidence. Quite the contrary, the evidence shows that distance learning will  
3 effectively preclude children from receiving a basic minimum education because (1)  
4 many students have no access to the internet, (2) of those who do have digital access  
5 their educations will be significantly impaired, and (3) truancy will run rampant. *See*  
6 *supra* pp. 5-11, 15 (describing evidence showing extreme hardship from online  
7 learning that excludes children from an education).

8 For example, as extensively documented in the supporting declarations, when  
9 school moved online in the spring, classroom participation evaporated. Cunningham  
10 Decl. ¶ 5. “At the beginning of distance learning in March, I had 42% participation  
11 by my students; by the end, I had 4 total students participate, or 2%.” *Id.* The reason:  
12 “Many of my students lacked sufficient access to wifi and computers to be able to  
13 participate in distance learning.” *Id.* This is particularly true in low-income families  
14 and communities of color. “Nearly 50% of low-income families and 42% of families  
15 of color lack sufficient devices at home to access distance learning.” Megan Kuhfeld,  
16 *et al.*, *Project the potential impacts of COVID-19 school closures on academic*  
17 *achievement*, ANNENBERG INSTITUTE AT BROWN UNIVERSITY, at 10 (May 2020).<sup>17</sup>

18 These are not uncommon occurrences. “[T]he closing of schools this last  
19 spring and the conversion from in-class teaching to online instruction turned out to be  
20 an educational failure. Up to one-third of high school students in the Los Angeles  
21 schools system never checked in with their teachers once.” Dr. Hamilton Decl. ¶ 6;  
22 *see also* Keech Decl. ¶ 14 (“[A]ny model of live daily virtual remote instruction ... is  
23 so lacking” that it “largely fails to meet [students’] basic educational needs.”).

24 Nor are the results surprising. Stanford University comprehensively studied the  
25 impact of virtual learning models and concluded that student were behind their in-  
26 person peers to an extent reflecting 180 fewer days of instruction in math and 72  
27 fewer days of instruction in reading. *Id.* (attaching study). This study comports with  
28 another recent analysis from Brown University in which the researchers concluded

---

<sup>17</sup> Available as of the day of filing: <https://www.edworkingpapers.com/ai20-226>.

1 that “many teachers have had no contact at all with a significant portion of students  
2 ... only 39% of teachers reported interacting with their students at last once a day,  
3 and most teacher-student communication occurred over email.” Megan Kuhfeld,  
4 *supra* p. 12, at 9. And this says nothing of those children requiring special education.  
5 “When school campuses are closed and education is moved entirely online, many of  
6 the guarantees and key tenants afforded to special needs children” under normal  
7 circumstances “collapse.” Walker Decl. ¶ 5; *see also* Reardon Decl. ¶ 10 (“A  
8 prolonged shutdown of schools will have significant negative consequences for  
9 children with special needs and handicapping conditions.”).

10 These declarations and more show what common sense immediately grasps.  
11 Moving in-person instruction to an unaccountable virtual platform that many students  
12 cannot even access functionally forecloses access to a basic minimum education. By  
13 denying Plaintiffs access to schools that offer an opportunity to an education,  
14 Defendants have effectively consigned Plaintiffs and others at their schools to life in  
15 a permanent underclass. Like the students in *Plyler*, Plaintiffs are subject to the  
16 “enduring disability” for lack of education and “[t]he inestimable toll of that  
17 deprivation on [their] social[,] economic, intellectual, and psychological well-being”  
18 that will affect them “each and every day” of their lives.” 457 U.S. at 221–22. The  
19 State, in sum, has burdened a constitutional right.

20 **c. The School Closure Orders Fail Heightened Scrutiny**

21 Because the State is burdening a fundamental right, this Court must apply a  
22 heightened form of scrutiny. *Plyler*, 457 U.S. at 217–18, 223–24. Unlike other  
23 governmental acts that are permissible if they “bear[ ] some fair relationship to a  
24 legitimate public purpose,” *id.* when the State burdens a “substantive component” of  
25 the Fourteenth Amendment, as here, then the act is unconstitutional “unless the  
26 infringement is narrowly tailored to serve a compelling state interest.” *Reno v. Flores*,  
27 507 U.S. 292, 301–02 (1993). For reasons stated above, namely that the weight of  
28 studies shows that children transmission and infection rates cannot justify school  
closures, the government cannot satisfy that test here. *See supra* pp. 11-14

1 (describing evidence that children are unlikely to spread or suffer adverse results  
2 from the coronavirus). The order ignore “the evidence that the mortality risk and  
3 severe adverse health outcome risk to children from COVID-19 disease is small or  
4 negligible.” Bhattacharya Decl. ¶ 20. And they ignore “the fact that children are  
5 exceedingly unlikely to pass the virus on to adults.” Bhattacharya Decl. ¶ 20, 24,  
6 Atlas Decl. ¶ 17-18, 29; and Cincchetti Decl. ¶ 8, 24, 26.

7 More to it, distance learning—when in-person learning is readily available and  
8 safe—is no substitute to providing a basic minimum education. Foremost, and as  
9 noted, many students lack sufficient means to access digital learning. This is  
10 especially true in low-income families and communities of color. *See supra* Kughfeld  
11 at 10. If these same students can study and learn in-person, even on a limited basis  
12 while in school, but are forced to “learn” through a means in which they realistically  
13 cannot access, then the policy is not narrowly tailored. Moreover, numerous studies  
14 show that both the quality and quantity of the education declines precipitously when  
15 forcibly and haphazardly moved online. Consider first the significant involvement of  
16 parents in this environment. “No credible scientist, learning expert, teacher, or parent  
17 believes that children aged 5 to 10 years can meaningfully engage in online learning  
18 without considerable parental involvement, which many families with low incomes  
19 are unable to provides because parents must work outside the home.” Dimitri A.  
20 Christakis, MD, MPH, *School Reopening—The Pandemic Issue That is Not Getting*  
21 *Its Due*, JAMA PEDIATRICS (May 13, 2020).<sup>18</sup>

22 Consider also the social and emotional struggle of children trying to learn on  
23 their own. Many students have “expressed ... a marked increase in feelings of  
24 depression, isolation, and anxiety” as a result of the “school clotures.” Cunningham  
25 Decl. ¶ 8. And the “students most greatly impacted by the shutdown [are] not the  
26 middle and upper class students, but the lower income and minority students who  
27 already suffer from an ever-widening achievement gap.” *Id.* For this reason and  
28

---

<sup>18</sup> Available as of the date of filing:  
<https://jamanetwork.com/journals/jamapediatrics/fullarticle/2766113>.

1 others, child psychologists have sounded the alarm on the mental health risks of  
2 locking down school. Just last month, more than 120 specialists in psychology,  
3 mental health, and neuroscience concluded that school closures are a “national  
4 disaster” because the “impact of the lockdown on learning is incredibly harmful,  
5 creating a huge attainment gap, and the most vulnerable and marginalized in society  
6 ... are likely to be most affected by this.” Professor Ellen Townsend, *et al.*, *Open*  
7 *letter to Gavin Williamson Secretary of State for Education concerning the neglect of*  
8 *children and adolescents in government policy during the UK lockdown.*<sup>19</sup>

9 Studies demonstrate why children need to be physically present in schools.  
10 Late last month the American Academy of Pediatrics “strongly” recommended that  
11 “the coming school year should start with a goal of having students physically  
12 present in school.” American Academy of Pediatrics, *COVID-19 Planning*  
13 *Considerations: Guidance for School Reentry*, ¶ 3 (June 25, 2020).<sup>20</sup> This same  
14 Academy noted the health benefits that would otherwise be lost, such as “child . . .  
15 development,” “social and emotional skills,” “reliable nutrition,” physical/speech and  
16 mental health therapy,” and “opportunities for physical activity” if children are  
17 unnecessarily forced to attend school virtually. *Id.* ¶ 1. This comports with a  
18 recommendation released last week by the Centers for Disease Control. The CDC  
19 detailed crucial characteristics that would be lost if in-person schooling is not held,  
20 including “development of social and emotional skills,” “a safe environment for  
21 learning,” “nutritional needs,” and “physical activity.” *The Importance of Reopening*  
22 *America’s Schools this Fall*, CDC (July 23, 2020).<sup>21</sup>

23 All these significant harms and burdens are avoidable. As seen elsewhere,  
24 many other states have provided options to attend school, including deploying

---

25  
26 <sup>19</sup> Available as of the date of filing: <https://drive.google.com/file/d/1zytNGOtnySoYnyU7iazJUVQ0fS2PC1Z/view>.

27 <sup>20</sup> Available as of the date of filing: <https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/covid-19-planning-considerations-return-to-in-person-education-in-schools/>.

28 <sup>21</sup> Available as of the date of filing: <https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/reopening-schools.html>.

1 “hybrid” models of mixed virtual and in-person learning to reduce student contact.  
2 *See, e.g.,* Gabby Birenbaum and James Bikales, *Here’s your state’s plan for*  
3 *reopening schools*, THE HILL (July 20, 2020).<sup>22</sup> At the very least, other States allow  
4 their school districts or counties to deploy specific plans to address both their student  
5 population’s varying needs and that particular community’s COVID-19 case levels.  
6 More importantly, these localized plans allow schools to prioritize in-person  
7 education for those who are most vulnerable. While remote instruction may play a  
8 role in the various counties’ approaches, there is no reason to adopt a one-size-fits-all  
9 model for the State, and Defendants’ insistence on such an approach fails strict  
10 scrutiny. Because the State cannot possibly show that an all-out exclusion to basic  
11 minimum education is narrowly tailored to protect a compelling government interest,  
12 such a prohibition on accessing schools would fail.

13 **2. Regardless of the Level of Scrutiny, the Orders Violate Equal**  
14 **Protection**

15 “The Equal Protection Clause of the Fourteenth Amendment commands that no  
16 State shall “deny to any person within its jurisdiction the equal protection of the  
17 laws,” which is essentially a direction that all persons similarly situated should be  
18 treated alike.” *Arizona Dream Act Coal. v. Brewer*, 757 F.3d 1053, 1063 (9th Cir.  
19 2014) (quoting *City of Cleburne, Tex. v. Cleburne Living Ctr.*, 473 U.S. 432, 439  
20 (1985)). Where the government unequally infringes on a fundamental right, courts  
21 apply strict scrutiny. *City of Cleburne*, 473 U.S. at 440. Rational basis review applies  
22 when the government enacts discriminatory social or economic legislation. *Id.* The  
23 Supreme Court has also suggested that discrimination affecting “quasi”-fundamental  
24 rights will trigger “intermediate” scrutiny. *Plyler v. Doe*, 457 U.S. 202, 230 (1982)  
25 (applying intermediate scrutiny when evaluating claims for equal access to education  
26 brought by immigrant children unlawfully present in Texas).

27  
28  

---

<sup>22</sup> Available as of the date of filing: <https://thehill.com/homenews/state-watch/508105-heres-your-states-plan-for-reopening-schools>.



1 Here, the Governor’s order and guidance prohibit schools in some counties  
2 from holding in-person classes while allowing schools in other counties to return to  
3 the classroom. The dividing line is whether a school is located within a county on the  
4 state’s monitoring list. Thus, while students in Shasta County can resume in-person  
5 learning this fall, similarly situated students in Los Angeles County, Yolo County,  
6 and 30 other counties cannot. The Governor’s unequal treatment of students in  
7 California cannot survive review under any level of scrutiny.

8 **a. The Orders Fail Heightened Scrutiny Under *Plyler v. Doe***

9 As Plaintiffs have already explained, education is a fundamental right enjoyed  
10 by every child in California. The Governor’s decision to deprive some students of in-  
11 person education, but not others, thus infringes on fundamental rights. The Order are  
12 thus subject to strict scrutiny, which they cannot survive because even assuming that  
13 the state has a compelling interest in slowing the spread of COVID-19, the  
14 Governor’s actions here are not the least restrictive means of furthering that goal.  
15 Indeed, as the declarations filed in this case confirm, closing schools does *nothing* to  
16 advance that goal because children are not at risk from the virus and they do not play  
17 a significant role in transmitting it to others. *See, e.g.*, Dr. Atlas Decl., Dr.  
18 Bhattacharya Decl., Barke Decl., Dr. Victory Decl., Dr. Lyons-Weiler Decl. In other  
19 words, the state’s interest in arresting the spread of COVID-19 could be advanced  
20 just as effectively without closing a single school. Because the Order is not the least  
21 restrictive means of advancing the state’s asserted interest—while depriving millions  
22 of students of their fundamental right to education—the Court should enjoin  
23 Defendants from enforcing them.

24 Even if education is not a “fundamental” right, it is at least a “quasi”  
25 fundamental right subject to intermediate scrutiny. It is well settled that, under *Plyler*  
26 *v. Doe*, “infringements on certain ‘quasi-fundamental’ rights, like access to public  
27 education, also mandate a heightened level of scrutiny.” *United States v. Harding*,  
28 971 F.2d 410, 412 n.1 (9th Cir. 1992). Specifically, such infringements are invalid

1 unless they further an important government interest and do so by means that are  
2 substantially related to that interest.

3 The Order undoubtedly infringe the right to a basic education. Like the law  
4 *Plyler*, the Order will “impose[ ] a lifetime hardship on a discrete class of children  
5 not accountable for their disabling status. The stigma of illiteracy will mark them for  
6 the rest of their lives.” 457 U.S. at 223. “By denying these children a basic  
7 education,” the Order threatens to “deny them the ability to live within the structure  
8 of our civic institutions” and diminish the “possibility that they will contribute . . . to  
9 the progress of our Nation.” *Id.* at 223–24.

10 Because the order fail even rational-basis review, for the reasons given below,  
11 *see infra*, they *a fortiori* flunk intermediate scrutiny as well.

#### 12 **b. The School Closure Orders Fail Even Rational Basis Review**

13 In any event, the Order’s discriminatory treatment of school children across the  
14 state is not even “rationally related” to the state’s interest in combatting COVID-19.  
15 *City of New Orleans v. Dukes*, 427 U.S. 297, 303 (1976). As an initial matter,  
16 whether a county is on the monitoring list has *nothing* to do with the prevalence of  
17 COVID-19 at schools, or even among children. Instead, a county is placed on the  
18 monitoring list based on overall case rates and hospitalization rates. The order simply  
19 assumes that it is more dangerous to conduct in-person classes in counties where  
20 COVID-19 continues to spread among the general population than in other counties.  
21 But that assumption could not “*reasonably* be conceived to be true by the  
22 [Governor]” for several reasons. *Vance v. Bradley*, 440 U.S. 93, 111 (1979). *First*, as  
23 Plaintiffs have explained, the scientific evidence overwhelmingly confirms that  
24 children are not at risk of being sickened or killed by COVID-19. *See ante* at 7-11.  
25 Indeed, according to the state’s data, *not one* minor in California has died from  
26 COVID-19 since the virus began spreading in January and February. *See ante* at 17.  
27 Children also account for a vanishingly small percentage of total hospitalizations.  
28 McDonald Decl. ¶5. Children in hard-hit areas such as Los Angeles are thus just as  
unaffected by the virus as children in rural parts of the state. And because children do



1 not play a significant role in transmitting the virus to adults, Lyons-Weiler Decl. ¶23,  
2 teachers in Orange County are just as safe as teachers in any other county. Indeed,  
3 they are significantly safer than essential workers in many other professions who  
4 have daily contact with large numbers of adults.

5 *Second*, even the Governor apparently does not believe that allowing children  
6 to congregate in classrooms presents a grave danger of contagion, because he has  
7 allowed thousands of daycare facilities and camps to reopen, even in counties on the  
8 monitoring list.<sup>23</sup> There is no reasonable basis for believing that daycare centers and  
9 camps are safe but elementary schools are not. Although “a government need not  
10 provide a perfectly logical solution to regulatory problems, it cannot hope to  
11 survive *rational* basis review by resorting to irrationality.” *Merrifield v. Lockyer*, 547  
12 F.3d 978, 991 (9th Cir. 2008). But the Order is the height of irrationality. In the name  
13 of stopping the spread of COVID-19, they prohibit gatherings by the one population  
14 cohort that *does not spread* virus. And to prevent hospitals from being overwhelmed,  
15 they target the one group of people that is hardly ever sickened from COVID-19.  
16 Although the state undoubtedly has broad police powers with which to address public  
17 health concerns, it cannot enact a discriminatory regulatory regime that lacks any  
18 rational connection to the stated goal—as it has done here, with devastating effect.

19 **B. Defendants’ Orders Violate Title VI’s Implementing Regulations**  
20 **Because They Disparately Burden Racial Minorities**

21 Title VI of the Civil Rights Act of 1964 provides that “[n]o person in the  
22 United States shall, on the ground of race, color, or national origin, be excluded from  
23 participation in, be denied the benefits of, or be subjected to discrimination under any  
24 program or activity receiving Federal financial assistance.” 42 U.S.C. § 2000d. And,  
25 under Title VI regulations, Defendants may not enforce laws causing a disparate  
26 impact on racial minorities with regard to federally funded public programs,  
27  
28

---

<sup>23</sup> See *fn* 14-15.

1 including California’s schools. 28 C.F.R. § 42.104(b)(2).<sup>24</sup> “The basis for a  
2 successful disparate impact claim involves a comparison between two groups—those  
3 affected and those unaffected by the facially neutral policy.” *Darensburg v. Metro.*  
4 *Transp. Comm’n*, 636 F.3d 511, 519–20 (9th Cir. 2011). “An appropriate statistical  
5 measure must therefore take into account the correct population base and its racial  
6 makeup.” *Id.*

7 As explained further below, although virtually all students here will be  
8 “affected” by the Governor’s order, it will inflict *especially* devastating harm on  
9 those students whose socioeconomic circumstances do not allow for distance learning  
10 *at all* or who are enrolled in schools whose distance-teaching efforts have proven  
11 wholly inadequate. Magnifying both discriminatory effects is that the order applies  
12 predominantly to counties comprising higher percentages of racial minorities than the  
13 counties that are *not* on the Governor’s watch list and therefore not subject to the  
14 closure order.

15 Impoverished, vulnerable families in California are disproportionately  
16 minorities.<sup>25</sup> While these low-income families struggle with distance learning, many

---

17  
18 <sup>24</sup> Section 1983 creates a private right of action against the deprivation of federal  
19 rights against officials acting under color of state law. *See* 42 U.S.C. § 1983;  
20 *Alexander v. Sandoval*, 532 U.S. 275, 300 (2001) (Stevens, J., dissenting) (“[l]itigants  
21 who in the future wish to enforce the Title VI [disparate impact] regulations against  
22 state actors in all likelihood must only reference § 1983 to obtain relief.”). Plaintiffs  
23 rely on § 1983 here, although they recognize that Ninth Circuit precedent suggests that  
24 that statute cannot be used by private parties to vindicate a disparate-impact claim  
25 under Title VI’s regulations. *See Save Our Valley v. Sound Transit*, 335 F.3d 932 (9th  
26 Cir. 2003). If necessary, however, Plaintiffs will argue on appeal that *Save Our Valley*  
27 was incorrectly decided and should be overruled, which would put the Ninth Circuit  
28 on the correct side of an circuit conflict. *See, e.g., White v. Engler*, 188 F. Supp. 2d  
730, 743 (E.D. Mich. 2001) (discussing Sixth Circuit precedent).

<sup>25</sup> *See* Just the Facts: Poverty in California, Public Policy Institute of California, July  
2020, <https://www.ppic.org/publication/poverty-in-california/> (“22.9% of Latinos  
lived in poverty, compared to 18.% of African Americans, 15.9% of Asian  
Americans/Pacific Islanders, and 12.8% of whites. Though the Latino poverty rate  
has fallen from 30.9% in 2011, Latinos remain disproportionately poor—comprising  
51.4% of poor Californians but only 39.6% of the state population.”).

1 also do not receive the services required by their IEPs and are burdened by the  
2 additional costs to obtain private assistance or instruction. (*See* Ruiz Decl. ¶¶2, 5, 6, 9,  
3 10,; *see also* Hawkins Decl. ¶¶3, 10, 11; Bema Decl. ¶¶4, 6, 8, 9, 12; Ramirez Decl. ¶¶5,  
4 6, 7, 8, 15).

5 Plaintiffs Christine Ruiz and her son Z.R. have experienced this firsthand, as  
6 Ruiz has had to devote additional resources to hire an outside tutor due to her sons’  
7 IEP plans being neglected by the school. The State Order will continue to deprive  
8 Plaintiff Z.R. of an equal educational opportunity as distance learning leaves his IEP  
9 needs unfulfilled and keeps racial minorities, like the Plaintiffs, at a significant  
10 disadvantage from accessing equal educational opportunity.

11 **C. Defendants’ Orders Violate Federal Laws Requiring Equal**  
12 **Educational Access for Disabled Students**

13 **1. The Orders Violate the Individuals with Disabilities Education Act**

14 The Individuals with Disabilities Education Act (IDEA) requires States to  
15 provide disabled students with programming to meet their many needs. A State that  
16 receives federal funding under the IDEA “must provide a free appropriate public  
17 education—a FAPE, for short—to all eligible children.” *Endrew F. ex rel. Joseph F.*  
18 *v. Douglas Cty. Sch. Dist. RE-1*, 137 S. Ct. 988, 993 (2017) (citing 20 U.S.C.  
19 § 1412(a)(1)). “A FAPE, as the Act defines it, includes both ‘special education’ and  
20 ‘related services.’” *Id.* at 994 (citing 20 U.S.C. § 1401(9)). “‘Special education’ is  
21 ‘specially designed instruction ... to meet the unique needs of a child with a  
22 disability’; ‘related services’ are the support services ‘required to assist a child ... to  
23 benefit from’ that instruction.” *Id.* (citing 20 U.S.C. §§ 1401(26), (29)). The  
24 instruction and services provided by school districts must meet each student’s  
25 “academic, social, health, emotional, communicative, physical and vocational needs.”  
26 *Ashland Sch. Dist. v. Parents of Student E.H.*, 587 F.3d 1175, 1185 (9th Cir. 2009).  
27 To meet these needs, a school district’s services include “‘developmental, corrective,  
28 and other supportive services,’ such as ‘psychological services, physical and

1 occupational therapy, recreation ... [and] social work services.” *Id.* (citing 20  
2 U.S.C. § 1401(26)).<sup>26</sup>

3 Providing the IDEA’s mandatory “special education” and “related services”  
4 requires in-person education for many, if not all, disabled students. To begin, students  
5 with disabilities suffer “significant[ly]” from the lack of in-person instruction. *See*  
6 *COVID-19 Planning Considerations: Guidance for School Reentry*, American  
7 Academy of Pediatrics (Last Updated June 25, 2020),<sup>27</sup> Additionally, disabled  
8 students require more services than simply in-person instruction, including services  
9 from specialists such as occupational therapists, behavior specialists, and counselors.  
10 *See* 20 U.S.C. § 1401(26); *e.g.*, *Price v. Commonwealth Charter Academy – Cyber*  
11 *School*, 2019 WL 4346014, at \*3, \*5 (E.D. Penn. Sept 12, 2019); *K.B. on behalf of*  
12 *S.B. v. Katonah Lewisboro Union Free Sch. Dist.*, 2019 WL 5553292, at \*2  
13 (S.D.N.Y. Oct. 28, 2019). Indeed, “[e]ducation for [ ] students with disabilities often  
14 differs dramatically from ‘conventional’ [ ] education.” *E.R.K. ex rel. R.K. v. Hawaii*  
15 *Dep’t of Educ.*, 728 F.3d 982, 990 (9th Cir. 2013) (citing *Park ex rel. Park v.*  
16 *Anaheim Union Sch. Dist.*, 464 F.3d 1025, 1030–31 (9th Cir. 2006) (disabled high  
17 school student’s special education included “buttoning, zipping and toilet training”).  
18 To meet these needs, and the requirements of the IDEA, school districts must be able  
19 to provide at least some in-person services.

20 In addition to these general requirements, “[a] State covered by the IDEA must  
21 provide [each] disabled child with [ ] special education and related services ‘in  
22 conformity with the [child’s] individualized education program,’ or IEP.” *Andrew F.*,  
23

---

24 <sup>26</sup> Additionally, “[e]very school district has an affirmative, ongoing duty known as a  
25 ‘child find’ obligation,” which requires the district “to actively and systemically seek  
26 out, identify, locate, and evaluate children with disabilities in that district who may be  
27 in need of special education and related services.” *Garcia v. Capistrano Unified Sch.*  
28 *Dist.*, No. SACV162111DOCDFMX, 2019 WL 8884143, at \*16 (C.D. Cal. Sept. 27,  
2019) (citing 20 U.S.C. § 1412(a)(3)(A)).

<sup>27</sup> <https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/covid-19-planning-considerations-return-to-in-person-education-in-schools/>.

1 137 S. Ct. at 994 (citing 20 U.S.C. § 1401(9)(D)). An IEP must be “reasonably  
2 calculated to enable a child to make progress appropriate in light of the child’s  
3 circumstances,” which progress must be “markedly more . . . than *de minimis*.” *Id.* at  
4 999–1000 (citation omitted). And “a material failure” by the school “to implement an  
5 IEP violates the IDEA.” *Van Duyn ex rel. Van Duyn v. Baker Sch. Dist. 5J*, 502 F.3d  
6 811, 822 (9th Cir. 2007) (emphasis omitted). “A material failure occurs when there is  
7 more than a minor discrepancy between the services a school provides to a disabled  
8 child and the services required by the child's IEP.” *Id.*

9 Defendants’ Order prohibiting all in-person instruction violate the IDEA.  
10 Under the Order, all schools remain closed. *See* Executive Order N-60-20; *COVID-19*  
11 *and Reopening In-Person Learning Framework for K- 12 Schools in California,*  
12 *2020-2021 School Year*, California Dep’t of Pub. Health (July 17, 2020) (hereinafter  
13 “CDPH Framework”).<sup>28</sup> Schools “may reopen for in-person instruction” only if “they  
14 are located in a local health jurisdiction (LHJ) that has not been on the county  
15 monitoring list within the prior 14 days.” CDPH Framework (footnote omitted). This  
16 list currently contains 37 of California’s 58 counties. *County Monitoring List, County*  
17 *Variance info.*<sup>29</sup> And while local health officers may grant waivers to elementary  
18 schools, allowing them to reopen even if the county is on the monitoring list, this  
19 waiver exception applies only to elementary schools and requires consultation with  
20 CDPH. Moreover, evidence suggests that the criteria to obtain a waiver is nearly  
21 impossible to satisfy. Cicchetti Decl. ¶14.

22 Most counties are performing the required number of tests. *Id.* Four counties  
23 had fewer than the CDPH criteria of 150 tests performed per 100,000 people based on  
24 a 7-day average with a 7-day lag. *Id.* Nevertheless, three passed at least one of the  
25 “Case Rate” criteria based on less than 100 per 100,000 over 14 days, or less than a  
26

27 <sup>28</sup> Available as of the date of filing:

28 <https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/COVID-19/Schools%20Reopening%20Recommendations.pdf>.

<sup>29</sup> Available as of the date of filing: <https://covid19.ca.gov/roadmap-counties/#track-data>.

1 25-case rate and positivity less than 8%. *Id.* The other 54 counties exceeded the  
2 number of tests per day criteria but could not satisfy the case level criteria for re-  
3 opening. *Id.* There were 23 counties with case rates that exceeded both the CDPH  
4 threshold elevated case rate criteria. *Id.* There were another 14 counties that did not  
5 CDPH’s case rate per 100,000 (14 day) criteria. *Id.* These 37 counties could not seek  
6 a variance. Others would need to file a variance to re-open. *Id.*

7 Thus, the regulations and near impossibility of obtaining a waiver cause a  
8 significant portion of California’s schools will be unable to provide any in-person  
9 services to their students with disabilities. This complete failure to provide services to  
10 students with disabilities violates the IDEA.<sup>30</sup>

11 Moreover, failure to provide any in-person services will cause uncounted  
12 “material failure[s]” to implement the IEPs of disabled students. *See Van Duyn*, 502  
13 F.3d at 822. Without the physical presence of a teacher, who knows, sees that child  
14 on a daily basis, and cares for that child, the children are unable to be adequately  
15 protected from domestic abuse because the teacher is unable to see the signs of abuse  
16 via Zoom, that is if the child even has been attending the remote teaching sessions.  
17 Golden Decl. ¶7.

18 Plaintiff Ruiz’s experience exemplifies these violations. She notes the  
19 difficulties that distance learning causes her sons and that her sons’ IEPs cannot be  
20 followed, effectively resulting in no education whatsoever. As she states in her  
21 Declaration, Zoom learning is “useless” for her younger special needs child, as he  
22 cannot sit still and cannot follow commands given online. Additionally, his school  
23 provided him with a link to watch videos lasting a half hour per day. This de minimis  
24 “service” does not fulfill his IEP. Plaintiff Ruiz also has concerns for her middle son,  
25 who has severe autism, and has hands-on support of his individualized education  
26 team, dedicated to him the entire school day. Both of her sons have IEPs that specify  
27 precisely what is needed to provide appropriate education and since school was shut

28 \_\_\_\_\_  
<sup>30</sup> Moreover, the school districts will be unable to adequately seek out and identify children with disabilities, 20 U.S.C. § 1412(a)(3)(A), if school officials do not have regular, in-person contacts with those children.



1 down, neither child has been provided with any services required by each child’s IEP.  
2 This record provides no reason to believe that the state will suddenly begin providing  
3 statutorily mandated special needs services in the fall.

4 ///

5 **2. The Orders Violate the Americans with Disabilities Act (ADA) and**  
6 **Section 504 of the Rehabilitation Act**

7 Both the Americans with Disabilities Act (ADA) and the Rehabilitation Act  
8 require that public programs provide the same benefits to persons with disabilities  
9 provided to those without. “Section 12132 of the ADA precludes (1) exclusion  
10 from/denial of benefits of public services, as well as (2) discrimination by a public  
11 entity.” *Crowder v. Kitagawa*, 81 F.3d 1480, 1483 (9th Cir. 1996). This statute “was  
12 expressly modeled after § 504 of the Rehabilitation Act.” *Duvall v. Cty. of Kitsap*,  
13 260 F.3d 1124, 1135 (9th Cir. 2001), *as amended on denial of reh’g* (Oct. 11, 2001).  
14 “To establish a prima facie case of disability discrimination under the ADA, a  
15 plaintiff must prove” four elements. *E.R.K.*, 728 F.3d at 992. Plaintiff must prove that  
16 “(1) he is an individual with a disability; (2) he is otherwise qualified to participate in  
17 or receive the benefit of some public entity’s services, programs, or activities; (3) he  
18 was either excluded from participation in or denied the benefits of the public entity’s  
19 services, programs, or activities, or was otherwise discriminated against by the public  
20 entity; and (4) such exclusion, denial of benefits, or discrimination was by reason of  
21 [his] disability.” *Id.* (citation omitted). And to establish a violation of the  
22 Rehabilitation Act, the plaintiff must prove these same elements and “must also prove  
23 that the relevant program receives federal financial assistance.” *Id.* And any plaintiff  
24 “who requires an accommodation to meet a program’s essential eligibility  
25 requirements can establish the ‘otherwise qualified’ element of the prima facie case  
26 only by producing ‘evidence of the existence of a reasonable accommodation ... .’”  
27 *Id.*

28 Here, Plaintiffs have proven a prima facie case of discrimination under the  
ADA and Section 504. California receives federal funding for education, including

1 under the IDEA to provide special education to disabled students.<sup>31</sup> Plaintiff Z.R. is  
2 an individual with a disability who is otherwise qualified to receive an education and  
3 can do so with a reasonable accommodation. Ruiz Decl. ¶¶ 4-15. Given the inability  
4 of schools to provide in-person education under the Order, Z.R. has been denied the  
5 benefits of a public education. *See* pp. 34-35. And this denial is due to his disability:  
6 without his disability, Z.R. would be able to participate more fully in remote learning.  
7 *See supra* pp. 34-35.

8 **3. Plaintiffs Were Not Required to Exhaust Administrative Remedies**  
9 **Before Raising Claims Under the IDEA, ADA, or Rehabilitation Act**

10 While a plaintiff must generally exhaust administrative remedies before  
11 bringing claims under the IDEA or seeking “adequate education for disabled youth”  
12 under other laws, *Doe By & Through Brockhuis v. Arizona Dep’t of Educ.*, 111 F.3d  
13 678, 680–81, 685 (9th Cir. 1997) (citing 20 U.S.C. § 1415(e)(2), (f)), this  
14 requirement is subject to numerous exceptions. First, exhaustion is not required when  
15 “it would be futile to use the due process procedures.” *Hoelt v. Tucson Unified Sch.*  
16 *Dist.*, 967 F.2d 1298, 1303–04 (9th Cir. 1992) (citation omitted). Second, exhaustion  
17 is not required when the challenged policy is one “of general applicability that is  
18 contrary to the law,” *id.* (citation omitted), which occurs when the claim involves the  
19 administrative “procedures themselves, or requires restructuring of the education  
20 system itself.” *Doe By & Through Brockhuis*, 111 F.3d at 682. Third, exhaustion is  
21 not required when “it is improbable that adequate relief can be obtained by pursuing  
22 administrative remedies (e.g. the hearing officer lacks the authority to grant the relief  
23 sought).” *Hoelt*, 967 F.2d at 1303–04 (citation omitted). Finally, exhaustion is not  
24 required when “exhaustion would cause severe or irreparable harm.” *D.E. v. Cent.*  
25 *Dauphin Sch. Dist.*, 765 F.3d 260, 275 (3d Cir. 2014); *see also Meridian Joint Sch.*  
26 *Dist. No. 2 v. D.A.*, 792 F.3d 1054, 1068–69 (9th Cir. 2015) (explaining that  
27 exhaustion is not required when right sought to be vindicated is “time-sensitive”).  
28 When considering whether an exception applies, courts focus on “whether pursuit of

---

<sup>31</sup> Available as of the date of filing: <https://www.cde.ca.gov/sp/se/as/leagrnts.asp>.

1 administrative remedies will further the general purposes of exhaustion,” which are to  
2 “allow[ ] for the exercise of discretion and educational expertise by state and local  
3 agencies, afford[ ] full exploration of technical educational issues, further[ ]  
4 development of a complete factual record, and promote[ ] judicial efficiency by  
5 giving these agencies the first opportunity to correct shortcomings in their  
6 educational programs for disabled children.” *Hoelt*, 967 F.2d at 1302–03.

7 Plaintiffs were not required to exhaust administrative remedies for four  
8 independently sufficient reasons. First, “it would be futile to use the due process  
9 procedures.” *Hoelt*, 967 F.2d at 1303–04. The issues created by the Order cannot be  
10 solved by filing complaints with school districts, as the districts have no authority to  
11 override the Governor’s Order. For the same reason, “it is improbable that adequate  
12 relief can be obtained by pursuing administrative remedies.” *Id.* Third, the claim here  
13 is systemic, *id.*: the Executive Order prohibits schools from providing any in-person  
14 education whatsoever. *See Handberry v. Thompson*, 446 F.3d 335, 344 (2d Cir. 2006)  
15 (holding that plaintiffs did not need to exhaust administrative remedies when alleging  
16 an “absence of any services whatsoever”). Finally, “exhaustion would cause severe or  
17 irreparable harm.” *D.E.*, 765 F.3d at 275. Indeed, so likely and impending is  
18 irreparable harm that Plaintiffs have asked for an immediate injunction of the Order.  
19 *See infra* pp. 38-39. And exhausting administrative remedies here would serve none  
20 of the purposes of exhaustion, as the challenge to the Order is not fact-bound, but  
21 rather involves a legal challenge to a statewide order affecting every student in the  
22 State of California.

23 **II. PLAINTIFFS AND THEIR CHILDREN FACE IMMINENT**  
24 **IRREPARABLE HARM ABSENT IMMEDIATE INJUNCTIVE**  
25 **RELIEF**

26 “Irreparable harm is traditionally defined as harm for which there is no  
27 adequate legal remedy, such as an award of damages. *See Rent-A-Ctr., Inc. v.*  
28 *Canyon Television & Appliance Rental, Inc.*, 944 F.2d 597, 603 (9th Cir. 1991).  
Because intangible injuries generally lack an adequate legal remedy, “intangible  
injuries [may] qualify as irreparable harm.” *Arizona Dream Act Coalition v. Brewer*,

1 757 F. 3d 1053, 1068 (9th Cir. 2014). The deprivation of a constitutionally protected  
2 right such as those protected by the Fourteenth Amendment’s Equal Protection and  
3 Due Process Clauses inexorably creates irreparable harm. See *Elrod v. Burns* 427  
4 U.S. 347, 373 (1976).

5 Notably absent in distance learning is socialization, one-on-one aides and  
6 hands-on teacher supports, that are crucial to assisting students with disabilities and  
7 absolutely critical to success. Students with special needs are not the only children  
8 affected- several Plaintiffs have observed worrisome negative behaviors from lack of  
9 socialization in school. Several families have opted to leave school settings with  
10 inhumane requirements for children and do the best they can at starting their own  
11 alternative education. Sutton Decl. ¶6. This may prove equal to, better than, or worse  
12 than prior education provided, but nonetheless imposes breaking of social bonds and  
13 economic restrictions on families who counted on the educational system to teach  
14 children while adults work. *Id.* The uprooted children suffer; and the school system  
15 undergoes a shockwave. *Id.*

16 Plaintiff Brach is concerned for his daughter’s emotional state. Plaintiff Petrilla  
17 has noticed a sharp decline in his son’s enthusiasm for learning. Plaintiff Ziegler’s  
18 daughter is worried that she might not obtain college scholarship funds for college.  
19 Other Plaintiffs have articulated similar concerns based in their experiences.

20 “The irreparable nature of Plaintiffs’ injury is heightened by Plaintiffs’ young  
21 age and fragile socioeconomic position. Setbacks early in their careers are likely to  
22 haunt Plaintiffs for the rest of their lives. Thus, “a delay, even if only a few months,  
23 pending trial represents ... productive time irretrievably lost” to these young  
24 Plaintiffs. *Chalk*, 840 F.2d at 710. Plaintiffs’ entire careers may be constrained by  
25 professional opportunities they are denied today.” *Brewer* at 1068.

26 **III. THE REMAINING FACTORS WEIGH IN FAVOR OF GRANTING**  
27 **INJUNCTIVE RELIEF**

28 Where the government is the opposing party, balancing of the harm and the  
public interest merge. See *Nken*, 556 U.S. at 435. Thus, the Court asks whether any

1 significant “public consequences” would result from issuing the preliminary  
2 injunction. *Winter*, 555 U.S. at 24. “[I]t is always in the public interest to prevent the  
3 violation of a party’s constitutional rights.” *Melendres v. Arpaio*, 695 F.3d 990, 1002  
4 (9th Cir. 2012) (quoting *Elrod*, 427 U.S. at 373). “Faced with ... preventable human  
5 suffering, [the Ninth Circuit] ha[s] little difficulty concluding that the balance of  
6 hardships tips decidedly in plaintiffs’ favor.” *Hernandez v. Sessions*, 872 F.3d 976,  
7 996 (9th Cir. 2017) (quoting *Lopez v. Heckler*, 713 F.2d 1432, 1437 (9th Cir. 1983)).

8 **CONCLUSION**

9 Plaintiffs’ Motion for a Preliminary Injunction should be granted.

10 Respectfully submitted,

11 Date: July 30, 2020

DHILLON LAW GROUP INC.

12  
13 By: /s/ Harmeet K. Dhillon

Harmeet K. Dhillon

14 Mark P. Meuser

15 Gregory R. Michael

16 Michael Yoder (pro hac vice pending)

17 EIMER STAHL LLP

18 Robert Dunn

19 Ryan J. Walsh (pro hac vice pending)

20 John K. Adams (pro hac vice pending)

21 Amy C. Miller (pro hac vice pending)

22 Attorneys for Plaintiffs  
23  
24  
25  
26  
27  
28

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 ROBERT DUNN (SBN: 275600)  
 13 rdunn@eimerstahl.com  
 14 EIMER STAHL LLP  
 15 99 South Almaden Blvd., Suite 662  
 16 San Jose, CA 95113  
 17 (669) 231-8755

RYAN J. WALSH (pro hac vice pending)  
 rwalsh@eimerstahl.com  
 JOHN K. ADAMS (pro hac vice pending)  
 jadams@eimerstahl.com  
 AMY C. MILLER (pro hac vice pending)  
 amiller@eimerstahl.com  
 EIMER STAHL LLP  
 10 East Doty Street, Suite 800  
 Madison, WI 53703  
 (608) 441-579

*Attorneys for Plaintiffs*

**UNITED STATES DISTRICT COURT FOR  
 THE CENTRAL DISTRICT OF CALIFORNIA**

**MATTHEW BRACH, et al.**

Plaintiffs,

v.

**GAVIN NEWSOM, et al.**

Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

**DECLARATION OF MARK  
 MEUSER IN SUPPORT OF  
 MOTION FOR PRELIMINARY  
 INJUNCTION**

Judge: Hon. Dean D. Pregerson





1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

I, Mark P. Meuser declare:

1. I am an attorney in good standing duly admitted to practice before all Courts of the State of California since June 2004, the United States Supreme Court, the United States Court of Appeals for the Ninth Circuit, and before the all four United States District Courts located in California. Except as to those matters stated on information and belief, I have personal knowledge of the matters set forth herein, and if called as a witness could and would competently testify thereto. As to those matters stated on information and belief, I believe them to be true.

2. Attached as Exhibit 1 is a true and correct copy of the May 4, 2020 Executive Order N-6-20.

3. Attached as Exhibit 2 is a true and correct copy of the July 17, 2020 COVID-19 Industry Guidance: School and School-Based Programs.

4. Attached as Exhibit 3 is a true and correct copy of the July 17, 2020 California Department of Public Health COVID-19 and Reopening In-Person Learning Framework for K-12 Schools in California, 2020-2021 School Year.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct and is executed at Pasadena, California.

Dated: July 30, 2020.

DocuSigned by:  
*Mark Meuser*  
Mark P. Meuser



# **EXHIBIT 1**

EXECUTIVE DEPARTMENT  
STATE OF CALIFORNIA

EXECUTIVE ORDER N-60-20

**WHEREAS** on March 4, 2020, I proclaimed a State of Emergency to exist in California as a result of the threat of COVID-19; and

**WHEREAS** on March 19, 2020, I issued Executive Order N-33-20, which directed all California residents to immediately heed current State public health directives; and

**WHEREAS** State public health directives, available at <https://covid19.ca.gov/stay-home-except-for-essential-needs/>, have ordered all California residents stay home except for essential needs, as defined in State public health directives; and

**WHEREAS** COVID-19 continues to menace public health throughout California; and

**WHEREAS** the extent to which COVID-19 menaces public health throughout California is expected to continue to evolve, and may vary from place to place within the State; and

**WHEREAS** California law promotes the preservation of public health by providing for local health officers—appointed by county boards of supervisors and other local authorities—in addition to providing for statewide authority by a State Public Health Officer; and

**WHEREAS** these local health officers, working in consultation with county boards of supervisors and other local authorities, are well positioned to understand the local needs of their communities; and

**WHEREAS** local governments are encouraged to coordinate with federally recognized California tribes located within or immediately adjacent to the external geographical boundaries of such local government jurisdiction; and

**WHEREAS** the global COVID-19 pandemic threatens the entire State, and coordination between state and local public health officials is therefore, and will continue to be, necessary to curb the spread of COVID-19 throughout the State; and

**WHEREAS** State public health officials have worked, and will continue to work, in consultation with their federal, state, and tribal government partners; and

**WHEREAS** the State Public Health Officer has articulated a four-stage framework—which includes provisions for the reopening of lower-risk businesses and spaces (“Stage Two”), to be followed by the reopening of higher-risk businesses and spaces (“Stage Three”)—to allow Californians to gradually resume various activities while continuing to preserve public health in the face of COVID-19; and



**WHEREAS** the threat posed by COVID-19 is dynamic and ever-changing, and the State's response to COVID-19 (including implementation of the four-stage framework) should likewise retain the ability to be dynamic and flexible; and

**WHEREAS** to preserve this flexibility, and under the provisions of Government Code section 8571, I find that strict compliance with the Administrative Procedure Act, Government Code section 11340 et seq., would prevent, hinder, or delay appropriate actions to prevent and mitigate the effects of the COVID-19 pandemic.

**NOW, THEREFORE, I, GAVIN NEWSOM**, Governor of the State of California, in accordance with the authority vested in me by the State Constitution and statutes of the State of California, and in particular, Government Code sections 8567, 8571, 8627, and 8665; and also in accordance with the authority vested in the State Public Health Officer by the laws of the State of California, including but not limited to Health and Safety Code sections 120125, 120130, 120135, 120140, 120145, 120150, 120175, and 131080; do hereby issue the following Order to become effective immediately:

**IT IS HEREBY ORDERED THAT:**

- 1) All residents are directed to continue to obey State public health directives, as made available at <https://covid19.ca.gov/stay-home-except-for-essential-needs/> and elsewhere as the State Public Health Officer may provide.
- 2) As the State moves to allow reopening of lower-risk businesses and spaces ("Stage Two"), and then to allow reopening of higher-risk businesses and spaces ("Stage Three"), the State Public Health Officer is directed to establish criteria and procedures—as set forth in this Paragraph 2—to determine whether and how particular local jurisdictions may implement public health measures that depart from the statewide directives of the State Public Health Officer.

In particular, the State Public Health Officer is directed to establish criteria to determine whether and how, in light of the extent to which the public health is menaced by COVID-19 from place to place within the State, local health officers may (during the relevant stages of reopening) issue directives to establish and implement public health measures less restrictive than any public health measures implemented on a statewide basis pursuant to the statewide directives of the State Public Health Officer.

The State Public Health Officer is further directed to establish procedures through which local health officers may (during the relevant stages of reopening) certify that, if their respective jurisdictions are subject to proposed public health measures (which they shall specify to the extent such specification may be required by the State Public Health Officer) that are less restrictive than public health measures implemented on a statewide basis pursuant to the statewide directives of the State Public Health Officer, the public health will not be menaced. The State Public Health Officer shall additionally establish procedures to permit, in a manner consistent with public health and

safety, local health officers who submit such certifications to establish and implement such less restrictive public health measures within their respective jurisdictions.

The State Public Health Officer may, from time to time and as she deems necessary to respond to the dynamic threat posed by COVID-19, revise the criteria and procedures set forth in this Paragraph 2. Nothing related to the establishment or implementation of such criteria or procedures, or any other aspect of this Order, shall be subject to the Administrative Procedure Act, Government Code section 11340 et seq. Nothing in this Paragraph 2 shall limit the authority of the State Public Health Officer to take any action she deems necessary to protect public health in the face of the threat posed by COVID-19, including (but not limited to) any necessary revision to the four-stage framework previously articulated by the State Public Health Officer.

- 3) Nothing in this Order shall be construed to limit the existing authority of local health officers to establish and implement public health measures within their respective jurisdictions that are more restrictive than, or that otherwise exist in addition to, the public health measures imposed on a statewide basis pursuant to the statewide directives of the State Public Health Officer.

**IT IS FURTHER ORDERED** that as soon as hereafter possible, this Order be filed in the Office of the Secretary of State and that widespread publicity and notice be given of this Order.

This Order is not intended to, and does not, create any rights or benefits, substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

**IN WITNESS WHEREOF** I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 4th day of May 2020.



\_\_\_\_\_  
GAVIN NEWSOM  
Governor of California

**ATTEST:**

\_\_\_\_\_  
ALEX PADILLA  
Secretary of State

## **EXHIBIT 2**

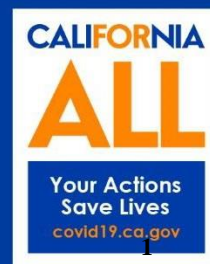




# COVID-19 INDUSTRY GUIDANCE: Schools and School- Based Programs

Release date: July 17, 2020

*All guidance should be implemented only with county health officer approval following their review of local epidemiological data including cases per 100,000 population, rate of test positivity, and local preparedness to support a health care surge, vulnerable populations, contact tracing, and testing.*



## OVERVIEW

Communities across the state are preparing for the forthcoming school year. To assist with that planning process, the following guidelines and considerations are intended to help school and community leaders plan and prepare to resume in-person instruction.

This guidance is interim and subject to updates. These guidelines and considerations are based on the best available public health data at this time, international best practices currently employed, and the practical realities of managing school operations; as new data and practices emerge. Additionally, the guidelines and considerations do not reflect the full scope of issues that school communities will need to address, which range from day-to-day site-based logistics to the social and emotional well-being of students and staff.

California public schools (traditional and charter), private schools (including nonpublic nonsectarian schools), school districts, and county offices of education, herein referred to as schools, will determine the most appropriate instructional model, taking into account the needs of their students and staff, and their available infrastructure. This guidance is not intended to prevent a school from adopting a distance learning, hybrid, or mixed-delivery instructional model to ensure safety. Schools are not required to seek out or receive approval from a state or local public health officer prior to adopting a distance-learning model.

Implementation of this guidance will depend on local public health conditions, including those listed [here](#). Communities meeting those criteria, such as lower incidence of COVID-19 and adequate preparedness, may implement the guidance described below as part of a phased reopening. All decisions about following this guidance should be made in collaboration with local health officials and other authorities.

Implementation of this guidance should be tailored for each setting, including adequate consideration of instructional programs operating at each school site and the needs of students and families. School leaders should engage relevant stakeholders—including families, staff and labor partners in the school community—to formulate and implement plans that consider the following:

- Student, Family and Staff Population: Who are the student, family and staff populations who will be impacted by or can serve as partners in implementing any of the following measures?
- Ability to Implement or Adhere to Measures: Do staff, students and families have the tools, information, resources and ability to successfully adhere to or implement the new measures?
- Negative or Unintended Consequences: Are there any negative or unintended consequences to staff, students or families of implementing the measures and how can those consequences be mitigated?

This guidance is not intended to revoke or repeal any worker rights, either statutory, regulatory or collectively bargained, and is not exhaustive, as it does not include county health orders, nor is it a substitute for any existing safety and health-related regulatory requirements such as those of Cal/OSHA. Stay current on changes to public health guidance and state/local orders, as the COVID-19 situation continues.



## 1. General Measures

- Establish and continue communication with local and State authorities to determine current disease levels and control measures in your community. For example:
  - Review and refer to, if applicable, the relevant county variance documentation. Documentation can be found [here](#).
  - Consult with your county health officer, or designated staff, who are best positioned to monitor and provide advice on local conditions. A directory can be found [here](#).
  - Collaborate with other schools and school partners in your region, including the county office of education.
  - Regularly review updated guidance from state agencies, including the [California Department of Public Health](#) and [California Department of Education](#).
- Establish a written, worksite-specific COVID-19 prevention plan at every facility, perform a comprehensive risk assessment of all work areas and work tasks, and designate a person at each school to implement the plan.
  - Identify contact information for the local health department where the school is located for communicating information about COVID-19 outbreaks among students or staff.
  - Incorporate the [CDPH Guidance](#) for the Use of Face Coverings, into the School Site Specific Plan that includes a policy for handling exemptions.
  - Train and communicate with workers and worker representatives on the plan. Make the written plan available and accessible to workers and worker representatives.
  - Regularly evaluate the workplace for compliance with the plan and document and correct deficiencies identified.
  - Investigate any COVID-19 illness and determine if any work-related factors could have contributed to risk of infection. Update the plan as needed to prevent further cases.
  - Implement the necessary processes and protocols when a workplace has an outbreak, in accordance with [CDPH guidelines](#).
  - Identify individuals who have been in close contact (within six feet for

15 minutes or more) of an infected person and take steps to isolate COVID-19 positive person(s) and close contacts. See Section 10 for more detail.

- Adhere to these guidelines. Failure to do so could result in workplace illnesses that may cause classrooms or the entire school to be temporarily closed or limited.
- Evaluate whether and to what extent external community organizations can safely utilize the site and campus resources. Ensure external community organizations that use the facilities also follow this guidance.
- Develop a plan for the possibility of repeated closures of classes, groups or entire facilities when persons associated with the facility or in the community become ill with COVID-19. See Section 10 below.
- Develop a plan to further support students with access and functional needs who may be at increased risk of becoming infected or having unrecognized illness due to COVID-19. For example, review existing student health plans to identify students who may need additional accommodations, develop a process for engaging families for potentially unknown concerns that may need to be accommodated or identify additional preparations for classroom and non-classroom environments as needed. Groups who might be at increased risk of becoming infected or having unrecognized illness include the following:
  - Individuals who have limited mobility or require prolonged and close contact with others, such as direct support providers and family members;
  - Individuals who have trouble understanding information or practicing preventive measures, such as hand washing and physical distancing; and
  - Individuals who may not be able to communicate symptoms of illness.
- Schools should review the [CDPH Guidance for the Use of Face Coverings](#) and any applicable local health department guidance and incorporate face-covering use for students and workers into their COVID-19 prevention plan. Some flexibility may be needed for younger children consistent with child development recommendations. See Section 3 for more information.



## 2. Promote Healthy Hygiene Practices

- Teach and reinforce [washing hands](#), avoiding [contact with one's eyes, nose, and mouth](#), and [covering coughs and sneezes](#) among students and staff.
  - Teach students and remind staff to use tissue to wipe their nose and to cough/sneeze inside a tissue or their elbow.
  - Students and staff should wash their hands frequently throughout the day, including before and after eating; after coughing or sneezing; after classes where they handle shared items, such as outside recreation, art, or shop; and before and after using the restroom.
  - Students and staff should wash their hands for 20 seconds with soap, rubbing thoroughly after application. Soap products marketed as “antimicrobial” are not necessary or recommended.
  - Staff should model and practice handwashing. For example, for lower grade levels, use bathroom time as an opportunity to reinforce healthy habits and monitor proper handwashing.
  - Students and staff should use fragrance-free hand sanitizer when handwashing is not practicable. Sanitizer must be rubbed into hands until completely dry. Note: frequent handwashing is more effective than the use of hand sanitizers.
  - Ethyl alcohol-based hand sanitizers are preferred and should be used when there is the potential of unsupervised use by children.
    - Isopropyl hand sanitizers are more toxic when ingested or absorbed in skin.
    - Do not use hand sanitizers that may [contain methanol](#) which can be hazardous when ingested or absorbed.
  - Children under age 9 should only use hand sanitizer under adult supervision. Call Poison Control if consumed: 1-800-222-1222.
- Consider portable handwashing stations throughout a site and near classrooms to minimize movement and congregations in bathrooms to the extent practicable.
- Develop routines enabling students and staff to regularly wash their hands at staggered intervals.
- Ensure adequate supplies to support healthy hygiene behaviors, including soap, tissues, no-touch trashcans, face coverings, and hand sanitizers with at least 60 percent ethyl alcohol for staff and children who can safely use hand sanitizer.



- Information contained in the [CDPH Guidance](#) for the Use of Face Coverings should be provided to staff and families, which discusses the circumstances in which face coverings must be worn and the exemptions, as well as any policies, work rules, and practices the employer has adopted to ensure the use of face coverings.
- Employers must provide and ensure staff use face coverings in accordance with CDPH guidelines and all required protective equipment.
- The California Governor's Office of Emergency Services (CalOES) and the Department of Public Health (CDPH) are and will be working to support procurement and distribution of face coverings and personal protective equipment. Additional information can be found [here](#).
- Strongly recommend that all students and staff be immunized each autumn against influenza unless contraindicated by personal medical conditions, to help:
  - Protect the school community
  - Reduce demands on health care facilities
  - Decrease illnesses that cannot be readily distinguished from COVID-19 and would therefore trigger extensive measures from the school and public health authorities.
- Nothing in this guidance should be interpreted as restricting access to appropriate educational services.



### 3. Face Coverings

Face coverings must be used in accordance with [CDPH guidelines](#) unless a person is exempt as explained in the guidelines, particularly in indoor environments, on school buses, and areas where physical distancing alone is not sufficient to prevent disease transmission.

- Teach and reinforce use of [face coverings](#), or in limited instances, face shields.
- Students and staff should be frequently reminded not to touch the face covering and to [wash their hands](#) frequently.
- Information should be provided to all staff and families in the school community on [proper use, removal, and washing of cloth face coverings](#).
- Training should also include policies on how people who are exempted from wearing a face covering will be addressed.

## STUDENTS

Age	Face Covering Requirement
Under 2 years old	No
2 years old – 2 <sup>nd</sup> grade	Strongly encouraged**
3 <sup>rd</sup> grade – High School	Yes, unless exempt

\*\*Face coverings are strongly encouraged for young children between two years old and second grade, if they can be worn properly. A face shield is an acceptable alternative for children in this cohort who cannot wear them properly.

- Persons younger than two years old, anyone who has trouble breathing, anyone who is unconscious or incapacitated, and anyone who is otherwise unable to remove the face covering without assistance are exempt from wearing a face covering.
- A cloth face covering or face shield should be removed for meals, snacks, naptime, or outdoor recreation, or when it needs to be replaced. When a cloth face covering is temporarily removed, it should be placed in a clean paper bag (marked with the student's name and date) until it needs to be put on again.
- In order to comply with this guidance, schools must exclude students from campus if they are not exempt from wearing a face covering under CDPH guidelines and refuse to wear one provided by the school. Schools should develop protocols to provide a face covering to students who inadvertently fail to bring a face covering to school to prevent unnecessary exclusions. Schools should offer alternative educational opportunities for students who are excluded from campus.

## STAFF

- All staff must use face coverings in accordance with [CDPH guidelines](#) unless Cal/OSHA standards require respiratory protection.
- In limited situations where a face coverings cannot be used for pedagogical or developmental reasons, (i.e. communicating or assisting young children or those with special needs) a face shield can be used instead of a cloth face covering while in the classroom as long as the wearer maintains physical distance from others, to the extent practicable. Staff must return to wearing a face covering outside of the classroom.

- Workers or other persons handling or serving food must use gloves in addition to face coverings. Employers should consider where disposable glove use may be helpful to supplement frequent handwashing or use of hand sanitizer; examples are for workers who are screening others for symptoms or handling commonly touched items.



## 4. Ensure Teacher and Staff Safety

- Ensuring staff maintain physical distancing from each other is critical to reducing transmission between adults.
- Ensure that all staff use face coverings in accordance with CDPH guidelines and Cal/OSHA standards.
- Support staff who are at higher risk for severe illness or who cannot safely distance from household contacts at higher risk, by providing options such as telework, where appropriate, or teaching in a virtual learning or independent study context.
- Conduct all staff meetings, professional development training and education, and other activities involving staff with physical distancing measures in place, or virtually, where physical distancing is a challenge.
- Minimize the use of and congregation of adults in staff rooms, break rooms, and other settings.
- Implement procedures for daily symptom monitoring for staff.



## 5. Intensify Cleaning, Disinfection, and Ventilation

- Consider suspending or modifying use of site resources that necessitate sharing or touching items. For example, consider suspending use of drinking fountains and instead encourage the use of reusable water bottles.
- Staff should [clean and disinfect](#) frequently-touched surfaces at school and on school buses at least daily and, as practicable, these surfaces should be cleaned and disinfected frequently throughout the day by trained custodial staff.
- Buses should be thoroughly cleaned and disinfected daily and after transporting any individual who is exhibiting symptoms of COVID-19. Drivers should be provided disinfectant wipes and disposable gloves to

support disinfection of frequently touched surfaces during the day.

- Frequently touched surfaces in the school include, but are not limited to:
  - Door handles
  - Light switches
  - Sink handles
  - Bathroom surfaces
  - Tables
  - Student Desks
  - Chairs
- Limit use and sharing of objects and equipment, such as toys, games, art supplies and playground equipment to the extent practicable. When shared use is allowed, clean and disinfect between uses.
- When choosing disinfecting products, use those approved for use against COVID-19 on the [Environmental Protection Agency \(EPA\)-approved list "N"](#) and follow product instructions.
  - To [reduce the risk of asthma](#) and other health effects related to disinfecting, programs should select disinfectant products on list N with asthma-safer ingredients (hydrogen peroxide, citric acid or lactic acid) as recommended by the US EPA Design for Environment program.
  - Avoid products that contain peroxyacetic (paracetic) acid, sodium hypochlorite (bleach) or quaternary ammonium compounds, which can cause asthma.
  - Follow label directions for appropriate dilution rates and contact times. Provide workers training on the chemical hazards, **manufacturer's directions**, Cal/OSHA requirements for safe use, and as applicable and as required by the Healthy Schools Act.
  - Custodial staff and any other workers who clean and disinfect the school site must be equipped with proper protective equipment, including gloves, eye protection, respiratory protection, and other appropriate protective equipment as required by the product instructions. All products must be kept out of children's reach and stored in a space with restricted access.
  - Establish a cleaning and disinfecting schedule in order to avoid both under- and over-use of cleaning products.

- Ensure safe and correct application of disinfectant and keep products away from students.
- Ensure proper ventilation during cleaning and disinfecting. Introduce fresh outdoor air as much as possible, for example, by opening windows where practicable. When cleaning, air out the space before children arrive; plan to do thorough cleaning when children are not present. If using air conditioning, use the setting that brings in outside air. Replace and check air filters and filtration systems to ensure optimal air quality.
  - If opening windows poses a safety or health risk (e.g., by allowing pollen in or exacerbating asthma symptoms) to persons using the facility, consider alternatives. For example, maximize central air filtration for HVAC systems (targeted filter rating of at least MERV 13).
- Consider installing portable high-efficiency air cleaners, upgrading the building's air filters to the highest efficiency possible, and making other modifications to increase the quantity of outside air and ventilation in classrooms, offices and other spaces.
- [Take steps](#) to ensure that all water systems and features (for example, drinking fountains and decorative fountains) are safe to use after a prolonged facility shutdown to minimize the risk of [Legionnaires' disease](#) and other diseases associated with water.



## 6. Implementing Distancing Inside and Outside the Classroom



### Arrival and Departure

---

- Maximize space between students and between students and the driver on school buses and open windows to the greatest extent practicable.
- Minimize contact at school between students, staff, families and the community at the beginning and end of the school day. Prioritize minimizing contact between adults at all times.
- Stagger arrival and drop off-times and locations as consistently as practicable as to minimize scheduling challenges for families.
- Designate routes for entry and exit, using as many entrances as feasible. Put in place other protocols to limit direct contact with others as much as practicable.
- Implement health screenings of students and staff upon arrival at school (see Section 9).

- Ensure each bus is equipped with extra unused face coverings on school buses for students who may have inadvertently failed to bring one.

## Classroom Space

---

- To reduce possibilities for infection, students must remain in the same space and in cohorts as small and consistent as practicable, including for recess and lunch. Keep the same students and teacher or staff with each group, to the greatest extent practicable.
- Prioritize the use and maximization of outdoor space for activities where practicable.
- Minimize movement of students and teachers or staff as much as practicable. For example, consider ways to keep teachers with one group of students for the whole day. In secondary schools or in situations where students have individualized schedules, plan for ways to reduce mixing among cohorts and to minimize contact.
- Maximize space between seating and desks. Distance teacher and other staff desks at least six feet away from student desks. Consider ways to establish separation of students through other means if practicable, such as, six feet between desks, where practicable, partitions between desks, markings on classroom floors to promote distancing or arranging desks in a way that minimizes face-to-face contact.
- Consider redesigning activities for smaller groups and rearranging furniture and play spaces to maintain separation.
- Staff should develop instructions for maximizing spacing and ways to minimize movement in both indoor and outdoor spaces that are easy for students to understand and are developmentally appropriate.
- Activities where there is increased likelihood for transmission from contaminated exhaled droplets such as band and choir practice and performances are not permitted.
- Activities that involve singing must only take place outdoors.
- Implement procedures for turning in assignments to minimize contact.
- Consider using privacy boards or clear screens to increase and enforce separation between staff and students.





## Non-Classroom Spaces

---

- Limit nonessential visitors, volunteers and activities involving other groups at the same time.
- Limit communal activities where practicable. Alternatively, stagger use, properly space occupants and disinfect in between uses.
- Consider use of non-classroom space for instruction, including regular use of outdoor space, weather permitting. For example, consider part-day instruction outside.
- Minimize congregate movement through hallways as much as practicable. For example, establish more ways to enter and exit a campus, create staggered passing times when necessary or when students cannot stay in one room and create guidelines on the floor that students can follow to enable physical distancing while passing. In addition, schools can consider eliminating the use of lockers and moving to block scheduling, which supports the creation of cohort groups and reduces changes of classrooms.
- Serve meals outdoors or in classrooms instead of cafeterias or group dining rooms where practicable. Where cafeterias or group dining rooms must be used, keep students together in their cohort groups, ensure physical distancing, and consider assigned seating. Serve individually plated or bagged meals. Avoid sharing of foods and utensils and buffet or family-style meals.
- Consider holding recess activities in separated areas designated by class.



## 7. Limit Sharing

- Keep each child's belongings separated and in individually labeled storage containers, cubbies or areas. Ensure belongings are taken home each day to be cleaned.
- Ensure adequate supplies to minimize sharing of high-touch materials (art supplies, equipment, etc.) to the extent practicable or limit use of supplies and equipment to one group of children at a time and clean and disinfect between uses.
- Avoid sharing electronic devices, clothing, toys, books and other games or learning aids as much as practicable. Where sharing occurs, clean and disinfect between uses.



## 8. Train All Staff and Educate Families

- Train all staff and provide educational materials to families in the following safety actions:
  - Enhanced sanitation practices
  - Physical distancing guidelines and their importance
  - [Proper use, removal, and washing of face coverings](#)
  - Screening practices
  - How COVID-19 is spread
  - COVID-19 specific [symptom](#) identification
  - Preventing the spread of COVID-19 if you are sick, including the importance of not coming to work if staff members have symptoms, or if they or someone they live with has been diagnosed with COVID-19.
  - For workers, COVID-19 specific [symptom](#) identification and when to seek medical attention
  - The employer's plan and procedures to follow when children or adults become sick at school.
  - The employer's plan and procedures to protect workers from COVID-19 illness.
- Consider conducting the training and education virtually, or, if in-person, ensure a minimum of six-foot distancing is maintained.



## 9. Check for Signs and Symptoms

- Prevent discrimination against students who (or whose families) were or are diagnosed with COVID-19 or who are perceived to be a COVID-19 risk.
- Actively encourage staff and students who are sick or who have recently had [close contact](#) with a person with COVID-19 to stay home. Develop policies that encourage sick staff and students to stay at home without **fear of reprisal, and ensure staff, students and students' families** are aware of these policies.
- Implement screening and other procedures for all staff and students entering the facility.

- Conduct visual wellness checks of all students or establish procedures for parents to monitor at home. If checking temperatures, use a no-touch thermometer.
- Ask all individuals if they or anyone in their home is exhibiting [COVID-19 symptoms](#).
- Make available and encourage use of hand-washing stations or hand sanitizer.
- Document/track incidents of possible exposure and notify local health officials, staff and families immediately of any exposure to a positive case of COVID-19 at school while maintaining confidentiality, as required under FERPA and state law related to privacy of educational records. Additional guidance can be found [here](#). As noted in Section 11 below, the staff liaison can serve a coordinating role to ensure prompt and responsible notification.
- If a student is exhibiting symptoms of COVID-19, staff should communicate with the parent/caregiver and refer to the student's health history form and/or emergency card.
- Monitor staff and students throughout the day for signs of illness; send home students and staff with a fever of 100.4 degrees or higher, cough or other [COVID-19 symptoms](#).
- Policies should not penalize students and families for missing class.



## 10. Plan for When a Staff Member, Child or Visitor Becomes Sick

- Work with school administrators, nurses and other healthcare providers to identify an isolation room or area to separate anyone who exhibits symptoms of COVID-19.
- Any students or staff exhibiting symptoms should immediately be required to wear a face covering and be required to wait in an isolation area until they can be transported home or to a healthcare facility, as soon as practicable.
- Establish procedures to arrange for safe transport home or to a healthcare facility, as appropriate, when an individual is exhibiting COVID-19 symptoms:
  - Fever
  - Cough

- Shortness of breath or difficulty breathing
- Chills
- Repeated shaking with chills
- Fatigue
- Muscle pain
- Headache
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea
- New loss of taste or smell
- For serious injury or illness, call 9-1-1 without delay. Seek medical attention if COVID-19 symptoms become severe, including persistent pain or pressure in the chest, confusion, or bluish lips or face. Updates and further details are available on [CDC's webpage](#).
- Notify local health officials immediately of any positive case of COVID-19, and exposed staff and families as relevant while maintaining confidentiality as required by state and federal laws. Additional guidance can be found [here](#).
- Close off areas used by any individual suspected of being infected with the virus that causes COVID-19 and do not use before cleaning and disinfection. To reduce risk of exposure, wait 24 hours before you [clean and disinfect](#). If it is not possible to wait 24 hours, wait as long as practicable. Ensure a [safe and correct application](#) of disinfectants using personal protective equipment and ventilation recommended for cleaning. Keep disinfectant products away from students.
- Advise sick staff members and students not to return until they have met CDC criteria to discontinue [home isolation](#), including at least 3 days with no fever, symptoms have improved and at least 10 days since symptoms first appeared.
- Ensure that students, including students with disabilities, have access to instruction when out of class, as required by federal and state law.
- Schools should offer distance learning based on the unique circumstances of each student who would be put at-risk by an in-person instructional model. For example, students with a health condition,

students with family members with a health condition, students who cohabitate or regularly interact with high-risk individuals, or are otherwise identified as “at-risk” by the parents or guardian, are students whose circumstances merit coffering distances learning.

- Implement the necessary processes and protocols when a school has an outbreak, in accordance with [CDPH guidelines](#).
- Investigate the COVID-19 illness and exposures and determine if any work-related factors could have contributed to risk of infection. Update protocols as needed to prevent further cases.
- Update protocols as needed to prevent further cases. See the CDPH guidelines, [Responding to COVID-19 in the Workplace](#), which are incorporated into this guidance and contain detailed recommendations for establishing a plan to identify cases, communicating with workers and other exposed persons, and conducting and assisting with contact tracing.



## 11. Maintain Healthy Operations

- Monitor staff absenteeism and have a roster of trained back-up staff where available.
- Monitor the types of illnesses and symptoms among your students and staff to help isolate them promptly as needed.
- Designate a staff liaison or liaisons to be responsible for responding to COVID-19 concerns. Workers should know who they are and how to contact them. The liaison should be trained to coordinate the documentation and tracking of possible exposure, in order to notify local health officials, staff and families in a prompt and responsible manner.
- Maintain communication systems that allow staff and families to self-report symptoms and receive prompt notifications of exposures and closures, while maintaining confidentiality, as required by FERPA and state law related to privacy of educational records. Additional guidance can be found [here](#).
- Consult with local health departments if routine testing is being considered by a local educational agency. The role of providing routine systematic testing of staff or students for COVID-19 (e.g., PCR swab testing for acute infection, or presence of antibodies in serum after infection) is currently unclear.
- Support students who are at higher risk for severe illness or who cannot safely distance from household contacts at higher risk, by providing options such as virtual learning or independent stud



## 12. Considerations for Reopening and Partial or Total Closures

California schools have been closed for in-person instruction since mid-March 2020 due to the COVID-19 pandemic. School closures to in-person instruction were part of a broader set of recommendations intended to reduce transmission of SARS-CoV-2, the virus that causes COVID-19. For more detailed direction on measures to be taken when a student, teacher, or staff member has symptoms or is diagnosed with COVID-19, please see the [COVID-19 and Reopening Framework for K-12 Schools in California](#).

- Check State and local orders and health department notices daily about transmission in the area or closures and adjust operations accordingly.
- When a student, teacher or staff member tests positive for COVID-19 and had exposed others at the school, refer to the [CDPH Framework for K-12 Schools](#), and implement the following steps:
  - In consultation with the local public health department, the appropriate school official may decide whether school closure versus cleaning and quarantine of exposed persons or other intervention is warranted, including the length of time necessary, based on the risk level within the specific community as determined by the local public health officer.
  - Close off the classroom or office where the patient was based and do not use these areas until after cleaning and disinfection. Wait at least 24 hours before cleaning and disinfecting. If 24 hours is not feasible, wait as long as possible.
  - Additional areas of the school visited by the COVID-19 positive individual may also need to be closed temporarily for cleaning and disinfection.
  - Implement communication plans for exposure at school and potential school closures to include outreach to students, parents, teachers, staff and the community.
  - Include information for staff regarding labor laws, information regarding Disability Insurance, Paid Family Leave and Unemployment Insurance, as applicable to schools. See additional [information on government programs supporting sick leave and worker's compensation for COVID-19](#), including worker's sick leave rights under [the Families First Coronavirus Response Act](#) and employee's rights to workers' compensation benefits and



presumption of the work-relatedness of COVID-19 pursuant to the [Governor's Executive Order N-62-20](#), while that Order is in effect.

- o Provide guidance to parents, teachers and staff reminding them of the importance of community physical distancing measures while a school is closed, including discouraging students or staff from gathering elsewhere.
- o Develop a plan for continuity of education. Consider in that plan how to also continue nutrition and other services provided in the regular school setting to establish alternate mechanisms for these services to continue.
- o Maintain regular communications with the local public health department.



## EXHIBIT 3

COVID-19 and Reopening In-Person Learning  
Framework for K-12 Schools in California, 2020-2021 School Year  
July 17, 2020

Overview

California schools have been closed for in-person instruction since mid-March 2020 due to the COVID-19 pandemic. School closures to in-person instruction were part of a broader set of recommendations intended to reduce transmission of SARS-CoV-2, the virus that causes COVID-19. CDPH developed the following framework to support school communities as they decide when and how to implement in-person instruction for the 2020-2021 school year. New evidence and data about COVID-19 transmission, including variations by age, and the effectiveness of disease control and mitigation strategies continues to emerge regularly. Recommendations regarding in-person school reopening and closure should be based on the available evidence as well state and local disease trends.

The CA [School Sector Specific Guidelines](#), and the Centers for Disease Control and Prevention [CDC](#) have published additional guidance on school re-entry.

In-Person Re-Opening Criteria

Schools and school districts may reopen for in-person instruction at any time if they are located in a local health jurisdiction (LHJ) that has not been on the county<sup>1</sup> monitoring list within the prior 14 days.

If the LHJ has been on the monitoring list within the last 14 days, the school must conduct distance learning only, until their LHJ has been off the monitoring list for at least 14 days.<sup>2</sup>

<sup>1</sup> School districts in LHJs that are cities are considered to be included as part of the county if the county is on the monitoring list.

<sup>2</sup> A waiver of this criteria may be granted by the local health officer for elementary schools to open for in-person instruction. A waiver may only be granted if one is requested by the superintendent (or equivalent for charter or private schools), in consultation with labor, parent and community organizations. Local health officers must review local community epidemiological data, consider other public health interventions, and consult with CDPH when considering a waiver request.



## Guidance Once Re-Opened to In-Person Instruction

### *How should schools think about testing?*

Once schools are re-opened to at least some in-person instruction, it is recommended that surveillance testing be implemented based on the local disease trends. If epidemiological data indicates concern for increasing community transmission, schools should increase testing of staff to detect potential cases as lab testing capacity allows.

### *Who should be tested and how often?*

School staff are essential workers, and staff includes teachers, para-professionals, cafeteria workers, janitors, bus drivers, or any other school employee that may have contact with students or other staff. School districts and schools shall test staff periodically, as testing capacity permits and as practicable. Examples of recommended frequency include testing all staff over 2 months, where 25% of staff are tested every 2 weeks, or 50% every month to rotate testing of all staff over time.

### *What if a school or school district reopens to in-person instruction, but the county is later placed on the county monitoring list?*

Schools should begin testing staff, or increase frequency of staff testing but are not required to close.

*What measures should be taken when a student, teacher or staff member has symptoms, is a contact of someone infected, or is diagnosed with COVID-19?*

	Student or Staff with:	Action	Communication
1.	<p>COVID-19 Symptoms (e.g., fever, cough, loss of taste or smell, difficulty breathing)</p> <p>Symptom Screening: Per CA <a href="#">School Sector Specific Guidelines</a></p>	<ul style="list-style-type: none"> <li>• Send home</li> <li>• Recommend testing (If positive, see #3, if negative, see #4)</li> <li>• School/classroom remain open</li> </ul>	<ul style="list-style-type: none"> <li>• No Action needed</li> </ul>
2.	Close contact <b>(+)</b> with a confirmed COVID-19 case	<ul style="list-style-type: none"> <li>• Send home</li> <li>• Quarantine for 14 days from last exposure</li> <li>• Recommend testing (but will not shorten 14-day quarantine)</li> <li>• School/classroom remain open</li> </ul>	<ul style="list-style-type: none"> <li>• Consider school community notification of a known contact</li> </ul>
3.	Confirmed COVID-19 case infection	<ul style="list-style-type: none"> <li>• Notify the local public health department</li> <li>• Isolate case and exclude from school for 10 days from symptom onset or test date</li> <li>• Identify contacts <b>(+)</b>, quarantine &amp; exclude exposed contacts (likely entire cohort <b>(++)</b>) for 14 days after the last date the case was present at school while infectious</li> <li>• Recommend testing of contacts, prioritize symptomatic contacts (but will not shorten 14-day quarantine)</li> <li>• Disinfection and cleaning of classroom and primary spaces where case spent significant time</li> <li>• School remains open</li> </ul>	<ul style="list-style-type: none"> <li>• School community notification of a known case</li> </ul>
4.	Tests negative after symptoms	<ul style="list-style-type: none"> <li>• May return to school 3 days after symptoms resolve</li> <li>• School/classroom remain open</li> </ul>	<ul style="list-style-type: none"> <li>• Consider school community notification if prior awareness of testing</li> </ul>





(†) A contact is defined as a person who is <6 feet from a case for >15 minutes. In some school situations, it may be difficult to determine whether individuals have met this criterion and an entire cohort, classroom, or other group may need to be considered exposed, particularly if people have spent time together indoors.

(††) A cohort is a stable group with fixed membership that stays together for all courses and activities (e.g., lunch, recess, etc.) and avoids contact with other persons or cohorts.

### Guidance on School Closure

*What are the criteria for closing a school?*

Individual school closure is recommended based on the number of cases, the percentage of the teacher/students/staff that are positive for COVID-19, and following consultation with the Local Health Officer. Individual school closure may be appropriate when there are multiple cases in multiple cohorts at a school or when at least 5 percent of the total number of teachers/student/staff are cases within a 14-day period, depending on the size and physical layout of the school.

The Local Health Officer may also determine school closure is warranted for other reasons, including results from public health investigation or other local epidemiological data.

*If a school is closed for in-person learning, when may it reopen?*

Schools may typically reopen after 14 days and the following have occurred:

- Cleaning and disinfection
- Public health investigation
- Consultation with the local public health department

*What are the criteria for closing a school district?*

A superintendent should close a school district if 25% or more of schools in a district have closed due to COVID-19 within 14 days, and in consultation with the local public health department.

*If a school district is closed, when may it reopen?*

Districts may typically reopen after 14 days, in consultation with the local public health department.

State Resources for Case, Contact & Outbreak Investigations

California is committed to supporting local health departments with resources and other technical assistance regarding school case, contact, and outbreak investigations.



1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**  
 16 Plaintiffs,  
 17 v.  
 18 **GAVIN NEWSOM, et al.**  
 19 Defendants.

20 Case No.: 2:20-cv-06472 DDP (AFMx)

21 **DECLARATION OF DR.**  
 22 **JAYANTA BHATTACHARYA IN**  
 23 **SUPPORT OF MOTION FOR**  
 24 **PRELIMINARY INJUNCTION**

25 Judge: Hon. Dean D. Pregerson

26 Jayanta Bhattacharya declares, pursuant to 28 U.S.C. § 1746:

27 1. I am a resident of Los Altos, California, I am 52-years-old, and I am  
 28 otherwise competent to render this declaration.

2. I am a Professor of Medicine at Stanford University and have worked on the  
 Stanford University faculty since 2001. I hold an M.D. and a Ph.D. in economics, both  
 earned from Stanford University. I am the director of the Stanford Center for



1 Demography and Economics of Health and Aging. At Stanford, I teach courses on health  
2 economics in the Economics department and on advanced statistical methods in the  
3 School of Medicine.

4 3. My primary research area is health economics, including a focus on  
5 economic epidemiology. Between 1996 and 2020, I have published 136 articles in peer-  
6 reviewed journals, including top-ranked journals in the economics, statistics, public  
7 health, epidemiology, medicine, and health policy literatures. I have published numerous  
8 papers on the economics and medicine of infectious disease, including on the economics  
9 and epidemiology of HIV, H1N1 flu, H5N1 flu, seasonal influenza, antimicrobial  
10 resistance and antibiotic use, and COVID-19. I have written a popular textbook, *Health*  
11 *Economics*, used to teach the subject in universities around the world. The textbook  
12 includes a chapter on economic epidemiology that surveys the literature on disease  
13 modeling, including compartment models such as the Susceptible-Infected-Recovered  
14 (SIR) models, commonly in use to forecast the COVID-19 epidemic.

15 4. I have been actively researching the COVID-19 epidemic using my  
16 expertise in infectious disease epidemiology and health economics. To date, I have  
17 published two papers in peer-reviewed journals related to the epidemic, In addition, I  
18 have written three articles that are currently under consideration at peer-reviewed  
19 journals, and I have published three editorials on economic<sup>1</sup> and epidemiological<sup>2</sup> issues  
20 related to the epidemic, including an editorial<sup>3</sup> on optimal public health management of  
21 the epidemic.

22  
23 <sup>1</sup> Jay Bhattacharya and Mikko Packalen, *Lives vs Lives: The Global Cost of Lockdown*,  
24 Spectator USA, <https://spectator.us/lives-vs-lives-global-cost-lockdown/> (last visited  
25 July 9, 2020).

26 <sup>2</sup> Eran Bendavid and Jay Bhattacharya, *Is the Coronavirus as Deadly as They Say?*,  
27 WSJ Opinion, <https://www.wsj.com/articles/is-the-coronavirus-as-deadly-as-they-say-11585088464>  
(March 24, 2020).

28 <sup>3</sup> Jay Bhattacharya and Sanjiv Agarwal, Lift lockdowns, protect the vulnerable, treat  
Covid like a health issue and not a disaster, The Print, <https://theprint.in/health/lift->

1           5. My published papers on COVID-19 includes the first published serological  
2 study measuring the prevalence of the COVID-19 epidemic. This study, conducted in LA  
3 County, uses evidence from a specific antibody response to SARS-CoV-2 (the virus that  
4 causes COVID-19) infection in an adult community-dwelling sample picked to be  
5 representative of the county. This piece was published in the *Journal of the American*  
6 *Medical Association*, one of the leading peer-reviewed journals in medicine. This paper  
7 finds that by April 10 - 11, 2020, 4.3% of LA County adults show specific antibody  
8 evidence of prior or current COVID-19 infection. This prevalence rate represents a  
9 multiple of 43.5 times the number of cases confirmed by the county public health  
10 authority by that date. One important implication of this paper is that the infection fatality  
11 rate from COVID-19 infection in LA County up to the date of the survey (that is, the  
12 probability of dying given that a person is infected with SARS-CoV-2) is at least an order  
13 of magnitude lower than the case fatality rate. The case fatality rate includes only patients  
14 who were infected with SARS-CoV-2 and identified as a case in the denominator of the  
15 calculation. Cases most typically include patients who have severe symptoms and thus  
16 come to the attention of medical authorities. Our study shows that cases represent only a  
17 small fraction of the set of people who have been infected with SARS-CoV-2. I served  
18 as the senior author for this article.

19           6. I have also published a second peer-reviewed paper in the *Journal of Public*  
20 *Health* on racial disparities in knowledge and attitudes regarding the danger posed by  
21 COVID-19 infection and the efficacy of personal behaviors like hand washing and social  
22 distancing in protecting against infection. I reviewed the literature cited in the paper  
23 regarding best practices for personal protection to prevent exposure to SARS-CoV-2.

24           7. I currently have three unpublished papers on COVID-19 presently  
25 undergoing peer review. These include two papers reporting on seroprevalence studies  
26 and a third paper using data from seroprevalence studies in the context of an SIR model

27 \_\_\_\_\_  
28 [lockdowns-protect-the-vulnerable-treat-covid-like-a-health-issue-and-not-a-disaster/466786/](#) (last visited July 26, 2020)

1 to forecast the spread of COVID-19 in a way that accounts for the large number of  
2 asymptomatic patients.

3 8. First, I am the senior author of the Santa Clara County seroprevalence study.  
4 It is the first seroprevalence study where the study team made a scientific paper available  
5 (undergoing peer review), and it is still, to my knowledge, the largest community  
6 seroprevalence survey in the US. The results from Santa Clara County (SCC) were  
7 similar to the results from the LA County seroprevalence study. On April 3<sup>rd</sup> & 4<sup>th</sup>, 2020,  
8 the seroprevalence of SARS-CoV-2 antibodies in the SCC sample, reweighted to match  
9 the zip code of residence, sex, and race distribution of SCC, was 2.8%. The Santa Clara  
10 study has been enormously influential and has served as a template for the many  
11 seroprevalence studies that have followed it. The preprint article reporting on the Santa  
12 Clara study, though not peer-reviewed, has generated 147 citations (according to Google  
13 Scholar accessed on July 9, 2020) to date.

14 9. Second, I am the senior author of a study (still undergoing peer review)  
15 measuring the seroprevalence of SARS-CoV-2 infection among employees of Major  
16 League Baseball on April 14<sup>th</sup> & 15<sup>th</sup>, 2020. This is the first seroprevalence study of  
17 national scope measuring the extent of COVID-19. The main finding from that study is  
18 that, as of the date of data collection, the prevalence of current or prior COVID-19  
19 infection in the MLB employee population was 0.7%.

20 10. Finally, I am a co-author of a preprint paper (still undergoing peer review)  
21 titled "Visualizing the Invisible: The Effect of Asymptomatic Transmission on the  
22 Outbreak Dynamics of COVID-19." This paper presents the first forecasting model that  
23 accounts for data provided by seroprevalence studies such as the LA County, Santa Clara  
24 County, and MLB studies. In particular, the model accounts for the vast population of  
25 previously infected people identified by the seroprevalence studies and challenges the  
26 notion that contact tracing can be a viable strategy to control the further spread of  
27 COVID-19 infection.

28



1           11. In addition to my published work, over the past three months, I have been  
2 invited to serve as a peer reviewer for several scientific journals to review COVID-19  
3 related submissions by other scientists. These journals include the *British Medical*  
4 *Journal*, *Health Affairs*, the *Journal of Infectious Disease*, and the *Annals of Internal*  
5 *Medicine*. For these journals, I have provided scientific advice regarding the publication  
6 of articles on topics related to the COVID-19 epidemic.

7           12. In May 2020, I testified at a virtual roundtable organized by Senator Pat  
8 Toomey on the subject of the potential reopening of youth baseball leagues while  
9 protecting the safety of participants. At this roundtable, I reviewed the evidence regarding  
10 the relatively low mortality and morbidity risk that SARS-CoV-2 infection poses to  
11 children and adolescents, and I discussed social distancing and other protocols to make  
12 youth baseball safer for coaches, umpires, and other adult participants.

13           13. In July 2020, I was invited to testify at a House Oversight Briefing to the  
14 Economic and Consumer Policy Subcommittee on SARS-CoV-2 vaccine development.  
15 My testimony focused on the randomized trials and other studies currently underway to  
16 produce a safe and effective vaccine to SARS-CoV-2 infection, and in particular on the  
17 confidence that the public can have on the US Food and Drug Administration's (FDA)  
18 evaluation of the scientific evidence regarding new vaccines.

19           14. Plaintiffs in this case contacted me about providing expert testimony  
20 regarding the risks of opening schools in California this Fall, and I agreed to provide an  
21 affidavit with my professional opinion on these matters. I am not taking any personal  
22 payments for my COVID-19 related work, so my work on this affidavit is pro-bono.

23           15. To prepare this affidavit, I have reviewed the Governor's Executive Order  
24 N-60-20 and the July 17, 2020 "COVID-19 Industry Guidance: School and School-Based  
25 Programs." I have also closely studied the scientific data on COVID-19. I have  
26 compared the Governor's July 17<sup>th</sup> order against guidelines provided by both the World  
27 Health Organization (WHO) and the US Centers for Disease Control (CDC) for school  
28

1 reopening. My main conclusion is that there is no scientific basis for closing schools  
2 across the state this Fall.

3 16. The World Health Organization (WHO) guidance<sup>4</sup> on school opening  
4 emphasizes that school opening decisions be based on the “Current understanding about  
5 COVID-19 transmission and severity in children”, the “Local situation and epidemiology  
6 of COVID-19 where the school(s) are located “, and the “School setting and ability to  
7 maintain COVID-19 prevention and control measure”. The WHO guidance explicitly  
8 recommends the consideration of “what harm might occur due to school closure (e.g. risk  
9 of non-return to school, widening disparity in educational attainment, limited access to  
10 meals, domestic violence aggravated by economic uncertainties etc.), and the need to  
11 maintain schools at least partially open for children whose caregivers are ‘key workers’  
12 for the country.”

13 17. The US Centers for Disease Control (CDC) March 12<sup>th</sup>, 2020 interim  
14 guidance<sup>5</sup> concurs with the WHO guidance document, with an emphasis on accounting  
15 for local conditions regarding disease spread and providing concrete guidance on steps  
16 to take (masks, social distancing, staff training, and the like) to open schools safely. The  
17 interim guidance suggests keeping schools open even if there is moderate community  
18 spread of SARS-CoV-2 infection, with school closures limited only to communities with  
19 “substantial” community spread.

20  
21  
22  
23  
24 <sup>4</sup> World Health Organization (2020) Considerations for school-related public health  
25 measures in the context of COVID-19.

26 <https://www.who.int/publications/i/item/considerations-for-school-related-public-health-measures-in-the-context-of-covid-19>

27 <sup>5</sup> Centers for Disease Control (2020) Interim Guidance for Administrators of US K-12  
28 Schools and Child Care Programs. <https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/guidance-for-schools.html>

1           18. The US CDC July 23<sup>rd</sup>, 2020 guidance<sup>6</sup> on school opening (entitled “The  
2 Importance of Reopening Schools this Fall”) emphasizes the well-documented benefits  
3 of keeping schools open. Among the harms of extended school closure include: (1)  
4 “severe learning loss” for all students, but especially students with special needs and  
5 disabilities; (2) widening of income and racial disparities in educational outcomes for  
6 children; (3) hampered development of social and emotional skills by children and  
7 potential harm to child mental health; (4) exposure of children to heightened risk of  
8 “physical, sexual, and emotional maltreatment and abuse” at home from some families;  
9 (5) nutritional deprivation of poor children due to the cessation of school meal programs;  
10 and (6) sharp reduction in regular physical activity by children in the absence of physical  
11 education programs. Crucially, the CDC recommends that these harms be taken into  
12 account in school closure decisions. The guidance document closes by suggesting that  
13 “[r]eopening schools creates opportunity to invest in the education, well-being, and future  
14 of one of America’s greatest assets—our children—while taking every precaution to  
15 protect students, teachers, staff and all their families.”

16           19. Governor Newsom’s Executive Order N-60-20<sup>7</sup>, issued on May 4<sup>th</sup>, 2020,  
17 did not specifically mention schools, but invested power in the State Public Health  
18 Officer to make determinations about the re-openings of “businesses and spaces” that are  
19 more restrictive than those made by local county public health authorities. Under this  
20 authority, on July 17<sup>th</sup>, 2020, the California Department of Public Health forced the  
21 closure of all schools in California counties that have been on the state’s county  
22 monitoring list.<sup>8</sup>

23 \_\_\_\_\_  
24 <sup>6</sup> Centers for Disease Control (2020) The Importance of Reopening America’s Schools  
25 this Fall. [https://www.cdc.gov/coronavirus/2019-ncov/community/schools-  
childcare/reopening-schools.html](https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/reopening-schools.html)

26 <sup>7</sup> Newsom G (2020) Executive Order N-60-20. [https://www.gov.ca.gov/wp-  
content/uploads/2020/05/5.4.20-EO-N-60-20-text.pdf](https://www.gov.ca.gov/wp-content/uploads/2020/05/5.4.20-EO-N-60-20-text.pdf)

27 <sup>8</sup> California Department of Public Health (2020) COVID-19 and Reopening In-Person  
28 Learning: Framework for K-12 Schools in California, 2020-2021 School Year.

1           20. The state places a county on this list if it meets at least one of six criteria  
2 related to the number of COVID-19 PCR tests conducted or positivity rate, number of  
3 cases and growth in cases, growth in hospitalizations, or inadequate hospital ICU or  
4 ventilator capacity. None of these criteria are related to the risks to children or to teachers  
5 that arise from reopening schools for in-person teaching. The scientific evidence indicates  
6 that a county could meet all six criteria for closing schools, and the marginal public health  
7 risk from conducting school in-person would be small. In particular, the order ignores the  
8 evidence that the mortality risk and severe adverse health outcome risk to children from  
9 COVID-19 disease is small or negligible. The order ignores the fact that children are  
10 exceedingly unlikely to pass the virus on to adults. The evidence on these points are  
11 covered extensively below. The order ignores the fact that keeping schools closed results  
12 in public health harm to children outlined in the WHO's guidance on school opening  
13 discussed in paragraph 16 above, and the CDC's guidance on school opening discussed  
14 in paragraph 18 above. The governor's executive order thus ignores the recommendations  
15 of both the CDC and the WHO that school reopening decisions take account of the latest  
16 scientific evidence on risk to children and viral transmission dynamics, relevant local  
17 conditions, and the public health harm arising from keeping schools closed.

18           21. In the paragraphs that follow, drawn both from my own work and from the  
19 scientific literature on COVID-19, I discuss (1) the relative risk that young people (below  
20 age 25) with active SARS-CoV-2 infection pose with regard to infecting older people;  
21 (2) the mortality risk from COVID-19 infection for patients of different ages; and (3) the  
22 public health community's approval of the principle that individuals and groups may  
23 appropriately take actions that raise the risk of COVID-19 infection if the value provided  
24 by those actions to participants is sufficiently large to outweigh the infection-related  
25 harms.

26  
27  
28 <https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/COVID-19/Schools%20Reopening%20Recommendations.pdf>

1           22. The overwhelming weight of scientific data suggests that the risk of  
2 transmission of the virus from younger people aged 20 and below to older people is small  
3 or negligible, and the risk of transmission from people 20 to 25 to older people is small  
4 relative to the risk of transmission from people older than 25 to others older than 25.

5           23. The most important evidence on childhood spread of the disease comes from  
6 a study conducted in Iceland and published in the *New England Journal of Medicine*.<sup>9</sup>  
7 The data for this study come from Iceland's systematic screening of its population to  
8 check for the virus. The study reports on both a population-representative sample and a  
9 sample of people who were tested because of the presence of symptoms consistent with  
10 COVID-19 infection. The study team isolated SARS-CoV-2 virus samples from every  
11 positive case, sequenced the genome of the virus for every case, and tracked the mutation  
12 patterns in the virus. This analysis, along with contact tracing data, allowed the study  
13 team to identify who passed the virus to whom. From this analysis, the senior author of  
14 the study, Dr. Kari Stefansson, concluded<sup>10</sup> that "[E]ven if children do get infected, they  
15 are less likely to transmit the disease to others than adults. We have not found a single  
16 instance of a child infecting parents. There is amazing diversity in the way in which we  
17 react to the virus."

18           24. A French study,<sup>11</sup> conducted by scientists at the L'Institut Pasteur, examined  
19 data from school-teachers, students, and their parents in Crepy-en-Valois in France.  
20 Collecting data in late April 2020, the authors found that 61% of the parents of infected  
21

22 <sup>9</sup> Daniel F. Gudbjartsson, Ph.D., Agnar Helgason, Ph.D., et al., *Spread of SARS-CoV-2*  
23 *in the Icelandic Population*, *The New England Journal of Medicine*,  
<https://www.nejm.org/doi/full/10.1056/NEJMoa2006100> (June 11, 2020).

24 <sup>10</sup> Roger Highfield, *Coronavirus: Hunting Down COVID-10*, Science Museum Group,  
25 <https://www.sciencemuseumgroup.org.uk/blog/hunting-down-covid-19/> (April 27,  
2020).

26 <sup>11</sup> Arnaud Fontanet, MD, DrPH, Rebecca Grant, et al., *SARS-CoV-2 Infection in Primary*  
27 *Schools in Northern France: A Retrospective Cohort Study in an Area of High*  
28 *Transmission*, Institut Pasteur, <https://www.pasteur.fr/fr/file/35404/download> (last  
visited July 9, 2020).

1 students were infected by SARS-CoV-2, while 6.9% of parents of non-infected students  
2 were infected. The schools in France were closed from the end of January on, at first  
3 because of February holiday and then the late February lockdown. The authors found  
4 three cases among kids in January using antibody tests but found no evidence of virus  
5 spread to other kids or teachers from those early cases. Any spread between the end of  
6 January and the end of April (when the authors collected samples) must have occurred  
7 during the lockdown. The kids who tested antibody positive at the end of April, because  
8 of the circumstances of the lockdown, must have become positive from a source other  
9 than their school. The main contacts of the young children were their parents, of whom  
10 61% were positive, which is consistent with parent to child spread. Also consistent is the  
11 fact that only 6.9% parents tested positive in April for the virus among the kids who were  
12 antibody negative. The authors' main conclusion<sup>12</sup> from these facts is that parents were  
13 the source of infections in school children; children were not the source. This finding  
14 bolsters the conclusion from the Icelandic study that the disease spreads less easily from  
15 children to adults than it does from adults to adults.

16 25. Researchers in Ireland conducted a similar but smaller study<sup>13</sup> that  
17 exhaustively tracked the contacts of three schoolchildren (10-15 years old) and three  
18 adults (including one teacher and two adult students). All six patients had confirmed cases  
19 of COVID-19 disease but were found to have contracted the virus from contacts outside  
20 of the school setting. Despite identifying a total of 722 contacts, the study authors  
21 reported finding no instance of an infected child infecting another child. The infected  
22

23 <sup>12</sup> *COVID-19 In Primary Schools: No Significant Transmission among Children or*  
24 *From Students to Teachers*, Institut Pasteur, [https://www.pasteur.fr/en/press-area/press-](https://www.pasteur.fr/en/press-area/press-documents/covid-19-primary-schools-no-significant-transmission-among-children-students-teachers)  
25 [documents/covid-19-primary-schools-no-significant-transmission-among-children-](https://www.pasteur.fr/en/press-area/press-documents/covid-19-primary-schools-no-significant-transmission-among-children-students-teachers)  
[students-teachers](https://www.pasteur.fr/en/press-area/press-documents/covid-19-primary-schools-no-significant-transmission-among-children-students-teachers) (June 23, 2020).

26 <sup>13</sup> Laura Heavey, Geraldine Casey, et al., *No Evidence of Secondary Transmission of*  
27 *COVID-19 from Children Attending School in Ireland, 2020*, Eurosurveillance,  
28 [https://www.eurosurveillance.org/content/10.2807/1560-](https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.21.2000903#html_fulltext)  
[7917.ES.2020.25.21.2000903#html\\_fulltext](https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.21.2000903#html_fulltext) (May 28, 2020).



1 adults, by contrast, had many fewer contacts – 102 – but did pass on the infection to a  
2 few adult contacts.

3 26. A report<sup>14</sup> by the ministry of health in the Netherlands, based on contact  
4 tracing data, finds almost no disease spread by infected patients 20 and under at all, and  
5 only limited spread by adults 20-25 to others outside their own age category. The authors  
6 of the study concluded: “Data from the Netherlands also confirms the current  
7 understanding: that children play a minor role in the spread of the novel coronavirus. The  
8 virus is mainly spread between adults and from adult family members to children. The  
9 spread of COVID-19 among children or from children to adults is less common.”

10 27. A German<sup>15</sup> study reports a strikingly similar finding on the likelihood of  
11 pediatric disease spread. The German Society for Pediatric Infectious Diseases collected  
12 on all children and adolescents admitted to a hospital for COVID-19 treatment between  
13 mid-March and early May 2020 – 128 patients in all, admitted to 66 different hospitals.  
14 The authors were able to find the source of infection for 38% of these patients, which  
15 turned out to be a parent 85% of the time. Though the authors document a limitation of  
16 small sample size, they conclude that “In contrast to other epidemic viral respiratory  
17 infections, the primary source of infection with SARS-CoV-2 appears not to be other  
18 children.” The authors reported a single death among these 128 pediatric patients.

19 28. The National Academies of Sciences, Engineering, and Medicine convened  
20 the Committee on Guidance for K-12 Education on Responding to COVID-19 in May  
21 2020 to review the science regarding the public health costs and benefits of school  
22 reopening and to make recommendations about best practices for reopening, completing  
23

24 <sup>14</sup> *Children and COVID-19*, National Institute for Public Health and the Environment,  
25 <https://www.rivm.nl/en/novel-coronavirus-covid-19/children-and-covid-19> (July 2,  
26 2020).

27 <sup>15</sup> Armann, J. P., Diffloth, N., Simon, A., Doenhardt, M., Hufnagel, M., Trotter, A.,  
28 Schneider, D., Hübner, J., & Berner, R. (2020). Hospital Admission in Children and  
Adolescents With COVID-19. *Deutsches Arzteblatt international*, 117(21), 373–374.  
<https://doi.org/10.3238/arztebl.2020.0373>

1 its report<sup>16</sup> in July 2020. The report emphasizes the need to balance the public health risk  
2 from school re-opening against the long term harm arising children missing in-person  
3 instruction. The report points to the inequitable harm posed on minority students from  
4 closing schools. The report recommends prioritizing in-person instruction for K-5  
5 students and special needs students and provides concrete mitigation strategies (such as  
6 masks) to support school reopening. Though the report calls for further research on the  
7 likelihood of disease spread, it does not review many of the European studies that I review  
8 in my declaration.

9 29. A recent South Korean contact tracing study<sup>17</sup> was cited in the New York  
10 Times as providing evidence that “Older Children Spread the Coronavirus Just as Much  
11 as Adults.” The study authors traced the 59,073 contacts of 5,706 COVID-19 patients,  
12 confirmed by PCR to be infected. The authors divide up their patients into 10-year age  
13 bins, and report the fraction of contacts in each bin who also tested positive. The authors  
14 report that among 0-9-year-old cases, 5.3% of household contacts tested positive, while  
15 among 10-19-year-old cases, 18.6% of household contacts tested positive (in both groups,  
16 only about 1% of non-household contacts tested positive.

17 30. Contrary to the interpretation of the NYT headline, this pattern of evidence  
18 does not imply that older children spread the corona virus as much as adults. First, the  
19 authors define an index case as “the first identified laboratory-confirmed case or the first  
20 documented case in an epidemiologic investigation within a cluster.” In other words, they  
21 cannot tell whether an index case was the first person within a cluster to be infected – just  
22 that they were the first to come to the attention of public health authorities. Unlike the

23 <sup>16</sup> National Academies of Sciences, Engineering, and Medicine. 2020. Reopening K-12  
24 Schools During the COVID-19 Pandemic: Prioritizing Health, Equity, and  
25 Communities. Washington, DC: The National Academies Press.  
<https://doi.org/10.17226/25858>.

26 <sup>17</sup> Park YJ, Choe YJ, Park O, Park SY, Kim YM, Kim J, et al. Contact tracing during  
27 coronavirus disease outbreak, South Korea, 2020. *Emerg Infect Dis*. 2020 Oct (accessed  
28 online July 27, 2020) . <https://doi.org/10.3201/eid2610.201315>

1 Icelandic study, referenced in paragraph 23, the authors of the South Korean study do not  
2 sequence the genome of the viruses identified to document mutation patterns.  
3 Consequently, they cannot distinguish whether the index patient passed the virus to the  
4 contact or the other way around. Second, the authors report that children 0-9 years old  
5 represented only 0.5% of their index cases and children 10-19 years old represented only  
6 2.2% of their index cases. The vast majority of their cases were 20 years old or older. The  
7 study data collection took place during a period of strict lockdown and school closure in  
8 South Korea. It is highly unlikely that these few index children spread the disease  
9 throughout their cluster. The authors document that adults are more likely to have  
10 contacts outside their household than children during this period. It is far more likely that  
11 older members of households were the true index cases and spread the infection to  
12 children within the household. Third, the authors report that 7% of household contacts of  
13 20-29 year olds were infected. This is less than the positive case rate for 10-19 year olds.  
14 If the higher rate of infections among household contacts of 10-19 year olds is evidence  
15 of increased transmissibility, then the low rate of infections among households of 20-29  
16 year olds should be taken as evidence of decreased transmissibility for patients in that  
17 age group. A better interpretation is that the study methods of this paper do not permit  
18 any inference whatsoever about the relative propensity of children and adults to transmit  
19 the disease.

20 31. In the paragraphs that follow, I review evidence on the size of the mortality  
21 risk with respect to COVID-19 infection. The best evidence on the infection fatality rate  
22 from SARS-CoV-2 infection (that is, the fraction of infected people who die due to the  
23 infection) comes from seroprevalence studies. The definition of seroprevalence of  
24 COVID-19 is the fraction of people within a population who have specific antibodies  
25 against SARS-CoV-2 in their bloodstream. Seroprevalence studies provide better  
26 evidence on the total number of people who have been infected than do case reports,  
27 which miss infected people who are not identified by the public health authorities.

28

1 Because they ignore unreported cases in the denominator, fatality rate estimates based on  
2 case reports are substantially biased upwards.

3 32. According to a meta-analysis<sup>18</sup> by Dr. John Ioannidis of every  
4 seroprevalence study conducted with a supporting scientific paper (50 estimates in total  
5 from 32 different localities around the world), the median infection fatality rate from  
6 COVID-19 infection is 0.27%. For COVID-19 patients under 70, the meta-analysis finds  
7 an infection fatality rate of 0.05%, with a range between 0.00% to 0.57% in different  
8 locations. A newly released meta-analysis<sup>19</sup> by scientists independent of Dr. Ioannidis'  
9 group, published in the National Bureau of Economic Research working paper series,  
10 reaches qualitatively similar conclusions.

11 33. A recent US Centers for Disease Control (CDC) report<sup>20</sup> found that there  
12 were between six and 24 times more SARS-CoV-2 infections than cases reported  
13 between March and May 2020. This study is based on serological analysis of blood  
14 samples incidentally collected by commercial laboratories in 10 cities nationwide.  
15 Though the CDC does not provide the infection fatality rate estimate implied by their  
16 seroprevalence estimate in their report, the multiplier to cases they report is in line with  
17 the seroprevalence studies reviewed by Dr. Ioannidis above, which imply an infection  
18 fatality rate between 2 and 3 in 1,000.

19  
20  
21  
22 <sup>18</sup> John P.A. Ioannidis, *The Infection Fatality Rate of COVID-19 Inferred from*  
23 *Seroprevalence Data*, medRxiv,  
24 <https://www.medrxiv.org/content/10.1101/2020.05.13.20101253v2.full.pdf> (July 14,  
2020).

25 <sup>19</sup> Levin AT, Cochran KB, Walsh SP (2020) Assessing the Age Specificity of Infection  
26 Fatality Rates for COVID-19: Meta-Analysis & Public Policy Implications. National  
27 Bureau of Economic Research Working Paper #27597.

28 <sup>20</sup> Havers FP, Reed C, Lim T, et al. Seroprevalence of Antibodies to SARS-CoV-2 in 10  
Sites in the United States, March 23-May 12, 2020. *JAMA Intern Med*. Published online  
July 21, 2020. doi:10.1001/jamainternmed.2020.4130

1           34. In May 2020, the CDC released guidance<sup>21</sup> for pandemic planning scenario  
2 that included its best estimate of the infection fatality rate in the US, of 0.26%. The CDC's  
3 estimate of the symptomatic fatality rate among diagnosed cases was 0.4%, and they  
4 estimated about 65% of all cases are symptomatic, which implies an infection fatality rate  
5 estimate of  $0.4\% * 0.65 = 0.26\%$ .

6           35. By contrast, the CDC estimated<sup>22</sup> that the symptomatic fatality rate from  
7 influenza infection of 0.13% and 0.10% during the 2017-18 and 2018-19 seasons,  
8 respectively. These figures should be compared against the symptomatic fatality rate for  
9 COVID-19 reported by the CDC (0.4%) rather than the infection fatality rate (0.26%).  
10 To my knowledge the CDC has not provided a publicly available estimate of the infection  
11 fatality rate for the flu during those seasons. Here, the symptomatic fatality rate represents  
12 the probability that a patient infected with the flu virus with some flu symptoms dies from  
13 the flu, while the infection fatality rate indicates the probability that a patient infected  
14 with influenza, either with or without symptoms, dies from the flu.

15           36. In mid-July, the CDC updated its pandemic planning site and revised its  
16 preferred estimate of IFR upward to 0.65%.<sup>23</sup> In support of this revision, the CDC cited  
17 an pre-print meta-analysis of 25 infection fatality rate estimates.<sup>24</sup> This meta-analysis  
18 includes IFR estimates provided in modeling papers (based on no direct empirical data)

19 \_\_\_\_\_  
20 <sup>21</sup> *COVID-19 Pandemic Planning Scenarios*, Centers for Disease Control and  
Prevention, (May 20, 2020).

21 <https://web.archive.org/web/20200706205612/https://www.cdc.gov/coronavirus/2019-ncov/hcp/planning-scenarios.html>. Accessed through the internet archive site,  
22 <https://web.archive.org>.

23 <sup>22</sup> *Disease Burden of Influenza*, Centers for Disease Control and Prevention,  
24 <https://www.cdc.gov/flu/about/burden/index.html> (last visited on July 9, 2020).

25 <sup>23</sup> *COVID-19 Pandemic Planning Scenarios*, Centers for Disease Control and  
Prevention, (July 10, 2020). <https://www.cdc.gov/coronavirus/2019-ncov/hcp/planning-scenarios.html>  
26

27 <sup>24</sup> Meyerowitz-Katz, G., & Merone, L. (2020). A systematic review and meta-analysis  
of published research data on COVID-19 infection-fatality rates. *medRxiv*.

28 <https://www.medrxiv.org/content/10.1101/2020.05.03.20089854v4>

1 and observational studies that do not adequately consider undiagnosed infections.  
2 Though the meta-analysis does consider 9 seroprevalence studies among its sources, it  
3 arbitrarily restricts attention to only seroprevalence studies reported by a select set of  
4 governments, while ignoring the much larger set of seroprevalence studies (including  
5 peer-reviewed studies) cited by Prof. Ioannidis in his report cited in paragraph 30 above.

6 37. The mortality risk for those infected with SARS-CoV-2 is not the same for  
7 all patients. Older patients are at substantially higher risk of death if infected, while  
8 younger patients face a vanishingly small risk. The best evidence on age-specific  
9 infection fatality rates comes again from seroprevalence studies. Three such studies (of  
10 which I am currently aware) provide age-specific infection fatality rate estimates. The  
11 CDC's current best estimates are that the symptomatic fatality rate from COVID-19  
12 among patients less than 50 years old is 0.05%, or 5 in 10,000; 0.2% for patients between  
13 ages 50 and 64; and 1.3% for patients 65 and above. The infection fatality rates are lower  
14 than these numbers since only a fraction of patients is symptomatic.

15 38. A study of the seroprevalence of COVID-19 in Geneva, Switzerland  
16 (published in the *Lancet*)<sup>25</sup> provides a detailed age break down of the infection fatality  
17 rate in a preprint companion paper:<sup>26</sup> 0.0016% for patients 5 to 9 years old (16 deaths per  
18 100,000 infections); 0.00032% for patients 10 to 19 years old (3.2 deaths per million  
19 infections); 0.0092% for patients 20 to 49 years old (92 deaths per 100,000 infections);  
20 0.14% for patients 50 to 64 years old (14 cases per 10,000 infections); and 5.6% for  
21 patients above 65.

22  
23  
24 <sup>25</sup> Silvia Stringhini, PhD, Ania Wisniak, MS, et al., *Seroprevalence of Anti-SARS-CoV-2 IgG Antibodies in Geneva, Switzerland (SEROCoV-POP): A Population Based Study*,  
25 The Lancet, [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)31304-0/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31304-0/fulltext) (June 11, 2020).

26  
27 <sup>26</sup> Francisco Perez-Saez, Stephen Lauer, et al., *Serology-Informed Estimates of SARS-COV-2 Infection Fatality Risk in Geneva, Switzerland*, OSFPREPRINTS,  
28 <https://osf.io/wdbpe/> (June 15, 2020).



1           39. For this affidavit, I estimated the age-specific infection fatality rates from  
2 the Santa Clara County seroprevalence study<sup>27</sup> data (for which I am the senior  
3 investigator). The infection fatality rate is 0% among people between 0 and 19 years  
4 (there were no deaths in Santa Clara in that age range up to that date); 0.013% for people  
5 between 20 and 39 years (1.3 deaths per 10,000 infections); 0.16% for people between  
6 40 and 69 years (1.6 deaths per 1,000 infections); and 1.3% for people above 70 years.  
7 In fact, in all of California<sup>28</sup> up through July 23rd, there have been no deaths at all among  
8 COVID-19 patients below 18. 77.5% of all COVID-19 related deaths occurred in patients  
9 65 and older.

10           40. In the preceding paragraphs, I have presented evidence that the risk of  
11 disease spread from younger people to older people is small, and that the risk of mortality  
12 to people under the age of 65 is on the order of 1 in 1,000 if someone does become  
13 infected (lower with younger age). The final question I address in my affidavit is a vital  
14 principle promoted by public health experts and the public health community that implies  
15 that certain action may be justified despite some public health risk if the action is  
16 sufficiently important to warrant it.

17           41. The Black Lives Matter (BLM) protests started nationwide shortly after the  
18 killing of George Floyd in Minnesota on May 25th, 2020. One press account<sup>29</sup> suggests  
19 that more than 26 million Americans nationwide (primarily in big cities, but also

20 \_\_\_\_\_  
21 <sup>27</sup> Eran Bendavid, MD, Bianca Mulaney, MS, et al., COVID-19 Antibody  
22 Seroprevalence in Santa Clara County, California, medRxiv preprint,  
<https://www.medrxiv.org/content/10.1101/2020.04.14.20062463v2> (April 30, 2020)

23 <sup>28</sup> Age Group in California, *Cases and Deaths Associated with COVID-19*, California  
24 Department of Public Health,  
[https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/COVID-19/COVID-19-Cases-  
by-Age-Group.aspx](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/COVID-19/COVID-19-Cases-by-Age-Group.aspx) (July 23, 2020).

25 <sup>29</sup> Matthew Wright, *Black Lives Matter Protests May be the Largest in U.S. History as*  
26 *More Than 26 Million Americans Have Been at the More Than 4, 700 Demonstrations*  
27 *Around the Country*, DailyMail.com, [https://www.dailymail.co.uk/news/article-  
8488409/BLM-protests-largest-U-S-history-26MILLION-Americans-attended.html](https://www.dailymail.co.uk/news/article-8488409/BLM-protests-largest-U-S-history-26MILLION-Americans-attended.html)  
28 (July 8, 2020).

1 elsewhere) have participated in at least one protest since the first protests started on May  
2 26<sup>th</sup>, 2020. Protest organizers have manifestly not followed WHO or CDC guidelines  
3 regarding the conduct of large scale events during the COVID-19 epidemic. Prominent  
4 public officials, including Los Angeles Mayor Eric Garcetti, have participated in BLM  
5 protests that violate guidelines regarding the use of masks<sup>30</sup> and maintained social  
6 distancing during large events.

7 42. The reaction<sup>31</sup> of many prominent voices<sup>32</sup> within the public health  
8 community to the BLM protests has emphasized the importance of the right of Americans  
9 concerned about racial injustice to protest despite COVID-19. Nearly 1,300 public health  
10 experts signed a public letter<sup>33</sup> supporting the right of BLM protestors to gather publicly  
11 because of their (the protestors' and the public health experts') deeply held opposition to  
12 systemic racism. The letter explicitly acknowledged that social distancing and public  
13 masking would minimize the spread of COVID-19 and urged "to the extent possible" that  
14 these practices be followed by demonstrators while recognizing that protestors would not  
15 always be able to follow these guidelines. The signatories, in effect, weighed the costs of

16 \_\_\_\_\_  
17 <sup>30</sup> Jaclyn Cosgrove, et al., *Mayor Garcetti takes a knee amid chants of 'Defund police!'*  
18 *at downtown L.A. protest*, Los Angeles Times,  
19 [https://www.latimes.com/california/story/2020-06-02/mayor-garcetti-takes-a-knee-](https://www.latimes.com/california/story/2020-06-02/mayor-garcetti-takes-a-knee-amid-chants-of-defund-police-at-downtown-l-a-protest)  
20 [amid-chants-of-defund-police-at-downtown-l-a-protest](https://www.latimes.com/california/story/2020-06-02/mayor-garcetti-takes-a-knee-amid-chants-of-defund-police-at-downtown-l-a-protest) (June 2, 2020).

21 <sup>31</sup> Rachel Weiner, *Political and Health Leaders' Embrace of Floyd Protests Fuels*  
22 *Debate Over Coronavirus Restrictions*, The Washington Post,  
23 [https://www.washingtonpost.com/health/political-and-health-leaders-embrace-of-floyd-](https://www.washingtonpost.com/health/political-and-health-leaders-embrace-of-floyd-protests-fuels-debate-over-coronavirus-restrictions/2020/06/11/9c60bca6-a761-11ea-bb20-ebf0921f3bbd_story.html)  
24 [protests-fuels-debate-over-coronavirus-restrictions/2020/06/11/9c60bca6-a761-11ea-](https://www.washingtonpost.com/health/political-and-health-leaders-embrace-of-floyd-protests-fuels-debate-over-coronavirus-restrictions/2020/06/11/9c60bca6-a761-11ea-bb20-ebf0921f3bbd_story.html)  
25 [bb20-ebf0921f3bbd\\_story.html](https://www.washingtonpost.com/health/political-and-health-leaders-embrace-of-floyd-protests-fuels-debate-over-coronavirus-restrictions/2020/06/11/9c60bca6-a761-11ea-bb20-ebf0921f3bbd_story.html) (June 11, 2020).

26 <sup>32</sup> Dan Diamond, *Suddenly, Public Health Officials Say Social Justice Matters More*  
27 *Than Social Distance*, Politico,  
28 <https://www.politico.com/news/magazine/2020/06/04/public-health-protests-301534>  
(June 4, 2020)

29 <sup>33</sup> *Open Letter Advocating for an Anti-Racist Public Health Response to Demonstrations*  
30 *Against Systemic Injustice Occurring During the COVID-19 Pandemic*, Google Drive,  
31 <https://drive.google.com/file/d/1Jyfn4Wd2i6bRi12ePghMHtX3ys1b7K1A/view> (last  
32 visited July 9, 2020).

1 the protests (some risk of COVID-19 disease spread and mortality) against the benefits  
2 (support for a cause they deem worthy) and concluded in favor of the BLM  
3 demonstrations.

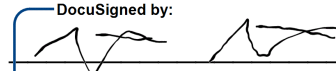
4 43. The principle the public letter supports is entirely reasonable: public health  
5 recommendations regarding behavior by private actors (such as the decision to protest)  
6 should weigh the benefits of that behavior against the public health costs. Though the  
7 signatories of the letter express their own support for the cause underlying the BLM  
8 protests, this principle cannot be contingent on their particular support of those activities.  
9 If this contingency were necessary, the charge by other public health experts<sup>34</sup> that the  
10 signatories are hypocritical in their support of masks, social distancing, and social  
11 isolation to reduce COVID-19 spread would be correct. If the benefits of the undertaking  
12 are important enough relative to the public health risks and care is taken to minimize  
13 those risks by adhering to the extent possible to safe practice guidelines promulgated by  
14 public health authorities, then the activity should receive approval by public health  
15 experts.

16 44. Many of California's schools were preparing to resume in-person education  
17 before the Governor issued his most recent guidance. The benefits of in-person schooling  
18 are well documented in the CDC and WHO guidance on school reopening (see  
19 paragraphs 16 and 18 above). Schools can adhere to the various CDC and WHO  
20 guidelines to a much greater extent than the BLM protests, which drew the support of  
21 public health experts despite the enhanced public health risk. Given these considerations  
22 – and the scientific evidence cited in this affidavit regarding disease spread and the  
23 COVID-19 infection fatality rate – I believe that it is a public health priority that most  
24 schools in California open safely this Fall.

25  
26  
27 <sup>34</sup> Joseph S. Ladapo, *The Coronavirus Credibility Gap*, WSJ Opinion,  
28 <https://www.wsj.com/articles/the-coronavirus-credibility-gap-11593645643> (July 1,  
2020).

1 I declare under penalty of perjury under the laws of the United States of America  
2 and the State of California that the foregoing is true and correct.

3  
4 Dated: July 27, 2020

DocuSigned by:  
  
5 Jayanta Bhattacharya, M.D., Ph.D.

6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF DR. SCOTT**  
 21 **ATLAS IN SUPPORT OF MOTION**  
 22 **FOR PRELIMINARY INJUNCTION**

Judge: Hon. Dean D. Pregerson

23 Scott W. Atlas declares, pursuant to 28 U.S.C. § 1746:

24 1. My name is Scott Atlas. I am a resident of Stanford, California; I am over  
25 18-years-old; and I am otherwise competent to make this declaration.

26 2. I am the Robert Wesson Senior Fellow at the Hoover Institution of Stanford  
27 University and former professor and Chief of Neuroradiology at Stanford University  
28 Medical Center from 1998 until 2012. I have served as a visiting professor at dozens of  
the top academic medical centers in the United States and throughout the world. A true  
and correct copy of my CV is attached as Exhibit 4.



1           3.     I received a BS degree in biology from the University of Illinois in Urbana-  
2 Champaign and an MD degree from the University of Chicago School of Medicine.

3           4.     In my profession and work, I investigate the impact of government and the  
4 private sector on access, quality, and pricing in health care, global trends in health care  
5 innovation, and key economic issues related to the future of technology-based medical  
6 advances. I have published more than 100 articles and books, including “Restoring  
7 Quality Health Care: A Six Point Plan for Comprehensive Reform at Lower Cost”  
8 (Hoover Institution Press, 2020, 2nd ed.) and “In Excellent Health: Setting the Record  
9 Straight on America’s Health Care System”. I have been interviewed by and had my  
10 work published in a variety of media, including BBC Radio, the PBS NewsHour, the  
11 Wall Street Journal, New York Times, Forbes Magazine, CNN, USA Today, Fox News,  
12 London’s Financial Times, Brazil’s Correio Braziliense, Italy’s Corriere della Sera,  
13 Argentina’s Diario La Nacion, and India's The Hindu.

14           5.     I am a frequent policy advisor to policymakers and government officials in  
15 the United States and in other countries, including serving as Senior Advisor for Health  
16 Care to a number of candidates for President of the United States, as well as having  
17 counselled members of the US Congress on health care, testified before Congress, and  
18 briefed directors of key agencies in the federal government.

19           6.     In the private sector, I am a frequent advisor to start-up entrepreneurs and  
20 companies in life sciences and medical technology. I am also the editor of the leading  
21 textbook in the field, Magnetic Resonance Imaging of the Brain and Spine, now in its  
22 fifth edition and previously translated from English into Mandarin, Spanish, and  
23 Portuguese. I have been an editor, an associate editor, and a member of the editorial and  
24 scientific boards of many journals as well as national and international scientific societies  
25 during the past three decades and I have written and published more than 120 peer  
26  
27  
28



1 reviewed scientific publications in leading journals. An abbreviated list of my  
2 publications can be found at: <https://profiles.stanford.edu/scott-atlas?tab=publications>.<sup>1</sup>

3 7. I agreed to be retained by Plaintiffs in this action to provide my professional  
4 opinion on the issues addressed in this lawsuit. I have studied in detail the data about the  
5 Covid-19 pandemic, including but not limited to the source data on the medical impact  
6 in the United States and in California, its impact on children, as well as the clinical science  
7 about the virus. In advance of preparing this Declaration, I have reviewed the Governor's  
8 Executive Order N-60-20 and the July 17, 2020 "COVID-19 Industry Guidance: School  
9 and School-Based Programs." Under the Governor's framework for reopening schools,  
10 a county must have been off the monitoring list for 14 consecutive days before *any* school  
11 within that county—public or private—is allowed to open. Although the Governor's plan  
12 includes a waiver procedure, it is unclear what criteria will be used to grant waivers. At  
13 present, California is the only state in the U.S. mandating at the state level that school  
14 districts not hold in-person classes, rather than leaving the decision to individual school  
15 districts. The Governor's order will thus impact millions of students from kindergarten  
16 through high school.

17 8. Despite the enormous consequences of the COVID-19 pandemic, the direct  
18 daily toll from the infection has generally decreased throughout the United States,  
19 including the epicenter of [New York](#)<sup>2</sup> and in the state of [California](#).<sup>3</sup> In most of the  
20 country and in California, the stated goal of societal lockdown – avoiding hospital  
21 overcrowding in in-patient and ICU bed occupancy - has been accomplished. Indeed, as  
22  
23  
24

25 <sup>1</sup> Scott W. Atlas, *Scott W. Atlas, Senior Fellow at The Hoover Institution*, Stanford  
26 Profiles, <https://profiles.stanford.edu/scott-atlas?tab=publications> (last visited July 25,  
27 2020).

28 <sup>2</sup> NYC.gov, *Covid-19: Data*, [https://www1.nyc.gov/site/doh/covid/covid-19-  
data.page](https://www1.nyc.gov/site/doh/covid/covid-19-data.page) (New York) (July 25, 2020).

<sup>3</sup> California Coronavirus, COVID-19 Statewide Update.  
<https://update.covid19.ca.gov/>

1 of July 24, 2020, the latest data, the hospital bed occupancy by Covid-19 patients in  
2 California is only about 11 percent ( [8,449](#) of [74,730](#) beds).<sup>4</sup>

3 9. In addition, today we should not, and need not, rely on hypothetical models  
4 and theoretical projections because we have extensive evidence about the threat from  
5 this coronavirus and who it targets. By now, numerous studies from [Europe](#)<sup>5</sup>, Japan, and  
6 the [US](#)<sup>6</sup> all suggest that the overall fatality rate is far lower than early estimates, likely  
7 below 0.1 to 0.4%, i.e., ten to forty times lower than estimates that motivated extreme  
8 isolation. The most recent [studies](#)<sup>7</sup> indicate that the fatality rate for those under age 70 is  
9 0.04%, less than or equal to seasonal influenza.

10 10. Given the data released in the most recent studies, we also now know who  
11 to protect, because this disease - by the evidence - is not equally dangerous across the  
12 population. More than 40 percent of all US deaths occurred in nursing home patients. In  
13 California, 76 percent of deaths were in those over the age of 65<sup>8</sup>; 93 percent were in  
14 people over 50<sup>9</sup>, similar to what was noted in [New York](#)<sup>10</sup> and all over the world.

15  
16  
17 <sup>4</sup> California Coronavirus, COVID-19 Statewide Update.  
<https://update.covid19.ca.gov/>; American Hospital Directory,  
18 [https://www.ahd.com/states/hospital\\_CA.html](https://www.ahd.com/states/hospital_CA.html)

19 <sup>5</sup> Malin Otmani, *COVID-19: First results of the voluntary screening in Iceland*,  
[https://nordiclifescience.org/covid-19-first-results-of-the-voluntary-screening-in-](https://nordiclifescience.org/covid-19-first-results-of-the-voluntary-screening-in-iceland/)  
20 [iceland/](https://nordiclifescience.org/covid-19-first-results-of-the-voluntary-screening-in-iceland/) Nordic Life Science News, (*Europe*) (March 22, 2020).

21 <sup>6</sup> Leigh Hopper, *Early antibody testing suggests COVID-19 infections in L.A.*  
*County greatly exceed documented cases*, USC News,  
22 [https://news.usc.edu/168987/antibody-testing-results-covid-19-infections-los-angeles-](https://news.usc.edu/168987/antibody-testing-results-covid-19-infections-los-angeles-county/)  
23 [county/](https://news.usc.edu/168987/antibody-testing-results-covid-19-infections-los-angeles-county/) (April 20, 2020).

24 <sup>7</sup> John P.A. Ioannidis, *The infection fatality rate of COVID-19 inferred from*  
*seroprevalence data*, *MedRxiv*, *BMJ Yale*,  
25 <https://www.medrxiv.org/content/10.1101/2020.05.13.20101253v2> (July 14, 2020).

26 <sup>8</sup> California Coronavirus, COVID-19 Statewide Update,  
<https://update.covid19.ca.gov/>

27 <sup>9</sup> *Id.*

28 <sup>10</sup> New York State Department of Health, *Fatalities by County*,  
[https://covid19tracker.health.ny.gov/views/NYS-COVID19-Tracker/NYSDOHCOVID-](https://covid19tracker.health.ny.gov/views/NYS-COVID19-Tracker/NYSDOHCOVID-19Tracker-Fatalities?%3Aembed=yes&%3Atoolbar=no&%3Atabs=n)  
[19Tracker-Fatalities?%3Aembed=yes&%3Atoolbar=no&%3Atabs=n](https://covid19tracker.health.ny.gov/views/NYS-COVID19-Tracker/NYSDOHCOVID-19Tracker-Fatalities?%3Aembed=yes&%3Atoolbar=no&%3Atabs=n) (July 8, 2020).

1           11. Of particular relevance to student populations in California, we also know  
2 that younger, healthier people have *virtually zero* risk of [death](#)<sup>11</sup> from this infection. The  
3 school setting is an environment where nearly 100 percent of students are under 18 years  
4 old, the lowest risk group. For instance, in California, 0% percent of deaths (literally,  
5 zero deaths) have occurred in people under 18, and only 6.8% of deaths have occurred  
6 in people under 49 years of age.<sup>12</sup> According to the [CDC](#)<sup>13</sup> on July 1, 2020, of the first  
7 112,226 US deaths, 0.01 percent of deaths occurred in people under 25 years of age; i.e.,  
8 99.9 percent were in people 25 or older, and 81 percent were in people over 65.

9           12. Younger, healthier people likewise have virtually no risk of serious illness  
10 from COVID-19. Less than one percent of New York City's [hospitalizations](#)<sup>14</sup> have been  
11 patients under 18 years of age. The data reproduced in a May [JAMA Pediatrics](#)<sup>15</sup> study  
12 flatly stated that "children are at far greater risk of critical illness from influenza than  
13 from COVID-19." Exceptions exist, as they do with virtually *every other clinically*  
14 *encountered infection*, but that should not outweigh the overwhelming evidence to the  
15 contrary. If the COVID-19 hazard sets the new standard for health safety, the country  
16 will need to close its schools each year from November until April to guard against  
17 influenza.

18  
19  
20  
21 <sup>11</sup> NYC.gov, *Covid-19: Data*, <https://www1.nyc.gov/site/doh/covid/covid-19-data.page#download> (July 8, 2020).

22 <sup>12</sup> California Coronavirus, COVID-19 Statewide Update,  
23 <https://update.covid19.ca.gov/>

24 <sup>13</sup> Centers for Disease Control and Prevention, *Weekly Updates by Select*  
25 *Demographic and Geographic Characteristics*,  
26 [https://www.cdc.gov/nchs/nvss/vsrr/covid\\_weekly/index.htm](https://www.cdc.gov/nchs/nvss/vsrr/covid_weekly/index.htm) (July 22, 2020).

27 <sup>14</sup> NYC.gov, *Covid-19: Data, Cases, Hospitalizations and Deaths*,  
28 <https://www1.nyc.gov/site/doh/covid/covid-19-data.page#download> (July 24, 2020).

<sup>15</sup> Lara S. Shekerdemain, MD, *Characteristics and Outcomes of Children With*  
*Coronavirus Disease 2019 (COVID-19) Infection Admitted to US and Canadian*  
*Pediatric Intensive Care Units*,  
<https://jamanetwork.com/journals/jamapediatrics/fullarticle/2766037> (May 11, 020).

1           13. A recent study by the CDC concluded that children who become infected  
2 are also “far less likely to suffer severe symptoms.”<sup>16</sup> The evidence also confirms that  
3 death rates among school-aged children are *much* lower than among adults.<sup>17</sup> As of July  
4 17, 2020, the US reported that children and adolescents under 18 years old account for  
5 under 7 percent of COVID-19 cases and *less than 0.1 percent* of COVID-19-related  
6 deaths.<sup>18</sup>

7           14. Indeed, COVID-19 appears to be less deadly to children and adolescents  
8 than the seasonal flu. From 2004–2005 to 2018–2019, for example, flu-related deaths in  
9 children reported to CDC during regular flu seasons ranged from 37 to 187 deaths.<sup>19</sup>  
10 During the H1N1 pandemic (April 15, 2009 to October 2, 2010), 358 pediatric deaths  
11 were reported to CDC.<sup>20</sup> So far in this pandemic, only 64 children have died of COVID-  
12 19 related symptoms, fewer than the deaths reported in each of the last five flu seasons.

13           15. Scientific studies from all over the world also suggest that COVID-19  
14 transmission among children in schools is low.<sup>21</sup> Current data reported by the CDC  
15 indicate that the rate of infection among younger school children, and from students to  
16 teachers, is very low, especially if proper precautions are followed.<sup>22</sup> There have also  
17 been few reports of children being the primary source of COVID-19 transmission among  
18 family members. This is consistent with data from both virus and antibody testing,  
19 suggesting that children are not the primary drivers of COVID-19 spread in schools or  
20 in the community.

---

21  
22  
23  
24 <sup>16</sup> Centers for Disease Control and Prevention, *The Importance of Reopening*  
25 *America’s Schools this Fall*, [https://www.cdc.gov/coronavirus/2019-  
ncov/community/schools-childcare/reopening-schools.html](https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/reopening-schools.html) (July 23, 2020).

26 <sup>17</sup> *Id.*

27 <sup>18</sup> *Id.*

28 <sup>19</sup> *Id.*

<sup>20</sup> *Id.*

<sup>21</sup> *Id.*

<sup>22</sup> *Id.*

1 16. The data go even further – in other countries, including [Switzerland](#)<sup>23</sup>,  
2 [Canada](#)<sup>24</sup>, the [Netherlands](#)<sup>25</sup>, [France](#)<sup>26</sup>, [Iceland](#)<sup>27</sup>, the [UK](#)<sup>28</sup>, [Australia](#)<sup>29</sup>, and  
3 [Ireland](#)<sup>30</sup>, researchers have found that children *rarely* transmit the disease to adults if at

4 \_\_\_\_\_  
5 <sup>23</sup> RTS Info, *En Suisse, 104 enfants de moins de 10 ans ont été testés positifs au*  
6 *Covid-19*, [https://www.rts.ch/info/sciences-tech/medecine/11255942-en-suisse-104-](https://www.rts.ch/info/sciences-tech/medecine/11255942-en-suisse-104-enfants-de-moins-de-10-ans-ont-ete-testes-positifs-au-covid-19.html)  
7 [enfants-de-moins-de-10-ans-ont-ete-testes-positifs-au-covid-19.html](https://www.rts.ch/info/sciences-tech/medecine/11255942-en-suisse-104-enfants-de-moins-de-10-ans-ont-ete-testes-positifs-au-covid-19.html) (Switzerland)  
8 (April 17, 2020).

9 <sup>24</sup> Sarah Silverberg, MD, *Caring for Children with COVID-19*, British Columbia  
10 Ministry of Health, (Canada) [http://www.bccdc.ca/Health-Professionals-](http://www.bccdc.ca/Health-Professionals-Site/Documents/Caring-for-children.pdf)  
11 [Site/Documents/Caring-for-children.pdf](http://www.bccdc.ca/Health-Professionals-Site/Documents/Caring-for-children.pdf) (April 3, 2020).

12 <sup>25</sup> National Institute for Public Health and the Environment, Ministry of Health,  
13 Welfare and Sport, [https://www.rivm.nl/en/novel-coronavirus-covid-19/children-and-](https://www.rivm.nl/en/novel-coronavirus-covid-19/children-and-covid-19)  
14 [covid-19](https://www.rivm.nl/en/novel-coronavirus-covid-19/children-and-covid-19) (July 20, 2020) (“Data from the Netherlands also confirms the current  
15 understanding: that children play a minor role in the spread of the novel coronavirus.  
16 The virus is mainly spread between adults and from adult family members to  
17 children.”).

18 <sup>26</sup> Salome Vincendon, “*Low Carriers, Low Transmitters*”: *Study Confirms the*  
19 *Minimal Role of Children in the COVID-19 Epidemic*, BFM TV,  
20 [https://www.bfmtv.com/sante/peu-porteurs-peu-transmetteurs-une-etude-confirme-le-](https://www.bfmtv.com/sante/peu-porteurs-peu-transmetteurs-une-etude-confirme-le-role-minime-des-enfants-dans-l-epidemie-de-covid-19_AV-202005120233.html)  
21 [role-minime-des-enfants-dans-l-epidemie-de-covid-19\\_AV-202005120233.html](https://www.bfmtv.com/sante/peu-porteurs-peu-transmetteurs-une-etude-confirme-le-role-minime-des-enfants-dans-l-epidemie-de-covid-19_AV-202005120233.html) (May  
22 12, 2020).

23 <sup>27</sup> Roger Highfield, *Coronavirus: Hunting Down Covid-19*, Science Museum  
24 Group, <https://www.sciencemuseumgroup.org.uk/blog/hunting-down-covid-19/>  
25 (Iceland) (April 27, 2020) (“What is interesting is that even if children do get infected,  
26 they are less likely to transmit the disease to others than adults. We have not found a  
27 single instance of a child infecting parents.”)

28 <sup>28</sup> Hayley Dixon, *No reported case of a child passing coronavirus to an adult exists,*  
29 *evidence review shows*, [https://www.telegraph.co.uk/news/2020/04/29/no-case-child-](https://www.telegraph.co.uk/news/2020/04/29/no-case-child-passing-coronavirus-adult-exists-evidence-review/)  
30 [passing-coronavirus-adult-exists-evidence-review/](https://www.telegraph.co.uk/news/2020/04/29/no-case-child-passing-coronavirus-adult-exists-evidence-review/) (April 29, 2020).

<sup>29</sup> The Australian Health Protection Principal Committee (AHPCC), *Updated*  
31 *Advice Regarding Schools*, [https://www.health.gov.au/news/australian-health-](https://www.health.gov.au/news/australian-health-protection-principal-committee-ahppc-coronavirus-covid-19-statements-on-24-april-2020#updated-advice-regarding-schools)  
32 [protection-principal-committee-ahppc-coronavirus-covid-19-statements-on-24-april-](https://www.health.gov.au/news/australian-health-protection-principal-committee-ahppc-coronavirus-covid-19-statements-on-24-april-2020#updated-advice-regarding-schools)  
33 [2020#updated-advice-regarding-schools](https://www.health.gov.au/news/australian-health-protection-principal-committee-ahppc-coronavirus-covid-19-statements-on-24-april-2020#updated-advice-regarding-schools) (April 16, 2020) (“AHPCC continues to note  
34 that there is very limited evidence of transmission between children in the school  
35 environment; population screening overseas has shown very low incidence of positive  
36 cases in school-aged children.”).

<sup>30</sup> Laura Heavey, Geraldine Casey, Ciara Kelly, David Kelly and Geraldine  
37 McDarby, *No evidence of secondary transmission of COVID-19 from children*  
38 *attending school in Ireland, 2020*, *Eursurveillance*



1 all, even to their parents. This disease is typically spread by individuals with high “viral  
2 load”, and children, asymptomatic people, as well as those pre-symptomatic people who  
3 will later develop symptoms, all have lower viral loads.

4 17. With respect to teachers, parents, and relatives, it is clear that as a society, it  
5 will be necessary to make visible the clear, specific guidelines and warnings about high-  
6 risk groups. However, teaching is generally a relatively young profession. Half of K-12  
7 [teachers](#)<sup>31</sup> are 41 or younger; 81% are under 55.

8 18. Many states have noted a significant increase in cases of the coronavirus  
9 infection. This specific point has created unnecessary fear and its significance has been  
10 widely misinterpreted. Infections are not dangerous to children, in fact they are far less  
11 dangerous than seasonal influenza infections. Infections are only significantly dangerous  
12 to high-risk adults, and the majority of teachers are not in the high-risk group.

13 19. Moreover, as the CDC’s recent report indicates, extended school closure is  
14 harmful to children.<sup>32</sup> It is well known that “long breaks from in-person education,”  
15 such as occur over the summer, “are harmful to student learning.”<sup>33</sup> The prospect of  
16 losing several months of schooling is likely to make the learning loss even more severe.<sup>34</sup>  
17 The CDC notes that “disparities in education outcomes caused by school closures are a  
18 particular concern for low-income and minority students and students with disabilities,”  
19 as many families do not have the capacity to facilitate distance learning.<sup>35</sup> In particular,

20 \_\_\_\_\_  
21 <https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.21.2000903>,  
22 (May 28, 2020) (“[This study] adds to current evidence that children do not appear to be  
23 drivers of transmission, and we argue that reopening schools should be considered safe  
24 accompanied by certain measures.”)

24 <sup>31</sup> National Center for Education Statistics, *Schools and Staffing Survey*,  
25 [https://nces.ed.gov/surveys/sass/tables/sass1112\\_2013314\\_t1s\\_002.asp](https://nces.ed.gov/surveys/sass/tables/sass1112_2013314_t1s_002.asp) (last visited  
26 July 24, 2020).

26 <sup>32</sup> Centers for Disease Control and Prevention, *The Importance of Reopening*  
27 *America’s Schools this Fall*, [https://www.cdc.gov/coronavirus/2019-  
28 ncov/community/schools-childcare/reopening-schools.html](https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/reopening-schools.html) (July 23, 2020).

28 <sup>33</sup> *Id.*

<sup>34</sup> *Id.*

<sup>35</sup> *Id.*



1 students who are deaf, hard of hearing, have low vision, are blind, or have other learning  
2 disorders (e.g., attention deficit hyperactivity disorder (ADHD) and other physical and  
3 mental disabilities have had significant difficulties with remote learning.<sup>36</sup>

4 20. Extended school closures are also harmful to children’s development of  
5 social and emotional skills.<sup>37</sup> Routine in-person contacts provide opportunities to  
6 facilitate social-emotional development that are difficult, if not impossible, to replicate  
7 through distance learning.<sup>38</sup> Being in a school setting with peers and teachers is also  
8 associated with lower levels of depression, thoughts about suicide, social anxiety, and  
9 sexual activity, as well as higher levels of self-esteem and more adaptive use of free  
10 time.<sup>39</sup>

11 21. Children also obtain access to vital services at school that they do not receive  
12 elsewhere. For example, in-person schooling provides children with access to mental  
13 health services, nutrition, physical activity, and even personal safety.<sup>40</sup> The CDC thus  
14 concluded that school closure disrupts the delivery of in-person instruction and critical  
15 services to children and families, which has negative individual and societal  
16 ramifications.<sup>41</sup>

17 22. The Governor’s Order appears to be based on the fear that the rising  
18 infection rates in California will result in a “second wave” of infections. This fear is  
19 misplaced for several reasons.

20 23. **First**, we know and fully anticipate that relaxing total isolation will lead to  
21 more infections, and we have had numerous protest marches and riots with thousands of  
22 individuals not obeying prescribed social distancing measures. The timing of the rise in  
23 cases does not temporally correlate to the gradual, partial reopening policies of states  
24 that had begun reopening. The rise in cases does correlate to other factors, however,

---

25 <sup>36</sup> *Id.*

26 <sup>37</sup> *Id.*

27 <sup>38</sup> *Id.*

28 <sup>39</sup> *Id.*

<sup>40</sup> *Id.*

<sup>41</sup> *Id.*

1 especially the massive public protests, where most of the protesters were young, as  
2 depicted in news reports. And in southern states bordering Mexico, the rise in cases,  
3 hospitalizations, and deaths correlates to the timing of cases in Mexico's northern states,  
4 as many of the sick and infected seek care here, as reported in the [New York Times](#) in  
5 June.<sup>42</sup>

6       24. **Second**, we know that we will detect more cases now that we have instituted  
7 more widespread testing for the infection, given that the definition of a "case" is a  
8 positive test, regardless of specific symptoms and even if asymptomatic.

9       25. **Third**, it is simply irrational and unnecessary to seek to eliminate COVID-  
10 19 cases as a policy goal, because COVID-19 is a widespread, contagious disease that is  
11 already in place in tens of millions of people and from which the vast majority fully  
12 recover.

13       26. **Fourth**, in states exhibiting a rise in cases, the overwhelming majority of  
14 infections are in younger, healthier people, the very population that has no serious  
15 problem with the infection. While the cases have increased steeply, the fact that deaths  
16 have not increased dramatically is a clear demonstration that the number of cases is not  
17 a significant problem in and of itself, because many of the infected people are not high-  
18 risk. Indeed, the disastrous projections of massive deaths in the states with more relaxed  
19 reopening policies have proven to be grossly incorrect.

20       27. **Fifth**, the increase in cases among the lower risk groups is actually a  
21 positive, because this is the very population that will serve as helpful in developing herd  
22 immunity. We know from decades of medical science that infection itself allows people  
23 to generate an immune response – antibodies – so that the infection is controlled throughout  
24 the population by "[herd immunity](#)<sup>43</sup>". Indeed, that is the main purpose of widespread

---

25  
26 <sup>42</sup> The New York Times, *Coronavirus Jumps the Border, Overwhelming Hospitals*  
27 *in California* (updated June 29, 2020),  
28 <https://www.nytimes.com/2020/06/07/us/coronavirus-border-mexico-california-el-centro.html>

<sup>43</sup> C.J.E. Metcalf, M. Ferrari, A.L. Graham, B.T. Grenfell, *Understanding Herd Immunity*, Science Direct,

1 immunization in other viral diseases – to assist with population immunity. By transmitting  
2 the virus to others in the low-risk group who then generate antibodies or other forms of  
3 immunity, including [t-cell](#)<sup>44</sup> responses, they block the network of pathways toward the  
4 most vulnerable people, ultimately ending the threat. That is a likely explanation for why  
5 large protests in New York City have not resulted in subsequent cases, because the  
6 earlier overwhelming number of cases there likely resulted in a significant degree of  
7 population immunity, *i.e.*, [26 percent](#) citywide tested by June 26, 2020 showed  
8 antibodies to the virus.

9 28. While we do not know with certainty that antibodies from COVID-19 stop  
10 infection, it is expected, based on decades of virology science, including other  
11 [coronavirus](#)<sup>45</sup> respiratory viruses, where immunity post-infection is thought to last for a  
12 year or more. Indeed, there have been no confirmed cases of reinfection. That's why  
13 scientists are hopeful about using COVID-19 antibodies to treat the sickest patients; that's  
14 the basis for the drive to generate a vaccine.

15 29. In summary, and in agreement with the June 17, 2020 [recommendations](#) of  
16 Toronto's Hospital for Sick Kids,<sup>46</sup> one of the world's leading pediatric hospitals, it is  
17 clear that with appropriate social distancing, adequate hygiene and available sanitization,  
18 schools in California can open safely without exposing children to any significant risks  
19 from COVID-19, and without significantly increasing the risk of infection to teachers  
20 and parents. Further, it is extremely harmful to children to keep schools closed.

21 <https://www.sciencedirect.com/science/article/abs/pii/S1471490615002495?via%3Dihub>  
22 [b](#) (December 2015).

23 <sup>44</sup> Takuya Sekine, Andre Perez-Potti, et al., *Robust T cell immunity in convalescent*  
24 *individuals with asymptomatic or mild COVID-19*, *BioRxiv*,  
<https://www.biorxiv.org/content/10.1101/2020.06.29.174888v1> (June 29, 2020).


25 <sup>45</sup> David A. J. Tyrrell and Steven H. Myint NCBI Resources, Baron S, editor.  
26 *Medical Microbiology*. 4th edition. Galveston (TX): University of Texas Medical  
27 Branch at Galveston; *Medical Microbiology - Coronaviruses*,  
<https://www.ncbi.nlm.nih.gov/books/NBK7782/> Chapter 60, 1996)

28 <sup>46</sup> COVID-19: Recommendations for School Reopening,  
<http://www.sickkids.ca/PDFs/About-SickKids/81407-COVID19-Recommendations-for-School-Reopening-SickKids.pdf>

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

DATED this 25th day of July 2020

DocuSigned by:  
  
\_\_\_\_\_  
Scott W. Atlas AF465151A48467...

**EXHIBIT 4**

**SCOTT WILLIAM ATLAS, M.D.**

June 1, 2020



**Faculty Position:** Robert Wesson Senior Fellow  
Hoover Institution  
Stanford University

**Office Address:** Hoover Institution  
HHMB 350  
Stanford University  
434 Galvez Mall  
Stanford, CA 94305-6010  
(650) 723-0340  
[swatlas@stanford.edu](mailto:swatlas@stanford.edu)

**Date of Birth:** July 5, 1955

**Place of Birth:** Chicago, Illinois, U.S.A.

**Education:** 1981 M.D. University of Chicago  
Pritzker School of Medicine  
Chicago, Illinois  
1977 B.S. University of Illinois  
Champaign-Urbana, Illinois

**Postdoctoral Training:**

1985-87 Fellow in Neuroradiology  
Hospital of the University of Pennsylvania  
Philadelphia, Pennsylvania  
1984-85 Chief Resident in Radiology  
Northwestern University Medical Center  
Chicago, Illinois  
1982-85 Resident in Diagnostic Radiology  
Northwestern University Medical Center  
Chicago, Illinois  
1981-82 Intern in Medicine - Categorical  
University of California, Irvine - Long Beach Medical Program  
Long Beach, California



**Certification:** National Board of Medical Examiners (#249308) 1978-1981  
American Board of Radiology 1985  
Certificate of Added Qualification - Neuroradiology 1995; 2005

**Licensure:** California (1987) #G 59953  
New York (1996) #202179 (*inactive*)  
Pennsylvania (1985) #MD 033549 E (*inactive*)  
Oregon (1995) #19287 (*inactive*)

**Honors, Awards, and Memberships in Honorary Societies:**

National Merit Finalist  
Phi Eta Sigma  
Alpha Epsilon Delta  
Phi Kappa Phi  
William J. Cook Scholar  
Edmund J. James Scholar  
Honorary Member, Chicago Radiological Society  
Honorary Member, Pacific Northwest Radiological Society  
Honorary Member, New York Medical College Radiological Society  
Honorary Member, Mexican Society of Radiology and Imaging  
*The Best Doctors in America: 1994 (1<sup>st</sup> edition, Woodward/White Inc.) annually through present*  
*The Best Doctors in America - Northeast Region: 1996-1997, Woodward/White Inc.*  
*"The Best Doctors in New York", New York magazine, May 20, 1996*  
*How to Find the Best Doctors in The New York Metro Area - 1997, Castle & Connolly*  
*How to Find the Best Doctors in The New York Metro Area - 1998, Castle & Connolly*  
*"Silicon Valley's Best Doctors", San Jose magazine, March/April 1999*  
*"Silicon Valley's Best Doctors", San Jose magazine, March/April 2000*  
*"Silicon Valley's Best Doctors", San Jose magazine, July/August 2002*  
*"Top Docs—400 Local Physicians You'd Trust Your Life With", San Jose Magazine, March 2001*  
*How to Find the Best Doctors: San Francisco Bay Area - 2000, Castle & Connolly*  
*"Top 500 Doctors in the Bay Area", San Francisco magazine, January 2001*  
*"Top 500 Doctors in the Bay Area", San Francisco magazine, January 2005*  
*America's Top Doctors, Castle & Connolly, 1997 (1<sup>st</sup> edition) annually through present*  
*America's Top Radiologists, Consumers Research Council of America 2006*  
*America's Top Doctors for Cancer, 2006; 2007; 2008; 2009*  
*Member, Nominating Committee, Nobel Prize in Medicine and Physiology; 2004 - 2011*  
*Fulbright Scholar (Senior Specialist Award) 2005 - 2010*  
*University of Illinois Comeback Award Distinguished Alumni, 2008*  
*Honorary Member, Sociedade de Radiologia de Pernambuco, Recife, Brazil, 2009*  
*67<sup>th</sup> Annual Holmes Lecturer, New England Roentgen Ray Society, April 8, 2011*  
*University of Illinois Alumni Achievement Award Distinguished Alumni, 2011*  
*US News and World Report "Top 1% in the Field" , 2011*  
*Honorary Member, Sociedade Brasileira de Neuroradiologia, Fortaleza, Brazil, 2012*  
*Honorary Member, Sociedade Cearense de Radiologia, Fortaleza, Brazil, 2013*  
*Honorary Permanent Visiting Professor, Department of Neuroradiology,*  
*University of Zurich, Zurich, Switzerland, 2013-2016*  
*Advisory Board, Clinical Neuroscience Institute, University of Zurich, Switzerland, 2018-present*

**Academic Faculty Appointments:**

1987-1988 Assistant Professor of Radiology, Neuroradiology Section  
University of California, San Francisco  
San Francisco, California

1988-1990 Assistant Professor of Radiology, Neuroradiology Section  
Assistant Professor of Neurosurgery (secondary appointment)  
Hospital of the University of Pennsylvania  
Philadelphia, Pennsylvania

1990-1995 Associate Professor of Radiology, Neuroradiology Section  
Associate Professor of Neurosurgery (secondary appointment)  
Hospital of the University of Pennsylvania  
Philadelphia, Pennsylvania

1995-1996 Professor of Radiology  
Oregon Health Sciences University School of Medicine  
Chief of Divisions of Neuroradiology and Magnetic Resonance  
Oregon Health Sciences University Medical Center  
Portland, Oregon

1996-1998 Professor of Radiology  
The Mount Sinai School of Medicine  
Director of Neuroradiology  
The Mount Sinai Medical Center  
New York, New York

1998-2012 Professor of Radiology  
Stanford University Medical Center  
Chief of Neuroradiology  
Stanford University Medical Center  
Stanford, California

2002-2012 Senior Fellow by courtesy  
Hoover Institution, Stanford University  
Stanford, California

2007-2012 Senior Fellow by courtesy  
Freeman Spogli Institute for International Studies  
Stanford University  
Stanford, California

2010-present Member, Working Group on Health Care Policy  
Hoover Institution, Stanford University  
Stanford, California

2012-present David and Joan Traitel Senior Fellow (2012-2020)  
Robert Wesson Senior Fellow (2020-present)  
Hoover Institution, Stanford University  
Stanford, California

2013-2016 Visiting Professor in Neuroradiology  
Institute of Neuroradiology, University Hospital Zurich  
Zurich, Switzerland

**Administrative Appointments:**

1987-88 Staff Radiologist  
University of California Medical Center  
San Francisco, California, USA

1987-88 Medical Director  
San Francisco Magnetic Resonance Center  
UCSF Out-Patient MR Center  
San Francisco, California, USA

1988-1995 Staff Radiologist  
University of Pennsylvania Medical Center  
Philadelphia, Pennsylvania, USA

1988-1995 Staff Radiologist  
Children's Hospital of Philadelphia  
Philadelphia, Pennsylvania, USA

1988-1995 Staff Radiologist  
Wills Eye Hospital  
Philadelphia, Pennsylvania, USA

1992-1994 Executive Committee, Radiology Associates  
Hospital of the University of Pennsylvania  
Philadelphia, Pennsylvania, USA

1995-1996 Staff Radiologist  
Oregon Health Sciences University Medical Center  
Portland, Oregon, USA

1995-1996 Chief, Divisions of Neuroradiology and Magnetic Resonance  
Oregon Health Sciences University Medical Center  
Portland, Oregon, USA

1995-1996 Director, Neuroradiology Fellowship Program  
Oregon Health Sciences University Medical Center  
Portland, Oregon, USA

1995-1996 Honorary Director, University Radiology Practice Corporation  
Oregon Health Sciences University Medical Center  
Portland, Oregon, USA

1995-1996 Member, Steering Committee, Oregon Brain Institute  
Oregon Health Sciences University Medical Center  
Portland, Oregon, USA

1995-1996 Member, Retirement Benefits Committee  
Department of Radiology  
Oregon Health Sciences University Medical Center  
Portland, Oregon, USA

1995-1996 Member, Resident Education Committee  
Department of Radiology  
Oregon Health Sciences University Medical Center  
Portland, Oregon, USA

1996-1998 Staff Radiologist  
The Mount Sinai Medical Center  
New York, New York, USA

1996-1998 Director, Division of Neuroradiology  
The Mount Sinai Medical Center  
New York, New York, USA

1996-1998 Director, Neuroradiology Fellowship Program  
The Mount Sinai Medical Center  
New York, New York, USA

1996-1998 Member, Radiology Executive Committee  
The Mount Sinai Medical Center  
New York, New York, USA

1996-1998 Chair, Radiology Research Committee  
The Mount Sinai Medical Center  
New York, New York, USA

1998-2012 Chief, Neuroradiology Section  
Stanford University Medical Center  
Stanford, California, USA

1998-2012 Staff Radiologist  
Stanford University Medical Center  
Stanford, California, USA

1998-2012 Staff Radiologist  
Lucille Packard Childrens Hospital  
Stanford, California, USA

1998-2012 Staff Radiologist  
Palo Alto VA Medical Center  
Palo Alto, California, USA

1998- 2012 Director, Neuroradiology Fellowship Program  
Stanford University Medical Center  
Stanford, California, USA

1998-2009 Member, MR Research Committee  
Stanford University Medical Center  
Stanford, California, USA

1998-2003 Member, PACS Committee  
Stanford University Medical Center  
Stanford, California, USA

1998-2012 Member, Radiology Executive (Section Chief) Committee  
Stanford University Medical Center  
Stanford, California, USA

1998-2012 Member, Stanford Brain Institute  
Stanford University Medical Center  
Stanford, California, USA

1998-1999 Head, Neurointerventional Radiology Faculty Search Committee  
Stanford University Medical Center  
Stanford, California, USA

1999-2000 Member, Stanford Brain Research Institute  
Stanford University Medical Center  
Stanford, California, USA

1999-2000 Member, Body Interventional Radiology Search Committee  
Stanford University Medical Center  
Stanford, California, USA

1998-2000 Member, Pediatric Radiology Chief Search Committee  
Stanford University Medical Center  
Stanford, California, USA

1999-2001 Chair, Pediatric Neuroradiology Faculty Search Committee  
Stanford University Medical Center  
Stanford, California, USA

1998-2000 Member, Palo Alto VA Radiology Chief Search Committee  
Palo Alto VA Medical Center  
Stanford, California, USA

2000-2004 Chair, General Neuroradiology Faculty Search Committee  
Stanford University Medical Center  
Stanford, California, USA

2000-2001 Member, Magnetic Resonance Neuroscientist Search Committee  
Stanford University Medical Center  
Stanford, California, USA

2000-2003 Member, Radiology Faculty Evaluation Committee  
Stanford University Medical Center  
Stanford, California, USA

2001-2002 Member, MR Process "Six Sigma" Management Committee  
Stanford University Medical Center  
Stanford, California, USA

2002-2007 Member, Radiology Education Committee  
Stanford University Medical Center  
Stanford, California, USA

2006-2008 Member, Pediatric Neuroradiologist Search Committee  
Lucile Packard Children's Hospital  
Stanford University Medical Center  
Stanford, California, USA

2007-2008 Chair, Neuroradiology Faculty Search Committee  
Stanford University Medical Center  
Stanford, California, USA

2007-2008 Member, 7T High Field Magnetic Resonance Scientist Search Committee  
Stanford University Medical Center  
Stanford, California, USA

2006-2008 Member, Stanford Center in China *Ad Hoc* Advisory Committee  
Representative, School of Medicine  
Stanford University  
Stanford, California, USA

2011-2012 Member, BioX  
Stanford University School of Medicine  
Stanford, California, USA

2019-2020 Member, Director of Hoover Institution Faculty Search Committee  
Stanford University  
Stanford, California, USA

**Professional and Scientific Societies, Current and Past:**

Radiological Society of North America  
American Society of Neuroradiology (Senior Member)  
American Heart Association Stroke Council  
American Heart Association Cardiovascular Radiology Council  
International Society of Magnetic Resonance in Medicine

**Scientific and Medical Advisory Boards, and Corporate Boards, Current and Past:**

MR Contrast Agent Advisory Board, Bristol-Myers Squibb Diagnostics  
MR Advisory Board, Bracco International  
MR Advisory Board, Sanofi-Winthrop  
MR Contrast Agent Advisory Board, Nycomed  
MR Advisory Board, General Electric Medical Systems  
High Speed CT Advisory Board, General Electric Medical Systems  
Frontiers in MR Advisory Board, Nycomed  
Tangiers International, Advisory Board  
Neuro Advisory Board, GE Healthcare  
Alzeca Biosciences, Inc. Board of Directors (Chairman)  
TechTools, Sao Paulo, Brazil (Principal Advisor)  
Clinical Neuroscience Institute, University of Zurich



**Training Record:**

<b>Name of Trainee</b>	<b>Position as Trainee</b>	<b>Years of Training</b>	<b>Current (or Known) Position</b>
Alexander Mark, MD	neuroradiology fellow	1987-1988	Director of MRI Washington Hospital Ctr. Associate Clinical Professor George Washington Univ. Washington, D.C.
Evan Fram, MD	neuroradiology fellow	1987-1988	Neuroradiologist Barrow Neurologic Institute Phoenix, AZ
Christine Emery, MD	neuroradiology fellow	1987-1988	Neuroradiologist Pennsylvania Hospital Assistant Clinical Professor Thomas Jefferson Univ. Philadelphia, PA
Christopher Dowd, MD	neuroradiology fellow	1987-1988	Assistant Clinical Professor UCSF Medical Center San Francisco, CA
N. Raghavan, MD	neuroradiology fellow	1987-1988	Neuroradiologist Sacramento, CA
Donald Jackson, MD	neuroradiology fellow	1987-1988	Neuroradiologist Eureka, CA
Richard Smith, MD	neuroradiology fellow	1986-1988	Associate Professor Indiana Univ. Medical Ctr. Indianapolis, IN
Bruce Braffman, MD	neuroradiology fellow	1986-1988	Neuroradiologist Memorial Hospital Hollywood, FL
Edward Burry, MD	neuroradiology fellow	1986-1988	Neuroradiologist Akron, OH
Wendell Gibby, MD	neuroradiology fellow	1987-1988	Neuroradiologist Utah Valley Hospital Provo, UT
Edward Fobben MD	neuroradiology fellow	1987-1989	Neuroradiologist St. Barnabus Hospital Livingstone, NJ
David Teitelbaum, M.D.	neuroradiology fellow	1987-1989	Neuroradiologist Brockton, MA
Debra Gusnard, MD	neuroradiology fellow	1987-1989	Neuroradiologist St. Louis, MO
William Armington, MD	neuroradiology fellow	1987-1989	Neuroradiologist New Orleans, LA
David Yousem, MD	neuroradiology fellow	1988-1990	Professor of Radiology Johns Hopkins Hospital Baltimore, MD
Stein Rafto, MD, PhD	neuroradiology fellow	1988-1990	Neuroradiologist University of Hawaii Honolulu, HI
Peter Janick, MD	neuroradiology fellow	1988-1990	Neuroradiologist East Lansing, MI
Robert Hurst, MD	neuroradiology fellow	1989-1991	Associate Professor Univ. of Pennsylvania Philadelphia, PA

Elliott Lerner, MD	neuroradiology fellow	1989-1991	Neuroradiologist Radiology Ass. of Ridgewood Ridgewood, NJ
Stuart Bobman, MD	neuroradiology fellow	1989-1991	Neuroradiologist Radiology Regional Center Fort Myers, FL
Barry Menick, MD	neuroradiology fellow	1989-1991	Neuroradiologist South Texas Radiology San Antonio, TX
Walter Milton, MD	neuroradiology fellow	1989-1991	Neuroradiologist Radiology Associates Oklahoma City, OK
Leslie Miller, MD	neuroradiology fellow	1990-1991	Neuroradiologist Winthrop Univ. Hospital Mineola, NY
Sharon Seltzer, MD	neuroradiology fellow	1991-1992	Neuroradiologist VA Hospital Washington D. C.
Frank Lexa, MD	neuroradiology fellow	1990-1992	Assistant Professor Univ. of Pennsylvania Philadelphia, PA
Patricia Cross, MD	medical student	1990	Radiology resident Univ. of Massachusetts
George Holland, MD	medical student	1989	Assistant Professor Univ. of Pennsylvania
Bruce Shlackman, MD	neuroradiology fellow	1991-1993	Neuroradiologist Fort Lauderdale, FL
John Hiehle, MD	neuroradiology fellow	1991-1993	Neuroradiologist Crozier-Chester, PA
Jeffrey Jarvik, MD	neuroradiology fellow	1991-1993	Assistant Professor Univ. of Washington Seattle, WA
Robert Mittl, MD	neuroradiology fellow	1991-1993	Neuroradiologist Charlotte, NC
Jeffrey Boorstein, MD	neuroradiology fellow	1991-1993	Neuroradiologist Akron, OH
Jeffrey Petrella, MD	neuroradiology fellow	1992-1994	Assistant Professor Duke University Medical Ctr Durham, NC
Robert Noone, MD	medical student	1992	Resident in surgery Johns Hopkins Hospital Baltimore, MD
Howard Siegeman, MD	neuroradiology fellow	1992-1994	Neuroradiologist Ridgewood, NJ
Linda Bagley, MD	neuroradiology fellow	1993-1994	Assistant Professor Univ. of Pennsylvania Philadelphia, PA
Richard Lichtenstein, MD	neuroradiology fellow	1992-1993	Neuroradiologist Tampa, FL
Magie Broderick, MD	medical student	1993	Resident in radiology Yale Univ. Med. Center New Haven, CT
Sylvia Coll, M.D.	research fellow	1993	Neuroradiologist Barcelona, Spain
Lisa Sheppard, MD	neuroradiology fellow	1993-1994	Neuroradiologist NJ

Van Wadlington, MD	neuroradiology fellow	1992-1993	Neuroradiologist George Washington Univ. Washington, D.C.
Willis Chung, MD	neuroradiology fellow	1992-1994	Neuroradiologist CO
Elizabeth Greenstein, MD	medical student	1993-1994	medical student Univ. of Pennsylvania
Robert Howard, MD	neuroradiology fellow	1993-1995	Neuroradiologist FL
Joseph Maldjian, MD	neuroradiology fellow	1993-1995	Assistant Professor Univ. of Pennsylvania Philadelphia, PA
Laurie Loevner, MD	neuroradiology fellow	1993-1995	Associate Professor Univ. of Pennsylvania Philadelphia, PA
Lazaro Amaral, M.D.	research fellow	1995-1996	Neuroradiologist Sao Paulo, Brazil
Mark Burton, MD	neuroradiology fellow	1995-1996	Neuroradiologist Lake Tahoe, NV
Kenneth Curtin, MD	neuroradiology fellow	1995-1996	Neuroradiologist Lansing, MI
Michael Singer, MD	neuroradiology fellow	1996-1998	Neuroradiologist New York, NY
June Chong, MD	neuroradiology fellow	1996-1998	Neuroradiologist Singapore
Barbara Eisenkraft, MD	neuroradiology fellow	1997-1998	Neuroradiologist New York, NY
Annette Nusbaum, MD	neuroradiology fellow	1997-1998	Assistant Professor Cornell U. Medical Ctr. New York, NY
Richard Bellon, MD	neuroradiology fellow	1998-1999	Neurointerventional fellow Mass General Hospital Boston, MA
Jonathan Bard, MD	neuroradiology fellow	1998-1999	Neuroradiologist Dallas, TX
Rick Kaplan, MD	neuroradiology fellow	1998-1999	Staff Neuroradiologist Stanford Univ. Medical Center Stanford, CA
Kareen Garjian, MD	neuroradiology fellow	1998-1999	Neuroradiologist Los Angeles, CA
Sophia Symko, MD	neuroradiology fellow	1999-2000	Neuroradiologist Denver, CO
Rajul Pandit, MD	neuroradiology fellow	1999-2000	Neuroradiology attending Santa Clara Valley Med Ctr San Jose, CA
Glenn Tsukada, MD	neuroradiology fellow	1999-2000	Neuroradiologist San Diego, CA
Raymond Weir, MD	neuroradiology fellow	1999-2000	Neuroradiologist Univ. Texas. Medical Center Houston, TX
Shaun Butela, MD	neuroradiology fellow	2000-2002	Neuroradiologist Good Samaritan Hospital Los Angeles, CA
Kevin Woolley, MD	neuroradiology fellow	2000-2001	Neuroradiologist Denver, CO

Gizela Laskowska, MD	neuroradiology fellow	2000-2001	Neuroradiologist San Francisco, CA
Ross Goldstein, MD	neuroradiology fellow	2001-2003	Neuroradiologist Denver, CO
Lynn Huang, MD	neuroradiology fellow	2001-2003	Neuroradiologist Arlington, VA
Yervant Arzoumanian, MD	neuroradiology fellow	2001-2002	Neuroradiologist Saudi Arabia
Dan Stucker, MD	neuroradiology fellow	2002-2003	Neuroradiologist Los Altos, CA
Robert Gardner, MD	neuroradiology fellow	2002-2003	Neuroradiologist Monterey, CA
Imtiaz Qureshi, MD	neuroradiology fellow	2002-2003	Neuroradiologist Hartford, CT
Ravinder Sohal, MD	neuroradiology fellow	2002-2003	Neuroradiologist Palo Alto, CA
Mahesh Jayaraman, MD	neuroradiology fellow	2003-2004	Assistant Professor Brown Univ. Medical Center Providence, RI
Bryan Winn, MD	neuroradiology fellow	2003-2004	Neuroradiologist Portland, OR
Ron Homer, MD	neuroradiology fellow	2003-2004	Neuroradiologist Los Angeles, CA
Lauren Tran, MD	neuroradiology fellow	2003-2004	Neuroradiologist Monterey, CA
Ray Levartnuk, MD	neuroradiology fellow	2003-2004	Neuroradiology research Stanford, CA
Steven Sohn, MD	neuroradiology fellow	2003-2004	MSK radiology fellow Los Angeles, CA
Kirk Chottanapund, MD	neuroradiology fellow	2004-2005	Neuroradiologist Berkeley, CA
Doris Yip, MD	neuroradiology fellow	2004-2005	Neuroradiologist Chicago, IL
Roy Vaid, MD	neuroradiology fellow	2004-2005	Neuroradiologist University of Oxford Oxford, England
Stanley Lu, MD	neuroradiology fellow	2004-2005	Neuroradiologist New Jersey
Vikas Vij, MD	neuroradiology fellow	2004-2005	Neuroradiologist Seattle, WA
Adam Gittelman, MD	neuroradiology fellow	2004-2005	Neuroradiologist Tampa, FL
Talia Vertinsky, MD	neuroradiology fellow	2005-2007	Assistant Professor University of British Columbia Neuroradiologist Vancouver General Hospital Vancouver, BC Canada
Michael Krasnakutsky, MD	neuroradiology fellow	2005-2007	Neuroradiologist US Army Teaching Hospital Spokane, Washington
Conway Lien, MD	neuroradiology fellow	2005-2007	Neuroradiologist San Jose, California
Shawn Corey, MD, PhD	neuroradiology fellow	2006-2008	Neuroradiologist Phoenix, AZ

Kristen Yeom, MD	neuroradiology fellow	2006-2008	Assistant Professor Stanford Univ. Sch. Of Med. Pediatric Neuroradiologist Lucile Packard Child. Hospital Stanford, CA
Guemjoo Hwang, MD	neuroradiology fellow	2007-2008	Assistant Professor UC Davis Medical Center Davis, CA
Tuan Nguyen, MD	neuroradiology fellow	2007-2008	Neuroradiologist San Jose, California
Monique Mogensen, MD	neuroradiology fellow	2007-2009	Assistant Professor USC Medical Center Los Angeles, CA
Peter Takeyama, MD	neuroradiology fellow	2007-2009	Private practice radiology Tokyo, Japan
Michael Zeineh, MD, PhD	neuroradiology fellow	2008-2010	Assistant Professor Stanford Univ. Medical Center Stanford, CA
Seena Dakarganian, MD	neuroradiology fellow	2008-2010	Assistant Professor Emory Univ. Medical Center Atlanta, GA
Cam Tran, MD	neuroradiology fellow	2008-2010	Neuroradiologist San Jose, California
Bo Yoon Ha, MD	neuroradiology fellow	2008-2009	Neuroradiologist San Jose, California
Hedi Eslamy, MD	neuroradiology fellow	2009-2010	Staff Radiologist Lucile Packard Childrens Hosp Stanford University Med. Ctr.
Jalal Andre, MD	neuroradiology fellow	2009-2011	Assistant Professor Univ. of Washington Seattle, WA
Thu Le, MD	neuroradiology fellow	2009-2011	Neuroradiologist Sacramento, California
Daniel Gianella, MD	neuroradiology fellow	2009-2011	Neuroradiologist San Jose, California
Caroline Yuh, MD	neuroradiology fellow	2010-2012	Neuroradiologist San Jose, California
Ryan McTaggart, MD	neuroradiology fellow	2010-2011	Neurointerventional Fellow Stanford Univ. Medical Center Stanford, CA
Michael Pulling, MD	neuroradiology fellow	2010-2012	Staff Radiologist Captain, US Army
Sal Soman, MD	neuroradiology fellow	2010-2012	Neuroscience Fellow Palo Alto VA Medical Center Palo Alto, CA
David Rex, MD	neuroradiology fellow	2010-2012	Staff Radiologist Stanford Univ. Medical Center Stanford, CA
James Kang, MD	neuroradiology fellow	2011-2013	neuroradiology fellow
Michael Iv, MD	neuroradiology fellow	2011-2013	neuroradiology fellow
Lex Mitchell, MD	neuroradiology fellow	2011-2013	neuroradiology fellow
Neil Gupta, MD	neuroradiology fellow	2011-2013	neuroradiology fellow

**Funded Research Grants, Principal- or Co-Investigator (>30):**

1. "Phase II Study of Gadolinium-DTPA MR Contrast Agent in Patients with Multiple Sclerosis"  
PI: R. Grossman; Co-Investigator: S.W. Atlas, MD  
Berlex, Wayne, NJ 1987 - 88
2. "A Neurobehavioral Study of Schizophrenia"  
PI: R. Gur; Co-Investigator: S.W. Atlas, MD  
NIH 1990-91
3. "Phase II Clinical Study of SQ 32,692 MR Contrast Agent in Patients with Intracranial Tumors"  
PI: S.W. Atlas, MD  
Squibb Diagnostics, Princeton, NJ 1989 - 90
4. "ProHance in MR Angiography for Intracranial Vascular Disease"  
PI: S.W. Atlas, MD  
Squibb Diagnostics, Princeton, NJ 1991 - 92
5. "Signal Loss in Magnetic Resonance Angiography"  
PI: J. Listerud; Co-Investigator: S.W. Atlas, MD  
NIH 1990-1991
6. "Dynamic MR Imaging during Brain Activation"  
PI: S.W. Atlas, MD  
University of Pennsylvania Research Foundation 1993-1994
7. "Phase II Open Label Multicenter Study with Sprodiamide Injection MRI in Patients with Brain Tumors following Treatment for the Detection of Viable Tumor"  
PI: S.W. Atlas, MD  
Sterling-Winthrop, Malvern, PA 1994
8. "Betaseron Therapy for Progressive Multiple Sclerosis"  
PI: R. Whitam; Co-Investigator: S.W. Atlas, MD  
Berlex Laboratories, Richmond, California 1995-1996
9. "Phase II Clinical Trial of Gadobenate Dimeglumine in MRI Detection and Evaluation of Intracranial Lesions"  
PI: S.W. Atlas, MD  
Bracco Diagnostics, Inc., Princeton, NJ 1996-1997
10. "Development and Clinical Validation of Post-Processing Algorithms for Diffusion - Weighted MRI in Acute Cerebral Ischemia"  
PI: S.W. Atlas, MD  
General Electric Co. 1997 - 1998



11. "MR Spectroscopy in AIDS Dementia"  
PI: Brad Novia, MGH; Co-Investigator: S.W. Atlas, MD  
NIH 1997 - 1998
12. "Minorities, Risk Factor and Stroke Study"  
PI: S. Tuhim; Co-Investigator: S.W. Atlas, MD  
NIH 1997-1998
13. "Localization of Depersonalization Using Functional MRI with Behavioral Task Activation"  
PI: D Simeon; Co-Investigator: S.W. Atlas, MD  
NARSAD 1997 - 1998
14. "Functional MRI of Memory in Temporal Lobe Epilepsy"  
PI: A. Golby, M.D.; Preceptor: S.W. Atlas, M.D.  
NIH Individual National Research Service Award  
1 F32 NS10925-01 7/1/99-6/30/01
15. "Functional MRI in Sexual Arousal in Healthy Males"  
PI: B. Arnow, PhD; Co-Investigator: S.W. Atlas, MD  
TAP, Inc 7/01/00 – 6/30/01
16. "Quantitative MR of Normal Appearing White Matter in MS"  
PI: S.W. Atlas  
NIH 1 R21 NS39319-01 2/25/00 – 2/24/03
17. "Effects of Managed Care on Proliferation of MR Scanners and Advancement of MR Technology"  
PI: S.W. Atlas 1-HYE-605-61400  
Bracco Unrestricted Gift: 2002
18. "New Approach to Detect CP and Brain Injury by Term Age"  
PI: R. Ariagno, M.D.; Co-Investigator: S.W. Atlas  
R21 NS40374-01 NIH/NINDS 7/1/01 – 6/30/03
19. "Biomedical Ethics Challenges in the Emergence of In Utero/Fetal MRI"  
PI: Judy Illes, PhD; Co-Investigator S.W. Atlas  
The Childrens Health Initiative 09/01/02 – 12/31/03
20. "Ethical Challenges in Neuroimaging"  
PI: S.W. Atlas, M.D.  
The Greenwall Foundation 07/01/01 – 06/30/04
21. "Magnetic Resonance Spectroscopic Neoplasm Imaging"  
PI: D.M. Spielman, Ph.D. Co-Investigator S.W. Atlas R01 CA48269-08  
NIH/NCI 09/01/99-07/30/04

22. "fMRI and TMS Analysis of Cerebellar Cognitive Function"  
R01 MH60234 NIH  
PI: John Desmond, Ph.D. Co-Investigator S.W. Atlas 07/01/00 - 07/31/04
23. "Advanced neuroimaging: Ethical, legal and social and issues"  
R01#NS045831 NIH  
PI: J. Illes, Ph.D. ; Co-Investigator S.W. Atlas 10/01/03 – 09/30/06
24. "Low Cost High Quality Pre-Polarized MRI Head Scanner"  
1-R33-CA095882-01 NIH/NCI  
PI: A. Macovski, Ph.D.; Co-Investigator S.W. Atlas 4/01/053/31/08
25. Fulbright Scholar award (Senior Specialist Program, S.W. Atlas)  
"To foster collaboration between Dr. Atlas and China in addressing the structuring of the Chinese health care system over the next five years." 2005 - 2010
26. "The Physiological and Neural Correlates of Tai Chi: An Investigation of Physiologic Mechanisms Underlying Health Benefits of Tai Chi"  
PI: Jessica Rose, PhD; Co-PI Scott W. Atlas, MD  
Stanford Center on Longevity 2008-2009
27. "Neural Correlates of Gait and Upper Limb Motor Deficits in Preterm Children"  
PI: Jessica Rose, PhD; Co-I Scott W. Atlas, MD  
Pediatric Health Fund – Child Health Research Program 1/1/09 – 12/31/09
28. "Expanding Outpatient Services, Health Care Utilization, and State Regulation"  
PI: Laurence Baker, PhD; Co-Investigator S.W. Atlas  
Robert Wood Johnson Foundation 2007-2008
29. "Health Care for One Billion: Controlling Incentives in Rural China Health Care Delivery"  
PI: Scott W. Atlas, MD; Co-PI Scott Rozelle, PhD  
Presidential Fund for Innovation in International Studies, Freeman Spogli Institute 2007-2010
30. "Ultra-High Resolution Clinical Imaging of the Human Medial Temporal Lobe with 7T MRI"  
PI: M. Zeineh; Research Mentor and Co-Investigator S.W. Atlas  
RSNA Research Resident / Fellow Grant Application 2009 - 2011
31. "Ultra-High Resolution DTI of the Hippocampus"  
PI: M. Zeineh; Research Mentor and Co-Investigator S.W. Atlas  
GE Healthcare Seed Project Funds 2009 - 2011
32. "Short-axis EPI for Diffusion Tensor MRI at High Field"  
PI: R. Bammer; Co-Investigator S.W. Atlas  
NIH R01 EB008706 2009 - 2013
33. "Real-Time MRI Motion Correction System"  
PI: R. Bammer; Co-Investigator: S.W. Atlas  
National Institutes of Health (NIBIB) R01 EB11654 2010-2014

**Appointments and Offices Held in Professional and Scientific Societies (selected):**

AMERICAN SOCIETY OF NEURORADIOLOGY

Ad Hoc Committee on Inter-Society Liaison, 1988-1989  
Program Committee, 1988-1989  
Awards Committee, 1989-1990  
Program Committee, 1990-1991  
Intersociety Liaison to SMRI and SMRM, 1990-1991  
Intersociety Liaison to SMRI, 1991-1993  
Intersociety Liaison to SMR, 1994-present  
Elected Member-at-Large, Executive Committee, 1995-1997  
Member, Curriculum Development Subcommittee of Education, 1995-1999  
Member, ASNR Program Directors Subcommittee, 2000-2004

SYMPOSIUM NEURORADIOLOGICUM XVI

Scientific Program Committee, 1997  
Scientific Program Committee, 2010

INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE IN MEDICINE

Education and Publications Committee, 1989-1990  
*Co-Editor*, SMRM Newsletter, 1989-1990  
Magnetic Resonance Core Curriculum Committee, 1990-1991  
Program Committee, 1991-1992  
Co-Chair, Clinical Neuro MR Course, 1999 Annual Meeting  
Chair, Advanced Neuro MR Course, 2000 Annual Meeting  
Co-Chair, Neuro MR Course, 2001 Annual Meeting

SOCIETY FOR MAGNETIC RESONANCE IMAGING

Committee on Resident Training, 1989-1990  
Magnetic Resonance Core Curriculum Committee, 1990-1991  
Technical Exhibits Committee, 1990-1991  
*Board of Directors*, 1991-1994  
*Chairman*, Scientific Poster Committee, 1991-1992  
*Chairman*, Neuroimaging Committee, 1991-1992  
Intersociety Liaison Committee, 1991-1992  
*Chairman*, Tutorial Committee, 1992-1993  
*Chairman*, Neuroimaging Committee, 1992-1994  
Nominating Committee, 1992-1993

AMERICAN HEART ASSOCIATION STROKE COUNCIL

AMERICAN BOARD OF RADIOLOGY

*Contributor*, Written Board Examination for certification, 1990  
*Examiner*, Oral Board Examination for Radiology certification, 1992-2000  
*Examiner*, Oral CAQ Examination for Neuroradiology certification, 1995-2003  
ABR Committee for Neuroradiology Certification (CAQ), 1995-2000  
Neuroradiology Line Writer, Written Board Examination for certification 1995-1997

AMERICAN COLLEGE OF RADIOLOGY

Committee on Human Resources, Commission on Neuroradiology and  
Magnetic Resonance, 1991-1997  
Committee on Education in MRI and Neuroradiology, 1996 - 2004

Task Force on Continuing Competence (Neuroradiology), 1997 – 2004  
ACRIN CNS Committee, 1999 - 2001

NOBEL PRIZE NOMINATING COMMITTEE FOR MEDICINE AND PHYSIOLOGY FOR 2004  
NOBEL PRIZE NOMINATING COMMITTEE FOR MEDICINE AND PHYSIOLOGY FOR 2006  
NOBEL PRIZE NOMINATING COMMITTEE FOR MEDICINE AND PHYSIOLOGY FOR 2007  
NOBEL PRIZE NOMINATING COMMITTEE FOR MEDICINE AND PHYSIOLOGY FOR 2008  
NOBEL PRIZE NOMINATING COMMITTEE FOR MEDICINE AND PHYSIOLOGY FOR 2010  
NOBEL PRIZE NOMINATING COMMITTEE FOR MEDICINE AND PHYSIOLOGY FOR 2011  
NOBEL PRIZE NOMINATING COMMITTEE FOR MEDICINE AND PHYSIOLOGY FOR 2012  
NOBEL PRIZE NOMINATING COMMITTEE FOR MEDICINE AND PHYSIOLOGY FOR 2020

**Editorial Positions and Reviewer Activities for Scientific Meetings and Journals:**

**Prior Editorial Positions:**

Consultant to the Editor, *Radiology*  
Editor-in-Chief, *Topics in MRI*  
Editorial Board, *American Journal of Neuroradiology*  
Editorial Board, *International Journal of Neuroradiology*  
Editorial Board, *Magnetic Resonance Imaging*  
Associate Editor, *Radiology*  
Associate Editor, *Journal of Magnetic Resonance Imaging*  
Editorial Board, *Journal of Magnetic Resonance Imaging*  
Editorial Board, *SMRM Pulse*  
Co-Editor, *SMRM Newsletter*

**Prior Reviewer Activities for Journals:**

*Radiology*  
*American Journal of Neuroradiology*  
*Annals of Neurology*  
*Cancer*  
*Journal of Magnetic Resonance Imaging*  
*Investigative Radiology*  
*Magnetic Resonance Imaging*  
*Magnetic Resonance in Medicine*  
*British Journal of Ophthalmology*  
*Neurology*  
*Journal of the Neurological Sciences*  
*Topics in MRI*

**Prior Reviewer Activities for Scientific Meetings:**

*Society for Magnetic Resonance in Medicine*  
*Society for Magnetic Resonance*  
*International Society of Magnetic Resonance in Medicine*  
*American Society of Neuroradiology*  
*Society for Magnetic Resonance Imaging*  
*American Roentgen Ray Society*

**Patents:**

Three Dimensional Fourier Transform, Fast Spin Echo, Black Blood Magnetic Resonance Angiography  
*Patent Number 5,271,399*

**Prior Educational and Teaching Responsibilities:**

*1998-2012:*

Designed structure of Neuroradiology Fellowship and rotations for fellows

Designed structure of Neuroradiology rotations for radiology residents

Designed and taught annual, three month "Introduction to Neuroradiology" lecture series for residents, fellows, and other neuroscience departments

Daily teaching sessions for Neuroradiology fellows and Radiology residents on Neuroradiology rotations

Primary teacher for weekly Neuroradiology Interesting Case conference

Primary teacher for Neuroradiology elective course for neurology/neurosurgery residents

Neuroradiology weekly teaching conferences for radiology residents (rotate with other neuroradiology staff)

Neuroscience Grand Rounds weekly interdepartmental teaching conferences

Pediatric Neuroradiology - Pediatric Neurology bi-weekly correlative conferences (rotate with other neuroradiology staff)

Adult Neurooncology – Neuroradiology weekly staging conferences (rotate with other neuroradiology staff)

Pediatric Neurooncology -Pediatric Neuroradiology weekly correlative conferences (rotate with other neuroradiology staff)

Primary teacher for Neuroradiology elective course for visiting residents in radiology, neurology, and neurosurgery

Primary teacher for Visiting Scholars in Neuroradiology

**Educational Course Directorships, National and International:**

**1990s:**

Co-Director

Gadolinium Contrast Agents in MRI: Clinical and Economic Considerations

Educational Symposium, Temple University and Sanofi-Winthrop  
Grand Hyatt New York  
New York, NY  
February 29, 1992

Co-Director  
Gadolinium Contrast Agents in MRI: Clinical and Economic Considerations  
Educational Symposium, Temple University and Sanofi-Winthrop  
Los Angeles Sheraton Hotel  
Los Angeles, California  
April 4, 1992

Co-Director  
Gadolinium Contrast Agents in MRI: Clinical and Economic Considerations  
Educational Symposium, Temple University and Sanofi-Winthrop  
Berlin, Germany  
August 12, 1992

Co-Chair  
Educational Program: Neuroimaging Session  
Introductory MRI: Techniques and Clinical Applications  
1999 Annual Meeting, International Society of Magnetic Resonance in Medicine  
Philadelphia, Pennsylvania  
May 22, 1999

**2000:**  
Chair  
Educational Program: Neuroimaging Session  
Advanced Neuro MR: Technical Considerations and Clinical Applications  
2000 Annual Meeting, International Society of Magnetic Resonance in Medicine  
Denver, Colorado  
April 2, 2000

Chair  
Educational Program: Neuroimaging Session  
Advanced Neuro MR: Technical Considerations and Clinical Applications  
2000 Annual Meeting  
International Society of Magnetic Resonance in Medicine  
Denver, Colorado  
April 2, 2000

Course Director  
Radiology for The Next Millenium  
MR Advances in Neuroradiology and Musculoskeletal Imaging



Stanford University Medical Center, Department of Radiology  
San Francisco, California  
June 18-20, 2000

**2001:**

Course Director  
Radiology for The Next Millenium  
MR Advances in Neuroradiology and Musculoskeletal Imaging  
Stanford University Medical Center, Department of Radiology  
Bellagio Hotel, Las Vegas, Nevada  
February 15-18, 2001

Co-Chair  
Educational Program: Neuroimaging Session  
Neuro MR: Technical Considerations and Clinical Applications  
2001 Annual Meeting  
International Society of Magnetic Resonance in Medicine  
Glasgow, Scotland  
April , 2001

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head and Neck  
The Plaza Hotel  
New York, New York  
November, 2001

**2002:**

Course Co-Director  
MR Advances in Neuroradiology and Sports Medicine  
Stanford University Medical Center, Department of Radiology  
Bellagio Hotel  
Las Vegas, Nevada  
February, 2002

Course Co-Director  
International Symposium on Clinical MRI at High Field  
Stanford University Medical Center, Department of Radiology  
Four Seasons Hotel  
Las Vegas, Nevada  
October, 2002

**2003:**

Course Co-Director  
MR Advances in Neuroradiology and Sports Medicine  
Stanford University Medical Center, Department of Radiology  
Bellagio Hotel  
Las Vegas, Nevada

February, 2003

Course Co-Director  
Second International Symposium on Clinical MRI at High Field  
Stanford University Medical Center, Department of Radiology  
Bellagio Hotel  
Las Vegas, Nevada  
October, 2003

**2004:**

Course Co-Director  
MR Advances in Neuroradiology and Sports Medicine  
Stanford University Medical Center, Department of Radiology  
Bellagio Hotel  
Las Vegas, Nevada  
February, 2004

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head and Neck  
Venetian Hotel  
Las Vegas, Nevada  
May, 2004

Course Co-Director  
Third International Symposium on Clinical MRI at High Field  
Stanford University Medical Center, Department of Radiology  
Bellagio Hotel  
Las Vegas, Nevada  
October, 2004

**2005:**

Course Co-Director  
MR Advances in Neuroradiology and Sports Medicine  
Stanford University Medical Center, Department of Radiology  
Bellagio Hotel  
Las Vegas, Nevada  
February, 2005

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head and Neck  
The Wynn Resort  
Las Vegas, Nevada  
May, 2005

Course Co-Director  
Fourth International Symposium on Clinical MRI at High Field  
Stanford University Medical Center, Department of Radiology

The Wynn Resort  
Las Vegas, Nevada  
October, 2005

**2006:**

Course Co-Director  
MR Advances in Neuroradiology and Sports Medicine  
Stanford University Medical Center, Department of Radiology  
Bellagio Hotel  
Las Vegas, Nevada  
March, 2006

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head and Neck  
The Wynn Resort  
Las Vegas, Nevada  
May, 2006

Course Co-Director  
Fifth International Symposium on Clinical MRI at High Field  
Stanford University Medical Center, Department of Radiology  
The Wynn Resort  
Las Vegas, Nevada  
October, 2006

**2007:**

Course Co-Director  
MR Advances in Neuroradiology and Sports Medicine  
Stanford University Medical Center, Department of Radiology  
Bellagio Hotel  
Las Vegas, Nevada  
March, 2007

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head and Neck  
The Wynn Resort  
Las Vegas, Nevada  
May, 2007

Course Co-Director  
Sixth International Symposium on Clinical MRI at High Field  
Stanford University Medical Center, Department of Radiology  
The Wynn Resort  
Las Vegas, Nevada  
October, 2007

**2008:**

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head and Neck  
Four Seasons Hotel  
Las Vegas, Nevada  
April, 2008

Course Co-Director  
MR Advances in Neuroradiology and Sports Medicine  
Stanford University Medical Center, Department of Radiology  
Wynn Resort  
Las Vegas, Nevada  
May, 2008

Course Co-Director  
Health, Education, and Development in Emerging China  
Bing Overseas Seminar Program  
Stanford University, in collaboration with Renmin University  
Beijing, China  
September, 2008

Course Co-Director  
Seventh International Symposium on Clinical MRI at High Field  
Stanford University Medical Center, Department of Radiology  
Bellagio Hotel, Las Vegas, Nevada  
October, 2008

**2009:**

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head and Neck  
Four Seasons Hotel  
Las Vegas, Nevada  
May, 2009

**2010:**

Course Co-Director  
Stoller & Atlas: Musculoskeletal and Neuro MRI  
Wynn Resort and Hotel  
Las Vegas, Nevada  
January, 2010

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head and Neck  
Wynn Resort and Hotel  
Las Vegas, Nevada  
May, 2010

Course Director

Scott Atlas' Neuroradiology Immersion  
Mauna Lani Hotel  
Kona, Hawaii  
November, 2010

**2011:**

Course Co-Director  
Stoller & Atlas: Musculoskeletal and Neuro MRI  
Wynn Resort and Hotel  
Las Vegas, Nevada  
January, 2011

Course Co-Director  
Stoller & Atlas: Musculoskeletal and Neuro MRI  
Wynn Resort and Hotel  
Las Vegas, Nevada  
April, 2011

Course Co-Director  
Atlas – Edelman – Ascher: Brain and Body MRI Case Tutorial  
Wynn Resort and Hotel  
Las Vegas, Nevada  
October, 2011

**2012:**

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Resort and Hotel  
Las Vegas, Nevada  
March, 2012

**2013:**

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Resort and Hotel  
Las Vegas, Nevada  
March, 2013

**2014:**

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Resort and Hotel  
Las Vegas, Nevada  
March, 2014

Course Co-Director  
Zurich Course on Diagnostic and Interventional Neuroradiology  
University Hospital of Zurich  
Zurich, Switzerland  
August, 2014

**2015:**

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Resort and Hotel  
Las Vegas, Nevada  
February, 2015

Course Director  
Scott Atlas' Neuroradiology Tutorial  
Renaissance Hotel  
Sao Paulo, Brazil  
April, 2015

Course Co-Director  
Zurich Course on Diagnostic and Interventional Neuroradiology  
University Hospital of Zurich  
Zurich, Switzerland  
August, 2015

**2016:**

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Resort and Hotel  
Las Vegas, Nevada  
February, 2016

**2016:**

Course Co-Director  
Zurich Course on Diagnostic and Interventional Neuroradiology  
University Hospital of Zurich  
Zurich, Switzerland  
August, 2016

Visiting President  
Update in Neuro Imaging  
Site Oud Sint-Jan  
Bruges, Belgium  
October, 2016

**2017:**

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Resort and Hotel  
Las Vegas, Nevada  
February, 2017

Course Co-Director  
Hoover Institution Summer Policy Boot Camp  
Hoover Institution, Stanford University  
Stanford, California  
August, 2017

**2018:**

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Resort and Hotel  
Las Vegas, Nevada  
February, 2018

Course Co-Director  
Hoover Institution Summer Policy Boot Camp  
Hoover Institution, Stanford University  
Stanford, California  
August, 2018

**2019:**

Course Co-Director  
Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Resort and Hotel  
Las Vegas, Nevada  
February, 2019

Course Co-Director  
Hoover Institution Summer Policy Boot Camp  
Hoover Institution, Stanford University  
Stanford, California  
August, 2019



**Visiting Professorships and Lectures by Invitation (>600):**

1987

"MR Imaging of the Orbit"

Neuroradiology MR Fellowship Course  
University of California, San Francisco  
San Francisco, California  
June 8, 1987

"MR Imaging of Intracranial Hemorrhage and Related Disorders"

Neuroradiology MR Fellowship Course  
University of California, San Francisco  
San Francisco, California  
June 9, 1987

"Fast Scanning: Applications to the CNS"

Neuroradiology Section - MR Lecture Series  
University of California, San Francisco  
San Francisco, California  
August 4, 1987

"MR of Intracranial Hemorrhage"

Neuroradiology Section - MR Lecture Series  
University of California, San Francisco  
San Francisco, California  
September 1, 1987

"Intracranial Hemorrhage: MR Imaging"

University of California Body MR Fellowship Course  
University of California, San Francisco  
San Francisco, California  
July 15, 1987

"Fast Scanning: CNS Applications"

Clinical Magnetic Resonance Imaging Course  
University of California, San Francisco  
Hyatt Regency Hotel  
San Francisco, California  
October 19, 1987

"Supratentorial Tumors: MR Imaging"

Clinical Magnetic Resonance Imaging Course  
University of California, San Francisco  
Hyatt Regency Hotel  
San Francisco, California  
October 20, 1987

"MR of the Orbit"

Clinical Magnetic Resonance Imaging Course  
University of California, San Francisco  
Hyatt Regency Hotel  
San Francisco, California  
October 21, 1987

"Isolated Palsies of Cranial Nerves 3, 4 and 6: Current Imaging Applications"

Ophthalmology Grand Rounds  
University of California, San Francisco  
San Francisco, California  
October 29, 1987

"Fast Scanning: Applications to the CNS"

University of California Body MR Fellowship Course  
University of California, San Francisco  
San Francisco, California  
November 12, 1987

1988

"Intracranial Hemorrhage: MR Imaging Applications"

Yale University School of Medicine  
New Haven, Connecticut  
Radiology Daily Conference  
February 17, 1988

"Rapid MR Imaging: Applications in the CNS"

Yale University School of Medicine  
New Haven, Connecticut  
Radiology Grand Rounds  
February 17, 1988

"MR Imaging of Intracranial Hemorrhage: Concepts and Applications"

Society for Magnetic Resonance Imaging Annual Meeting  
Educational Program  
Boston, Massachusetts  
February 28, 1988

"Rapid MR Imaging: CNS Applications "

Pacific Northwest Radiological Society  
1988 Annual Meeting  
Portland, Oregon  
April 30, 1988

"MR Anatomy of the Brain and Spine"

MR for Technologists - 1988 Annual Meeting  
Hospital of the University of Pennsylvania  
Penn Towers Hotel  
Philadelphia, Pennsylvania  
June 26, 1988

"Clinical Applications of Fast Scanning"

MR for Technologists - 1988 Annual Meeting  
Hospital of the University of Pennsylvania  
Penn Towers Hotel  
Philadelphia, Pennsylvania  
June 26, 1988

"MR Imaging of the Orbit: Current Status"

MR Fellowship Course  
Barrow Neurological Institute  
Phoenix, Arizona  
August 15, 1988

"MR Imaging of Intracranial Hemorrhage and Related Lesions"

MR Fellowship Course  
Barrow Neurological Institute  
Phoenix, Arizona  
August 15, 1988

"Fast Scanning: Applications to the CNS"

MR Fellowship Course  
Barrow Neurological Institute  
Phoenix, Arizona  
August 16, 1988

1989

"MRI in Neuroradiology: Clinical Applications"

The Utility of MRI in Clinical Neurodiagnosis  
Albert Einstein Medical Center Department of Radiology  
Sheraton Hotel  
New Rochelle, New York  
January 18, 1989

"MR Imaging of Hemorrhage: Relaxation Mechanisms and Clinical Applications"

Neuroradiology Advanced MR Fellowship Course  
University of California, San Francisco  
San Francisco, California  
February 23, 1989

"MR of the Orbit: Current Status"

Neuroradiology Advanced MR Fellowship Course  
University of California, San Francisco  
San Francisco, California  
February 23, 1989

"Fast Scanning: Concepts and CNS Applications"

Neuroradiology Advanced MR Fellowship Course  
University of California, San Francisco  
San Francisco, California  
February 24, 1989

"MR Imaging of Intracranial Hemorrhage and Related Lesions"

Educational Program, 1989 Annual Meeting, Society for Magnetic Resonance Imaging  
Los Angeles, California  
February 25, 1989

"MR of Intraaxial Tumors"

Neuroradiology at Vail  
Hospital of the University of Pennsylvania  
Vail, Colorado  
March 27-31, 1989

"Anatomy and Pathology of the Orbit: MR Imaging""

Neuroradiology at Vail  
Hospital of the University of Pennsylvania  
Vail, Colorado  
March 27-31, 1989

"Clinical Applications of Fast Scanning in Neuroimaging"

Neuroradiology at Vail  
Hospital of the University of Pennsylvania  
Vail, Colorado  
March 27-31, 1989

"Advanced MR Imaging Techniques in Neuroradiology"

Radiological Society of New York Medical College  
1989 Annual Meeting  
Valhalla, New York  
May 11, 1989

"Orbit: State of the Art MR Imaging""

Visiting Professor  
Department of Radiology  
New York Medical College  
Valhalla, New York  
May 12, 1989

"Orbit: Current State of the Art MR Imaging""

Clinical MRI: 1989 Update  
Department of Radiology  
Massachusetts General Hospital  
Harvard Medical School  
Boston, Massachusetts  
May 17, 1989

"CNS Infections and AIDS: Role of MR Imaging""

Clinical MRI: 1989 Update  
Department of Radiology  
Massachusetts General Hospital  
Harvard Medical School  
Boston, Massachusetts  
May 17, 1989

"Concepts and Clinical Applications of Fast Imaging to the CNS"

Eastern Neuroradiological Society  
First Annual Meeting  
New York, New York  
July 8, 1989

"MR Imaging of Hemorrhage: Concepts and Misconceptions"

Neuroradiology Advanced MR Fellowship Course  
University of California, San Francisco  
San Francisco, California  
September 28, 1989

"MR of the Orbit: Current Status"

Neuroradiology Advanced MR Fellowship Course  
University of California, San Francisco  
San Francisco, California  
September 28, 1989

"Fast Scanning: Concepts and CNS Applications"

Neuroradiology Advanced MR Fellowship Course  
University of California, San Francisco  
San Francisco, California  
September 28, 1989

"Brain Infection and AIDS: MR Imaging"

Neuroradiology Advanced MR Fellowship Course  
University of California, San Francisco  
San Francisco, California  
September 28, 1989

"Intracranial Tumors: Role of MR Imaging"

Neuroradiology Advanced MR Fellowship Course  
University of California, San Francisco  
San Francisco, California  
September 28, 1989

"Surface Coil Applications of the Orbit"

Magnetic Resonance Imaging: Techniques and Imaging Methodology  
Department of Radiology  
University of Pennsylvania  
Philadelphia, Pennsylvania  
November 6-10, 1989

"New Applications of Gradient Echo Imaging in the Brain"

Magnetic Resonance Imaging: Techniques and Imaging Methodology  
Department of Radiology  
University of Pennsylvania  
Philadelphia, Pennsylvania  
November 6-10, 1989

"Workshop: Clinical Uses of Gradient Echo Imaging"

Magnetic Resonance Imaging: Techniques and Imaging Methodology  
Department of Radiology  
University of Pennsylvania  
Philadelphia, Pennsylvania  
November 6-10, 1989

"Controversies in MR Imaging"

Magnetic Resonance Imaging: Techniques and Imaging Methodology  
Department of Radiology  
University of Pennsylvania  
Philadelphia, Pennsylvania  
November 6-10, 1989

"Advances in Neuroradiologic MR Imaging"

Visiting Professor  
Department of Radiology  
Charlotte Memorial Hospital  
Charlotte, North Carolina  
November 21, 1989

"MR Imaging of Intracranial Hemorrhage"

Visiting Professor  
Department of Radiology  
Charlotte Memorial Hospital  
Charlotte, North Carolina  
November 21, 1989

"Fast MR Imaging: CNS Applications"

Refresher Course  
1989 RSNA Annual Meeting  
Chicago, Illinois  
November 30, 1989

1990

"MR of Hemorrhage: Concepts and Clinical Applications"

Educational Course  
Society of Magnetic Resonance Imaging  
1990 Annual Meeting  
Washington, D.C.  
February 23, 1990

"Fast Scanning: Concepts and CNS Applications"

Neuroradiology at Snowbird  
University of Pennsylvania  
Snowbird, Utah  
February 25 - March 2, 1990

"Brain Infection and AIDS: MR Imaging"

Neuroradiology at Snowbird  
University of Pennsylvania  
Snowbird, Utah  
February 25 - March 2, 1990

"Intracranial Tumors: Role of MR Imaging"

Neuroradiology at Snowbird  
University of Pennsylvania  
Snowbird, Utah  
February 25 - March 2, 1990

"MR Imaging of the Orbit"

Neuroradiology at Snowbird  
University of Pennsylvania  
Snowbird, Utah  
February 25 - March 2, 1990

"Degenerative Disease of the Spine"

Neuroradiology at Snowbird  
University of Pennsylvania  
Snowbird, Utah  
February 25 - March 2, 1990



"MR of Hemorrhage: Concepts and Clinical Applications"

Magnetic Resonance Imaging  
Fourth Annual Barrow Neurological Institute Meeting  
Scottsdale, Arizona  
March 3-7, 1990

"MR Imaging of the Orbit"

Magnetic Resonance Imaging  
Fourth Annual Barrow Neurological Institute Meeting  
Scottsdale, Arizona  
March 3-7, 1990

"Fast Scanning: Current CNS Applications"

MR Imaging: Principles and Methodology  
University of Pennsylvania  
Grindelwald, Switzerland  
March, 1990

"Intracranial Tumors: Role of MR Imaging"

MR Imaging: Principles and Methodology  
University of Pennsylvania  
Grindelwald, Switzerland  
March, 1990

"Controversies in MR Imaging"

MR Imaging: Principles and Methodology  
University of Pennsylvania  
Grindelwald, Switzerland  
March, 1990

"Degenerative Disease of the Spine"

MR Imaging: Principles and Methodology  
University of Pennsylvania  
Grindelwald, Switzerland  
March, 1990

"Intraaxial Brain Tumors in Adults"

Annual Course  
American Society of Neuroradiology Annual Meeting  
Los Angeles, CA  
March, 1990

"MRI of the Orbits"

Visiting Professor  
Department of Radiology, St. Francis Regional Medical Center  
Wichita, KS  
April 18, 1990

"MRI of Brain Tumors"

The Neuroscience Society and MRI City-Wide Conference  
St. Francis Regional Medical Center  
Wichita, KS  
April 18, 1990

"MRI of the Orbits: Current Techniques and Applications"

Visiting Professor  
Department of Radiology  
Cleveland, OH  
April 24, 1990

"Fast Imaging: Principles, Techniques and Clinical Applications"

Visiting Professor  
Radiology Grand Rounds  
Department of Radiology  
Massachusetts General Hospital  
Boston, MA  
May 2, 1990

"Intraaxial Brain Tumors: MR-Histopathology Correlations"

Guest Lecturer, Boston Neuroradiology Society Meeting  
Department of Radiology  
Massachusetts General Hospital  
Boston, MA  
May 2, 1990

"Clinical Applications of Fast Scanning"

1990 Harvard Postgraduate Course on Basic and Current Concepts in  
Neuroradiology, Head and Neck Radiology, and Neuro-MRI  
Department of Radiology  
Massachusetts General Hospital  
Lafayette Hotel  
Boston, MA  
October 2, 1990

"Adult Intraaxial Tumors"

1990 Harvard Postgraduate Course on Basic and Current Concepts in  
Neuroradiology, Head and Neck Radiology, and Neuro-MRI  
Department of Radiology  
Massachusetts General Hospital  
Lafayette Hotel  
Boston, MA  
October 2, 1990

"Fast Imaging: Principles and Clinical Applications"

Visiting Professor  
Radiology Grand Rounds  
Department of Radiology  
Eastern Virginia Medical School  
Norfolk, VA  
October 3-4, 1990

"Intraaxial Brain Tumors: MR-Pathology Correlations"

Guest Lecturer  
Tidewater Radiological Society  
Norfolk, VA  
October 3, 1990

"Fast Imaging: Principles and Clinical Applications"

Advanced Neuroradiology Seminar  
Department of Radiology  
University of South Florida  
Orlando, FL  
October 24-27, 1990

"MRI of the Orbits: Current Techniques and Applications"

Advanced Neuroradiology Seminar  
Department of Radiology  
University of South Florida  
Orlando, FL  
October 24-27, 1990

"MR of Hemorrhage: Concepts and Clinical Applications"

Advanced Neuroradiology Seminar  
Department of Radiology  
University of South Florida  
Orlando, FL  
October 24-27, 1990

"Advanced MR Imaging of the Spine: Contrast Considerations for Image Optimization"

Radiological Society of North America  
76th Anniversary Scientific Assembly and Annual Meeting  
Chicago, IL.  
November 25 - November 30, 1990

1991

"MRI of Brain Tumors: Correlations to Neuropathology"

New Brunswick MRI Society  
Rutgers University Medical Center  
January 30, 1991

"MRI of Intraaxial Brain Tumors"

Magnetic Resonance Imaging  
Fifth Annual Barrow Neurological Institute Meeting  
Scottsdale, Arizona  
March 16-20, 1991

"MRI of Hemorrhage: Current Concepts"

Magnetic Resonance Imaging  
Fifth Annual Barrow Neurological Institute Meeting  
Scottsdale, Arizona  
March 16-20, 1991

"Fast Scanning: Brain and Spine"

Magnetic Resonance Imaging  
Fifth Annual Barrow Neurological Institute Meeting  
Scottsdale, Arizona  
March 16-20, 1991

"Fast Scanning: Concepts and Applications in Brain Imaging"

MRI Update 1991  
University of Pennsylvania  
Vail, Colorado  
March 25 - March 30, 1991

"Brain Infection and AIDS: MR Imaging"

MRI Update 1991  
University of Pennsylvania  
Vail, Colorado  
March 25 - March 30, 1991

"Intraaxial Brain Tumors: Correlations of MR Imaging and Histopathology"

MRI Update 1991  
University of Pennsylvania  
Vail, Colorado  
March 25 - March 30, 1991

"MR Imaging of the Orbit: Current Status"

MRI Update 1991  
University of Pennsylvania  
Vail, Colorado  
March 25 - March 30, 1991

"Degenerative Disease of the Spine"

MRI Update 1991  
University of Pennsylvania  
Vail, Colorado  
March 25 - March 30, 1991

"Fast Imaging of the Brain"

Special Topics Seminar on Fast Imaging  
1991 Annual Meeting of the SMRI  
Chicago, Illinois  
April 14, 1991

"Fast Spin Echo (FSE) MR Imaging: Blinded Comparison with Conventional Spin Echo Imaging for the Detection of Focal Brain Lesions"

HUP Alumni Symposium  
Recent Advances in MR Imaging  
University of Pennsylvania  
Philadelphia, Pennsylvania  
June 21, 1991

"Intraaxial Brain Tumors: Correlations of MR Imaging and Histopathology"

Visiting Professor  
Stanford University  
Stanford, California  
July 18, 1991

"Intraaxial Brain Tumors: MR-Histopathology Correlations"

1991 Harvard Postgraduate Course on Basic and Current Concepts in  
Neuroradiology, Head and Neck Radiology, and Neuro-MRI  
Department of Radiology  
Massachusetts General Hospital  
Lafayette Hotel  
Boston, MA  
September 23- 27, 1991

"Clinical Applications of Fast Scanning"

1991 Harvard Postgraduate Course on Basic and Current Concepts in  
Neuroradiology, Head and Neck Radiology, and Neuro-MRI  
Department of Radiology  
Massachusetts General Hospital  
Boston, MA  
September 23- 27, 1991

"MR of Intracranial Hemorrhage: Current Concepts"

1991 Harvard Postgraduate Course on Basic and Current Concepts in  
Neuroradiology, Head and Neck Radiology, and Neuro-MRI  
Department of Radiology  
Massachusetts General Hospital  
Lafayette Hotel  
Boston, MA  
September 23- 27, 1991

"Gliomas: Magnetic Resonance Imaging"

Third Pan-Philadelphia Neurosurgery Conference: The Glioma  
Four Seasons Hotel  
Philadelphia, PA  
October 11-12, 1991

"Fast Scanning: CNS Applications"

State-of-the-Art MR Imaging Course  
University of Pennsylvania  
Ritz-Carlton Hotel  
Philadelphia, PA  
October 23-24, 1991

"Magnetic Resonance Angiography"

Refresher Course  
Radiological Society of North America  
77th Anniversary Scientific Assembly and Annual Meeting  
Chicago, IL  
December 1-6, 1991

"Magnetic Resonance Imaging of Intracranial Hemorrhage: Current Status"

Refresher Course  
Radiological Society of North America  
77th Anniversary Scientific Assembly and Annual Meeting  
Chicago, IL  
December 1-6, 1991

1992

"MR Angiography in Neurologic Disease: Current Status"

Neurology Grand Rounds  
University of Pennsylvania School of Medicine  
Philadelphia, PA  
January 23, 1992

"MR Angiography: Fact or Fiction"

Innovational Approaches to the CNS Symposium  
Philadelphia Neurosurgical Rounds  
Philadelphia, PA  
January 23, 1992

"Advanced Brain Imaging"

MR Imaging of the Brain, Spine, Head and Neck  
University of Pennsylvania  
Four Seasons Hotel  
Maui, Hawaii  
February 10-14, 1992

"Cranial Nerves III, IV, and VI: Eye Movement and Gaze Disorders"

MR Imaging of the Brain, Spine, Head and Neck  
University of Pennsylvania  
Four Seasons Hotel  
Maui, Hawaii  
February 10-14, 1992

"Brain Tumors: Correlations of MR and Histopathology"

MR Imaging of the Brain, Spine, Head and Neck  
University of Pennsylvania  
Four Seasons Hotel  
Maui, Hawaii  
February 10-14, 1992

"MRI of Vascular Malformations and Aneurysms: Current Status"

MR Imaging of the Brain, Spine, Head and Neck  
University of Pennsylvania  
Four Seasons Hotel  
Maui, Hawaii  
February 10-14, 1992

"Fast Imaging of the CNS"

Visiting Professor  
Department of Radiology  
Indiana University Medical Center  
Indianapolis, IN  
February 25, 1992

"Intraaxial Brain Tumors: MR-Pathology Correlations"

Visiting Professor  
Department of Radiology  
Indiana University Medical Center  
Indianapolis, IN  
February 25, 1992

"MR Angiography in Neurologic Disease: Current Status"

Visiting Professor  
Department of Radiology  
Indiana University Medical Center  
Indianapolis, IN  
February 25, 1992



"Contrast Agents in MRI of the Brain and Spine: Rationale and Clinical Applications"

Co-Executive Editor and Speaker  
Gadolinium Contrast Agents in MRI: Clinical and Economic Considerations  
Educational Symposium  
Temple University and Sanofi-Winthrop  
Grand Hyatt New York  
New York, NY  
February 29, 1992

"MR of the Orbit and Eye Movement"

Annual MRI Course  
Cleveland Marriott Hotel  
Cleveland, Ohio  
March 6, 1992

"Intraaxial Brain Tumors: Correlations of MR Imaging and Histopathology"

MRI Update 1992  
University of Pennsylvania  
Vail, Colorado  
March 16 - March 20, 1992

"Fast MR Imaging: Applications in the Brain and Spine"

MRI Update 1992  
University of Pennsylvania  
Vail, Colorado  
March 16 - March 20, 1992

"MR of Intracranial Hemorrhage: Current Theory and Applications"

MRI Update 1992  
University of Pennsylvania  
Vail, Colorado  
March 16 - March 20, 1992

"Intracranial MR Angiography"

MRI Update 1992  
University of Pennsylvania  
Vail, Colorado  
March 16 - March 20, 1992

"MR Angiography in Neurologic Disease: Current Status"

MRI for the 90's  
Hospital of the Good Samaritan  
Los Angeles, California  
March 28, 1992

"Intraaxial Brain Tumors: Correlations of MR Imaging and Histopathology"

MRI for the 90's  
Hospital of the Good Samaritan  
Los Angeles, California  
March 28, 1992

"MR Imaging of the Spine: Degenerative Disc Disease and Recent Advances"

MRI for the 90's  
Hospital of the Good Samaritan  
Los Angeles, California  
March 28, 1992

"Contrast Agents in MRI of the Brain and Spine: Rationale and Clinical Applications"

Co-Executive Editor and Speaker  
Gadolinium Contrast Agents in MRI: Clinical and Economic Considerations  
Educational Symposium, Temple University and Sanofi-Winthrop  
Los Angeles Sheraton Hotel  
Los Angeles, California  
April 4, 1992

"Fast MR Imaging in Neurologic Disease"

Educational Course for Physicians  
Society for Magnetic Resonance Imaging Annual Meeting  
New York Hilton  
New York, New York  
April 25, 1992

"MR Angiography: Current Status"

Lehigh Hospital MR Symposium  
Lehigh Hospital  
Allentown, Pennsylvania  
May 1, 1992

"MR Angiography in Neurologic Disease: Current Status"

Central New Jersey MR Society  
University of Medicine and Dentistry  
Lehigh Imaging Center  
New Brunswick, New Jersey  
June 24, 1992

"MR Angiography: Current Status"

Visiting Professor  
Maine Medical Center  
Portland, Maine  
July 14, 1992

“Intracranial Tumors: Correlations of MR to Histopathology”

Visiting Professor  
Maine Medical Center  
Portland, Maine  
July 14, 1992

“Gradient Echo Imaging in the CNS: Applications and Pitfalls

Advanced Neuro MRI Course  
Hoag Memorial Hospital  
Laguna Niguel, California  
July 26-29, 1992

“Intracranial Tumors: Correlations of MR to Histopathology”

Advanced Neuro MRI Course  
Hoag Memorial Hospital  
Laguna Niguel, California  
July 26-29, 1992

“Fast Spin Echo Imaging: Applications in the CNS”

Advanced Neuro MRI Course  
Hoag Memorial Hospital  
Laguna Niguel, California  
July 26-29, 1992

"Contrast Agents in MRI of the Brain and Spine: Rationale and Clinical Applications"

Co-Executive Editor and Speaker  
Gadolinium Contrast Agents in MRI: Clinical and Economic Considerations  
Educational Symposium, Temple University and Sanofi-Winthrop  
Berlin, Germany  
August 12, 1992

“Fast Spin Echo Imaging: CNS Applications”

Society of Magnetic Resonance in Medicine Annual Meeting  
Berlin, Germany  
August 12, 1992

“Intracranial Hemorrhage: More than You Need to Know”

1992 Harvard Postgraduate Course on Basic and Current Concepts in  
Neuroradiology, Head and Neck Radiology, and Neuro-MRI  
Department of Radiology  
Massachusetts General Hospital  
Lafayette Hotel  
Boston, MA  
September 20- 24, 1992

“Fast Spin Echo Imaging: Principles and Brain Applications”

MRI-Clinical State-of-the-Art  
NYU School of Medicine  
October 11-15, 1992

“Fast Imaging of the Spine: Principles and Brain Applications”

MRI-Clinical State-of-the-Art  
NYU School of Medicine  
October 11-15, 1992

“Intracranial MR Angiography”

MRI-Clinical State-of-the-Art  
NYU School of Medicine  
October 11-15, 1992

“Intracranial MR Angiography”

MR Angiography: Principles and Clinical Applications  
Lisbon, Portugal  
November 14-15, 1992

“MR Angiography of the Extracranial Carotid”

MR Angiography: Principles and Clinical Applications  
Lisbon, Portugal  
November 14-15, 1992

“Intracranial Hemorrhage: Current Understanding”

Refresher Course  
Radiological Society of North America  
78th Anniversary Scientific Assembly and Annual Meeting  
Chicago, IL  
December 1-4, 1992

“MR Angiography: Current Status”

Refresher Course  
Radiological Society of North America  
78th Anniversary Scientific Assembly and Annual Meeting  
Chicago, IL  
December 1-4, 1992

1993

“Technical and Clinical Aspects of MR Angiography in Neurologic Disease”

The Complete MRI Course  
University of Pennsylvania  
Ritz-Carlton Hotel  
Maui, Hawaii  
January 4-8, 1993

“MR of Degenerative Spine Disease”

The Complete MRI Course  
University of Pennsylvania  
Ritz-Carlton Hotel  
Maui, Hawaii  
January 4-8, 1993

“Cranial Nerves and the Orbit”

The Complete MRI Course  
University of Pennsylvania  
Ritz-Carlton Hotel  
Maui, Hawaii  
January 4-8, 1993

“Fast MR Imaging of the CNS”

Delaware Valley MRI Society  
Thomas Jefferson University Hospital  
Philadelphia, PA  
January 14, 1993

“Vascular Malformations and Aneurysms: Current Imaging”

Neurosurgery Review Course  
National Center for Advanced Medical Education  
Chicago, IL  
February 8, 1993

“Imaging of Stroke and Intracranial Hemorrhage”

Neurosurgery Review Course  
National Center for Advanced Medical Education  
Chicago, IL  
February 8, 1993

“Principles and Clinical Practice in MRA of Neurologic Disease”

MRI at Snowmass  
Loyola University of Chicago School of Medicine  
Snowmass, Colorado  
February 21-26, 1993

“MR in Orbital and Ocular Motility Disorders”

MRI at Snowmass  
Loyola University of Chicago School of Medicine  
Snowmass, Colorado  
February 21-26, 1993

"MR of Intracranial Hemorrhage: Current Understanding"

MRI at Snowmass  
Loyola University of Chicago School of Medicine  
Snowmass, Colorado  
February 21-26, 1993

"Fast Imaging of the Brain and Spine"

MRI at Snowmass  
Loyola University of Chicago School of Medicine  
Snowmass, Colorado  
February 21-26, 1993

"Brain Tumors: Correlations of Pathology and MR"

MRI at Snowmass  
Loyola University of Chicago School of Medicine  
Snowmass, Colorado  
February 21-26, 1993

"MR Angiography in Neurologic Disease: Current Status"

Columbia-Presbyterian Medical Center  
Department of Radiology Noon Conference Lecture  
New York, New York  
March 22, 1993

"Understanding  $k$ -Space: Implications for Clinical Imaging"

1993 Annual Meeting of the Society for Magnetic Resonance Imaging  
San Francisco, California  
March 27-30, 1993

"Fast Imaging: Brain and Spine"

Educational Course  
1993 Annual Meeting of the Society for Magnetic Resonance Imaging  
San Francisco, California  
March 27-30, 1993

"Intraaxial Brain Tumors: Correlations of MR Imaging and Histopathology"

MRI Update 1993  
University of Pennsylvania  
Vail, Colorado  
March 29 - April 2, 1993

"Fast MR Imaging of the Brain and Spine"

MRI Update 1993  
University of Pennsylvania  
Vail, Colorado  
March 29 - April 2, 1993

"Intracranial Hemorrhage: Current Concepts"

MRI Update 1993  
University of Pennsylvania  
Vail, Colorado  
March 29 - April 2, 1993

"Intracranial MR Angiography"

MRI Update 1993  
University of Pennsylvania  
Vail, Colorado  
March 29 - April 2, 1993

"Intraaxial Brain Tumors: MR Imaging - Histopathology Correlations"

Guest Speaker  
1993 Annual Sao Paulo Radiological Society Meeting  
Sao Paulo, Brazil  
April 23-25, 1993

"Fast MR Imaging of the Brain and Spine: Principles and Applications"

Guest Speaker  
1993 Annual Sao Paulo Radiological Society Meeting  
Sao Paulo, Brazil  
April 23-25, 1993

"Imaging of Stroke and Intracranial Hemorrhage"

Guest Speaker  
1993 Annual Sao Paulo Radiological Society Meeting  
Sao Paulo, Brazil  
April 23-25, 1993

"MR Angiography in Neurologic Disease"

Guest Speaker  
1993 Annual Sao Paulo Radiological Society Meeting  
Sao Paulo, Brazil  
April 23-25, 1993

"Orbital and Ocular Motility Disorders: MR Imaging"

Guest Speaker  
1993 Annual Sao Paulo Radiological Society Meeting  
Sao Paulo, Brazil  
April 23-25, 1993

"Vascular Malformations and Aneurysms: Role of Imaging"

Guest Speaker  
1993 Annual Sao Paulo Radiological Society Meeting  
Sao Paulo, Brazil  
April 23-25, 1993



“Functional MR Imaging in Neuro-ophthalmology”

Invited Speaker

Contemporary and Controversial Issues in Neuroophthalmology

The Scheie Eye Institute and the University of Pennsylvania

Philadelphia, PA

October 2, 1993

“Brain Tumors - MRI-Pathology Correlations”

Grand Rounds

Visiting Professor

Department of Radiology

University of Wisconsin School of Medicine

Madison, WI

October 7, 1993

“Fast MR Imaging: Gradient Echo”

Invited Speaker

Contemporary MR Imaging Course

Edgewater Hotel

Department of Radiology

University of Wisconsin School of Medicine

Madison, WI

October 8, 1993

“Brain Hemorrhage”

Invited Speaker

Contemporary MR Imaging Course

Edgewater Hotel

Department of Radiology

University of Wisconsin School of Medicine

Madison, WI

October 8, 1993

“Brain Tumors - MRI-Pathology Correlations”

State of Wisconsin Radiologic Society Meeting

Madison, WI

October 9, 1993

“MRI of Intracranial Hemorrhage”

MR Update Course

University of Alabama-Birmingham School of Medicine

Hilton Head Island, SC

October 25-29, 1993

“Advances in MR Imaging of the Brain and Spine”

MR Update Course  
University of Alabama-Birmingham School of Medicine  
Hilton Head Island, SC  
October 25-29, 1993

“Orbital and Ocular Motility Disorders: MRI Contributions in Diagnosis”

MR Update Course  
University of Alabama-Birmingham School of Medicine  
Hilton Head Island, SC  
October 25-29, 1993

“Intracranial Vascular Malformations and Aneurysms: Role of MRI”

MR Update Course  
University of Alabama-Birmingham School of Medicine  
Hilton Head Island, SC  
October 25-29, 1993

“Neuroradiology Update: Stroke and Hemorrhage”

Refresher Course  
Radiological Society of North America  
79th Anniversary Scientific Assembly and Annual Meeting  
Chicago, IL  
November 29, 1993

“MR Angiography: Current Status”

Refresher Course  
Radiological Society of North America  
79th Anniversary Scientific Assembly and Annual Meeting  
Chicago, IL  
December 1, 1993

1994

“Brain Tumors - MRI-Pathology Correlations”

Visiting Professor  
Department of Radiology  
Northwestern University Medical Center  
Chicago, IL  
January 20, 1994

“MR Angiography in Neurological Disease: Current Status”

Guest Speaker  
Chicago Radiological Society Meeting  
Chicago, IL  
January 20, 1994

“MR Imaging of Intracranial Hemorrhage”

Annual Mid-Winter Meeting  
Educational Course  
Los Angeles Radiological Society  
Los Angeles, CA  
January 28-29, 1994

“Vascular Malformations and Aneurysms: Contemporary Imaging”

Annual Mid-Winter Meeting  
Educational Course  
Los Angeles Radiological Society  
Los Angeles, CA  
January 28-29, 1994

“MR Angiography in Neurological Disease”

Annual Mid-Winter Meeting  
Educational Course  
Los Angeles Radiological Society  
Los Angeles, CA  
January 28-29, 1994

“Imaging of the Eye and Orbit”

Annual Mid-Winter Meeting  
Educational Course  
Los Angeles Radiological Society  
Los Angeles, CA  
January 28-29, 1994

“Imaging of Vascular Malformations and Aneurysms”

Neurosurgery Review Course  
National Center for Advanced Medical Education  
Chicago, IL  
February 7, 1994

“Imaging of Stroke and Intracranial Hemorrhage”

Neurosurgery Review Course  
National Center for Advanced Medical Education  
Chicago, IL  
February 7, 1994

“MR Angiography in Neurological Disease: State of the Art”

ACR Regional Meeting  
Washington, D.C. Chapter  
Park Hyatt Hotel  
Washington, D.C.  
February 24, 1994

“MRI of Vascular Malformations and Aneurysms”  
“Principles and Practice of Clinical MRI”  
Johns Hopkins Medical Institution  
Baltimore, MD  
April 22, 1994

“MRI of Intracranial Hemorrhage”  
“Principles and Practice of Clinical MRI”  
Johns Hopkins Medical Institution  
Baltimore, MD  
April 22, 1994

“Fast MRI of the Brain and Spine”  
“Principles and Practice of Clinical MRI”  
Johns Hopkins Medical Institution  
Baltimore, MD  
April 22, 1994

“Imaging of Orbital Lesions and Oculomotor Dysmotility”  
“Principles and Practice of Clinical MRI”  
Johns Hopkins Medical Institution  
Baltimore, MD  
April 22, 1994

“MR Angiography in Neurological Disease: Current Status”  
Annual Meeting of the American Academy of Neurology  
“New MRI Techniques for Cerebrovascular Disease”  
Washington, D.C.  
May 6, 1994

“MRI of Vascular Malformations and Aneurysms”  
“Clinical MRI at Cape Fear”  
Cape Fear, NC  
June 17, 1994

“MR Angiography in Neurological Disease”  
“Clinical MRI at Cape Fear”  
Cape Fear, NC  
June 17, 1994

“Fast MR Imaging: Update”  
Annual Meeting of the Society of Magnetic Resonance  
Educational Course  
San Francisco, CA  
August 6, 1994

“MR Angiography in Neurological Disease: Current Status”

Annual International MRI Course  
Hospital ABC  
Mexico City, Mexico  
August 31-September 2, 1994

“MRI of Vascular Malformations and Aneurysms”

Annual International MRI Course  
Hospital ABC  
Mexico City, Mexico  
August 31-September 2, 1994

“Fast MR Imaging of the Brain: Update”

Annual International MRI Course  
Hospital ABC  
Mexico City, Mexico  
August 31-September 2, 1994

“MRI of Stroke”

Annual International MRI Course  
Hospital ABC  
Mexico City, Mexico  
August 31-September 2, 1994

“Brain Tumors: MRI-Pathology Correlations”

Annual International MRI Course  
Hospital ABC  
Mexico City, Mexico  
August 31-September 2, 1994

“Fast MR Imaging of the Brain: Update”

Visiting Professor  
Bowman Gray School of Medicine  
Winston-Salem, NC  
October 6, 1994

“Intracranial Vascular Malformations: State-of-the-Art”

Visiting Professor  
Bowman Gray School of Medicine  
Winston-Salem, NC  
October 7, 1994

“Fast MR Imaging of the Brain: Update”

Harvard Medical School  
Brigham and Women’s Hospital  
Annual MRI Course  
Boston, MA  
October 27, 1994

“Intracranial Vascular Malformations: State-of-the-Art”

Harvard Medical School  
Brigham and Women’s Hospital  
Annual MRI Course  
Boston, MA  
October 27, 1994

“CT and MRI of the Eye and Orbit”

Rush Presbyterian St. Luke’s Department of Radiology  
Annual Neuroradiology Course  
Chicago, IL  
October 28, 1994

“MR Angiography in Neurological Disease”

Rush Presbyterian St. Luke’s Department of Radiology  
Annual Neuroradiology Course  
Chicago, IL  
October 28, 1994

1995

“Functional MRI in Intracranial Mass Lesions”

MRI Into Its Second Decade  
MR ’95 International Symposium  
Garmisch, Germany  
January 26, 1995

“Imaging Stroke”

Neurosurgery Review Course  
National Center for Advanced Medical Education  
Chicago, IL  
February 11, 1995

“Imaging Intracranial Vascular Malformations and Aneurysms”

Neurosurgery Review Course  
National Center for Advanced Medical Education  
Chicago, IL  
February 11, 1995

“Cerebral MR Angiography”

1995 Distinguished Lecturer Series  
Department of Vascular Surgery  
Oregon Health Sciences University  
Portland, OR  
March 25, 1995

“Intracranial Hemorrhage”

American Society of Neuroradiology 1995 Annual Meeting  
Educational Course  
Chicago, IL  
April 21-28, 1995

“Advanced MRI in the CNS”

Neuroscience Grand Rounds  
Oregon Health Sciences University  
Portland, OR  
May 10, 1995

“MRA in Neurologic Disease”

XXV Brazilian Congress of Radiology  
Salvador-Bahia  
Brazil  
September 30 - October 4, 1995

“Imaging Vascular Malformations in the CNS”

XXV Brazilian Congress of Radiology  
Salvador-Bahia  
Brazil  
September 30 - October 4, 1995

“Stroke - Current Imaging”

XXV Brazilian Congress of Radiology  
Salvador-Bahia  
Brazil  
September 30 - October 4, 1995

“MRI of Intracranial Hemorrhage”

XXV Brazilian Congress of Radiology  
Salvador-Bahia  
Brazil  
September 30 - October 4, 1995



“Fast MRI of the CNS: Update”

XXV Brazilian Congress of Radiology  
Salvador-Bahia  
Brazil  
September 30 - October 4, 1995

“Imaging Orbital Disease”

XXV Brazilian Congress of Radiology  
Salvador-Bahia  
Brazil  
September 30 - October 4, 1995

“MRA in Neurologic Disease”

Royal Australasian College of Radiologists  
46th Annual General and Scientific Meeting  
Melbourne  
Australia  
October 21 - October 25, 1995

“Vascular Malformations of the CNS: Current Imaging”

Royal Australasian College of Radiologists  
46th Annual General and Scientific Meeting  
Melbourne  
Australia  
October 21 - October 25, 1995

“Fast MR Imaging of the Brain: Update”

Royal Australasian College of Radiologists  
46th Annual General and Scientific Meeting  
Melbourne  
Australia  
October 21 - October 25, 1995

“Imaging of Intracranial Vascular Malformations”

Refresher Course  
Radiological Society of North America  
81st Anniversary Scientific Assembly and Annual Meeting  
Chicago, IL  
November 27, 1995

“Advances in Neuro-Ophthalmologic Imaging”

An Update in Neuro-Ophthalmology in Honor of William F. Hoyt, M.D.  
UCSF School of Medicine  
Ritz-Carlton Hotel  
San Francisco, CA  
December 7-8, 1995

1996

“Imaging of Vascular Malformations and Aneurysms: Current Status”

Neurosurgery Review Course  
National Center for Advanced Medical Education  
Chicago, IL  
February 7, 1996

“Imaging of Stroke and Intracranial Hemorrhage: Update”

Neurosurgery Review Course  
National Center for Advanced Medical Education  
Chicago, IL  
February 7, 1996

“Imaging of Stroke: Update”

International Society of Magnetic Resonance in Medicine  
Annual Meeting and Scientific Assembly  
Educational Course in MRI  
New York, NY  
April 27, 1996

“Imaging of Stroke: Update”

Visiting Professor  
Department of Radiology  
University of North Carolina at Chapel Hill  
Chapel Hill, NC  
May 9, 1996

“MR Angiography in Neurologic Disease: Current Status”

Visiting Professor  
Department of Radiology  
University of North Carolina at Chapel Hill  
Chapel Hill, NC  
May 10, 1996

“MR Angiography in Neurological Disease: Current Status”

Annual International MRI Course  
Hospital ABC  
Mexico City, Mexico  
May 29-30, 1996

“Imaging of Intracranial Vascular Malformations”

Annual International MRI Course  
Hospital ABC  
Mexico City, Mexico  
May 29-30, 1996

“Fast MR Imaging of the Brain: Update”

Annual International MRI Course  
Hospital ABC  
Mexico City, Mexico  
May 29-30, 1996

“MRI of Stroke”

Annual International MRI Course  
Hospital ABC  
Mexico City, Mexico  
May 29-30, 1996

“Imaging Primary Brain Tumors: State-of-the-Art”

Annual Meeting of the American Society of Neuroradiology  
Educational Course  
Seattle, Washington  
June 21, 1996

“Imaging Intracranial Vascular Malformations”

The Florida Neuro and Body Imaging Course  
Orlando, Florida  
July 1-4, 1996

“Intracranial Infection and AIDS: Update”

The Florida Neuro and Body Imaging Course  
Orlando, Florida  
July 1-4, 1996

“Current Imaging of Stroke”

The Florida Neuro and Body Imaging Course  
Orlando, Florida  
July 1-4, 1996

“Imaging Primary Brain Tumors: State-of-the-Art”

The Florida Neuro and Body Imaging Course  
Orlando, Florida  
July 1-4, 1996

“Recent Advances in MRI of the Brain”

Malaysian Radiological Society Special Seminar  
Kuala Lumpur, Malaysia  
July 12, 1996

“Rationale and Clinical Indications for Contrast Agents in MRI of the Brain”

Malaysian Radiological Society Special Seminar  
Kuala Lumpur, Malaysia  
July 12, 1996

“Recent Advances in MRI of the Brain”

Singapore Radiological Society Special Seminar  
Raffles Hotel  
Singapore  
July 12, 1996

“Rationale and Clinical Indications for Contrast Agents in MRI of the Brain”

Singapore Radiological Society Special Seminar  
Raffles Hotel  
Singapore  
July 12, 1996

“Advances in MRI of the Brain”

Neurology Grand Rounds  
Mount Sinai School of Medicine  
New York, New York  
September 30, 1996

“Imaging Intracranial Vascular Malformations”

MRI of the Brain, Spine, and Head and Neck  
Mount Sinai School of Medicine  
Plaza Hotel  
New York, New York  
October 10-13, 1996

“Stroke and Intracranial Hemorrhage”

MRI of the Brain, Spine, and Head and Neck  
Mount Sinai School of Medicine  
Plaza Hotel  
New York, New York  
October 10-13, 1996

“MR Angiography: Current Status”

MRI of the Brain, Spine, and Head and Neck  
Mount Sinai School of Medicine  
Plaza Hotel  
New York, New York  
October 10-13, 1996

“Orbit and Disease of the Eye”

MRI of the Brain, Spine, and Head and Neck  
Mount Sinai School of Medicine  
Plaza Hotel  
New York, New York  
October 10-13, 1996

“Advanced MRI Techniques”

MRI of the Brain, Spine, and Head and Neck  
Mount Sinai School of Medicine  
Plaza Hotel  
New York, New York  
October 10-13, 1996

“Imaging Aneurysms and Subarachnoid Hemorrhage”

Brigham and Women’s Hospital  
Harvard Medical School  
Magnetic Resonance Imaging and Computed Tomography Update: 1996  
Boston, Massachusetts  
October 23, 1996

“Intracranial Vascular Malformations”

Brigham and Women’s Hospital  
Harvard Medical School  
Magnetic Resonance Imaging and Computed Tomography Update: 1996  
Boston, Massachusetts  
October 23, 1996

“Functional Brain Imaging”

Speaker, Session Chair, and Scientific Committee Member  
MRI Contrast Media: New Developments and Trends  
Bracco, International  
Barcelona, Spain  
November 15-17, 1996

“Advances in MRI of the Brain”

Visiting Professor  
Radiology Grand Rounds  
New York Hospital  
Cornell University School of Medicine  
New York, New York  
November 7, 1996

“Imaging Brain Tumors: Principles and Correlations with Pathology”

NYU School of Medicine Department of Radiology  
CT/MRI Head to Toe Course  
Grand Hyatt Hotel  
New York, New York  
December 18, 1996

1997

“Imaging Brain Tumors: Principles and Correlations with Pathology”  
“Problem Solving in Brain, Spine, and Head and Neck Imaging”  
Mount Sinai School of Medicine Course  
Amelia Island, Florida  
April 16-20, 1997

“Fast MR Imaging of the Brain: Update”  
“Problem Solving in Brain, Spine, and Head and Neck Imaging”  
Mount Sinai School of Medicine Course  
Amelia Island, Florida  
April 16-20, 1997

“Imaging Intracranial Vascular Malformations”  
“Problem Solving in Brain, Spine, and Head and Neck Imaging”  
Mount Sinai School of Medicine Course  
Amelia Island, Florida  
April 16-20, 1997

“Imaging of Stroke: State of the Art”  
“Problem Solving in Brain, Spine, and Head and Neck Imaging”  
Mount Sinai School of Medicine Course  
Amelia Island, Florida  
April 16-20, 1997

“Imaging Orbital Disease”  
“Problem Solving in Brain, Spine, and Head and Neck Imaging”  
Mount Sinai School of Medicine Course  
Amelia Island, Florida  
April 16-20, 1997

“Imaging Orbital Disease”  
Invited Speaker  
ACR - Washington D.C. Chapter  
April 24, 1997  
Washington, D.C.

“Functional MR Imaging of the Brain”  
Annual Spring Meeting  
New York Roentgen Society  
New York, New York  
April 30-May 2, 1997

“Imaging of Acute Stroke: Current Status”  
Treatment and Prevention of Cerebral Infarction  
Mount Sinai School of Medicine  
New York, New York  
May 8, 1997

“Recent Advances in MRI of the Brain”  
Radiology Grand Rounds  
Stanford University School of Medicine  
Palo Alto, California  
August 28, 1997

“Intracranial Vascular Malformations”  
“MRI of the Brain, Spine, and Head and Neck”  
Mount Sinai School of Medicine  
Plaza Hotel  
New York, New York  
September 10-13, 1997

“Stroke and Intracranial Hemorrhage”  
“MRI of the Brain, Spine, and Head and Neck”  
Mount Sinai School of Medicine  
Plaza Hotel  
New York, New York  
September 10-13, 1997

“Imaging of the Orbit”  
“MRI of the Brain, Spine, and Head and Neck”  
Mount Sinai School of Medicine  
Plaza Hotel  
New York, New York  
September 10-13, 1997

1998

“Advances in MRI of the Brain”  
1998 Annual Meeting  
Mexican Society of Radiology and Imaging  
Mexico City, Mexico  
February 4, 1998

“Imaging of Acute Stroke: Current Status”  
1998 Annual Meeting  
Mexican Society of Radiology and Imaging  
Mexico City, Mexico  
February 4, 1998



“Intracranial Vascular Malformations”

1998 Annual Meeting  
Mexican Society of Radiology and Imaging  
Mexico City, Mexico  
February 4, 1998

“Brain Tumors: MRI-Pathology Correlations”

1998 Annual Meeting  
Mexican Society of Radiology and Imaging  
Mexico City, Mexico  
February 4, 1998

“Imaging of the Orbit”

MRI of the Brain, Spine, Head and Neck - Update  
Mount Sinai School of Medicine  
San Juan, Puerto Rico  
February 19, 1998

“Advances in MRI of the Brain”

MRI of the Brain, Spine, Head and Neck - Update  
Mount Sinai School of Medicine  
San Juan, Puerto Rico  
February 19, 1998

“Imaging of Acute Stroke: Current Status”

MRI of the Brain, Spine, Head and Neck - Update  
Mount Sinai School of Medicine  
San Juan, Puerto Rico  
February 19, 1998

“Intracranial Vascular Malformations”

MRI of the Brain, Spine, Head and Neck - Update  
Mount Sinai School of Medicine  
San Juan, Puerto Rico  
February 19, 1998

“Brain Tumors: MRI-Pathology Correlations”

MRI of the Brain, Spine, Head and Neck - Update  
Mount Sinai School of Medicine  
San Juan, Puerto Rico  
February 19, 1998

“Advances in MRI of the Brain”

Visiting Professor, Radiology Grand Rounds  
Columbia University School of Medicine  
New York, New York  
March 11, 1998

“Hot Topics: Diffusion and Perfusion Imaging”

1998 Annual Meeting  
International Society of Magnetic Resonance in Medicine  
Sydney, Australia  
April 17-23, 1998

“Brain Tumors: MRI-Pathology Correlations”

Visiting Professor  
University of Virginia School of Medicine  
Charlottesville, Virginia  
September 10, 1998

“Advances in MRI of the Brain”

Visiting Professor  
Radiology Grand Rounds  
University of Virginia School of Medicine  
Charlottesville, Virginia  
September 10, 1998

“Neuroradiology Unknown Case Conference”

Visiting Professor  
University of Virginia School of Medicine  
Charlottesville, Virginia  
September 11, 1998

“MRI of Primary Brain Tumors”

Visiting Professor  
MD Anderson Medical Center  
Houston, Texas  
September 28, 1998

“Imaging of the Eye and Orbit”

Visiting Professor  
University of Texas - Houston Medical Center  
Houston, Texas  
September 28, 1998

“Recent Advances in MRI of the Brain”

The Doubleday Lecture  
Houston Radiological Society and MD Anderson Medical Center  
Houston, Texas  
September 28, 1998

“Imaging Stroke”

“MRI of the Brain, Spine, and Head and Neck”

Mount Sinai School of Medicine

Plaza Hotel

New York, New York

October 14-15, 1998

“Intracranial Hemorrhage: Principles and Clinical Applications”

“MRI of the Brain, Spine, and Head and Neck”

Mount Sinai School of Medicine

Plaza Hotel

New York, New York

October 14-15, 1998

“MRI of Primary Brain Tumors: Correlations to Histopathology”

“MRI of the Brain, Spine, and Head and Neck”

Mount Sinai School of Medicine

Plaza Hotel

New York, New York

October 14-15, 1998

“Recent Advances in MRI of the Brain”

“MRI of the Brain, Spine, and Head and Neck”

Mount Sinai School of Medicine

Plaza Hotel

New York, New York

October 14-15, 1998

“Recent Advances in MRI of the Brain”

“Current Concepts in Magnetic Resonance”

Department of Radiology and the Lucas MR Center

Stanford University School of Medicine

Monterey Plaza Hotel

Monterey, California

November 2-5, 1998

“MRI Advances for the Diagnosis of Neurologic Disorders”

“Advances in Neuroscience”

Stanford Neurology Department

Stanford University School of Medicine

Hotel Sofitel

Redwood City, California

November 20, 1998

1999

“Recent Advances in MRI of the Brain”

San Francisco Neurological Society Annual Meeting  
Seascape Resort  
Monterey, California  
March 5, 1999

“Diffusion Tensor MR: Potential Clinical Applications”

General Electric Medical Systems  
MR Advisory Board  
Chicago, Illinois  
March 17-18, 1999

“Diffusion – Perfusion MRI of the Brain”

Educational Program: Neuroimaging Session  
Introductory MRI: Techniques and Clinical Applications  
1999 Annual Meeting  
International Society of Magnetic Resonance in Medicine  
Philadelphia, Pennsylvania  
May 22, 1999

“Hot Topics: Diffusion and Perfusion Imaging”

1999 Annual Meeting  
International Society of Magnetic Resonance in Medicine  
Philadelphia, Pennsylvania  
May 23-27, 1999

“Advanced MRI in Brain Tumors”

4<sup>TH</sup> NICER HORIZON “Functional Imaging” Meeting  
International Society of Magnetic Resonance in Medicine  
Oslo, Norway  
June 11-13, 1999

“Advanced MRI in Aging and Degenerative Disorders of the Brain”

4<sup>TH</sup> NICER HORIZON “Functional Imaging” Meeting  
International Society of Magnetic Resonance in Medicine  
Oslo, Norway  
June 11-13, 1999

“Advanced MRI in Cerebrovascular Disease”

4<sup>TH</sup> NICER HORIZON “Functional Imaging” Meeting  
International Society of Magnetic Resonance in Medicine  
Oslo, Norway  
June 11-13, 1999

“Advanced MRI in Epilepsy”

4<sup>TH</sup> NICER HORIZON “Functional Imaging” Meeting  
International Society of Magnetic Resonance in Medicine  
Oslo, Norway  
June 11-13, 1999

“Recent Advances in MRI of the Brain”

1999 Annual Meeting  
International Seoul Radiology Symposium  
Seoul, Korea  
September 11-12, 1999

“Stroke Imaging: Current Clinical Practice”

1999 Annual Meeting  
International Seoul Radiology Symposium  
Seoul, Korea  
September 11-12, 1999

“MRI of Stroke and Hemorrhage”

1999 UCSF MRI Course  
San Francisco, California  
October 8, 1999

“Brain Tumors: MRI – Pathology Correlations”

1999 UCSF MRI Course  
San Francisco, California  
October 8, 1999

“Recent Advances in MRI of the Brain”

South Bay Radiology Society  
San Francisco, California  
October 19, 1999

“MRI of Intracranial Hemorrhage”

“Current Concepts in Magnetic Resonance”  
Department of Radiology and the Lucas MR Center  
Stanford University School of Medicine  
Monterey Plaza Hotel  
Monterey, California  
November , 1999

“Recent Advances in MRI of the Brain”

“Current Concepts in Magnetic Resonance”  
Department of Radiology and the Lucas MR Center  
Stanford University School of Medicine  
Monterey, California  
November 15, 1999

2000

“Brain Tumors: Principles and Clinical Applications”

International Neuroradiology Course

Davos, Switzerland

March 25-30, 2000

“Advanced Neuro MR Course”

ISMRM 2000 Annual Meeting

Course Director and Moderator

Denver, Colorado

April 2, 2000

“MR of Brain Tumors: Principles and Applications”

MR for the Millenium: “Neuro and Musculoskeletal MR”

Stanford University School of Medicine

Department of Radiology

Argent Hotel

San Francisco, California

June 18-20, 2000

“MR of Intracranial Hemorrhage: Current Status”

MR for the Millenium: “Neuro and Musculoskeletal MR”

Stanford University School of Medicine

Department of Radiology

Argent Hotel

San Francisco, California

June 18-20, 2000

“MRI of Intracranial Hemorrhage”

“Current Concepts in Magnetic Resonance”

Department of Radiology and the Lucas MR Center

Stanford University School of Medicine

Monterey Plaza Hotel

Monterey, California

September 24, 2000

“Recent Advances in MRI of the Brain”

“Current Concepts in Magnetic Resonance”

Department of Radiology and the Lucas MR Center

Stanford University School of Medicine

Monterey Plaza Hotel

Monterey, California

September 28, 2000

2001

“Quantitative Diffusion MR in Multiple Sclerosis”  
International Symposium in MR Research  
Garmisch, Germany  
January 25, 2001

“Regional and Global Diffusion MR in Normal Aging”  
International Symposium in MR Research  
Garmisch, Germany  
January 25, 2001

“MR of Intracranial Hemorrhage: Current Status”  
“Neuro and Musculoskeletal MR”  
Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
February 15-16, 2001

“Stroke Imaging: Current Status”  
“Neuro and Musculoskeletal MR”  
Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
February 15-16, 2001

“Brain Tumors: Fundamentals of MR”  
“Neuro and Musculoskeletal MR”  
Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
February 15-16, 2001

*Course Director*

“Neuro and Musculoskeletal MR”  
Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
February 15-16, 2001

*Course Director and Moderator*

“Neuro MR Course”  
ISMRM 2001 Annual Meeting  
April 21-22, 2001



“MR of Intracranial Hemorrhage: Update”

Neuro MR Course  
ISMRM 2001 Annual Meeting  
April 22, 2001

“Advances in Brain MRI”

Visiting Professor  
University of Cambridge  
Cambridge, England  
April 23, 2001

“MRI of Blood and Intracranial Hemorrhage”

“Current Concepts of Magnetic Resonance”  
Department of Radiology and the Lucas MR Center  
Stanford University School of Medicine  
Monterey Plaza Hotel  
Monterey, California  
October 14, 2001

“Advanced Neuro MR Applications”

“Current Concepts of Magnetic Resonance”  
Department of Radiology and the Lucas MR Center  
Stanford University School of Medicine  
Monterey Plaza Hotel  
Monterey, California  
October 18, 2001

“Effects of Managed Care on Advances in Technology-Based Medicine”

Invited Speaker  
Hoover Institution  
Health Care Policy Seminars  
December 6, 2001

2002

“Managed Care, New Medical Technologies, and Public Policy”

Guest Speaker  
Hoover Institution  
Lunch Seminars  
January 31, 2002

“MR of Intracranial Hemorrhage: Current Status”

“Advances in Neuro MR and Sports Medicine”  
Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
February 21-22, 2002

“Stroke Imaging: Current Status”

Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
February 21-22, 2002

“Imaging Brain Tumors: Fundamentals and Recent Advances”

Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
February 21-22, 2002

“Stroke Imaging: Current Status”

Visiting Professor  
Department of Radiology  
Cleveland Clinic Foundation  
Cleveland, Ohio  
March 11, 2002

“Imaging Brain Tumors: Fundamentals and Recent Advances”

Visiting Professor  
Department of Radiology  
Cleveland Clinic Foundation  
Cleveland, Ohio  
March 11, 2002

“MR of Intracranial Hemorrhage: Current Status”

Department of Radiology  
Stanford University School of Medicine  
Mauna Lani Hotel  
Maui, Hawaii  
April 14-18, 2002

“Stroke Imaging: Current Status”

Department of Radiology  
Stanford University School of Medicine  
Mauna Lani Hotel  
Maui, Hawaii  
April 14-18, 2002

“Imaging Brain Tumors: Fundamentals and Recent Advances”

Department of Radiology  
Stanford University School of Medicine  
Mauna Lani Hotel  
Maui, Hawaii  
April 14-18, 2002

“Recent Advances in Brain MRI”

Department of Radiology  
Stanford University School of Medicine  
Mauna Lani Hotel  
Maui, Hawaii  
April 14-18, 2002

“Neurologic Applications of High Field MRI”

Department of Radiology  
Stanford University School of Medicine  
Four Seasons Hotel  
Las Vegas, Nevada  
September 27, 28, 2002

“Stroke: Current MRI Status”

Annual Meeting of MRI Advances  
Taiwan Radiological Society  
Taipei, Taiwan  
October 3-4, 2002

“Imaging Brain Tumors: Recent Advances”

Annual Meeting of MRI Advances  
Taiwan Radiological Society  
Taipei, Taiwan  
October 3-4, 2002

“Managed Care, New Medical Technologies, and Public Policy”

Invited Speaker  
Hoover Institution  
Fall Retreat Seminars  
November 11, 2002

2003

“Stroke Imaging: Current Status”

Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
February 27-28, 2003

“Imaging Hemorrhage: Current Concepts”

Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
February 27-28, 2003

“Imaging Brain Tumors: Fundamentals and Recent Advances”

Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
February 27-28, 2003

“Health Care: Time for Fundamental Change”

Invited Speaker  
Hoover Institution  
Spring Retreat Seminars  
April 28, 2003

“Ultrahigh Field MRI in Neuroimaging: Current Status and Potential”

Speaker and Co-Director  
Stanford University Medical Center  
Four Seasons Hotel  
Las Vegas, Nevada  
September 13, 14, 2003

“MRI of Intracranial Hemorrhage”

“Current Concepts of Magnetic Resonance”  
Department of Radiology and the Lucas MR Center  
Stanford University School of Medicine  
Monterey Plaza Hotel  
Monterey, California  
October 30, 2003

“Advanced Neuro MR Applications”

“Current Concepts of Magnetic Resonance”  
Department of Radiology and the Lucas MR Center  
Stanford University School of Medicine  
Monterey Plaza Hotel  
Monterey, California  
October 30, 2003

“MRI of Stroke: Current Concepts”

NYU CT/MRI: Head to Toe  
Department of Radiology  
Grand Hyatt Hotel  
New York, New York  
December 15-20, 2003

“MRI of Brain Tumors: From Fundamentals to Advances”

NYU CT/MRI: Head to Toe  
Department of Radiology  
Grand Hyatt Hotel  
New York, New York  
December 15-20, 2003

2004

“Stroke Imaging: Current Status”

Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
February 27-28, 2004

“Imaging Hemorrhage: Update”

Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
February 27-28, 2004

“Imaging Brain Tumors: Fundamentals and Recent Advances”

Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
February 27-28, 2004

“Stroke Imaging: Current State-of-the-Art”

Department of Radiology  
Stanford University School of Medicine  
Fairmont Hotel  
Maui, Hawaii  
March 10-16, 2004

“MRI of Intracranial Hemorrhage: Current Concepts”

Department of Radiology  
Stanford University School of Medicine  
Fairmont Hotel  
Maui, Hawaii  
March 10-16, 2004

“Imaging Brain Tumors: Fundamentals and Pathology Correlations”

Department of Radiology  
Stanford University School of Medicine  
Fairmont Hotel  
Maui, Hawaii  
March 10-16, 2004

“Recent Advances in Brain MRI”

Department of Radiology  
Stanford University School of Medicine  
Fairmont Hotel  
Maui, Hawaii  
March 10-16, 2004

“Non-Traumatic Emergency Imaging of the Brain”

Imaging of the Brain, Spine, Head and Neck International Neuroradiology Symposium  
Davos, Switzerland  
March 26-April 2, 2004

“Stroke Imaging: Current State-of-the-Art”

Annual Meeting and Scientific Assembly  
Jornado de Paulista Radiologica  
Sao Paulo, Brazil  
April 21-24, 2004

“MRI of Intracranial Hemorrhage: Current Concepts”

Annual Meeting and Scientific Assembly  
Jornado de Paulista Radiologica  
Sao Paulo, Brazil  
April 21-24, 2004

“Imaging Brain Tumors: Fundamentals and Pathology Correlations”

Annual Meeting and Scientific Assembly  
Jornado de Paulista Radiologica  
Sao Paulo, Brazil  
April 21-24, 2004

“Recent Advances in Brain MRI”

Annual Meeting and Scientific Assembly  
Jornado de Paulista Radiologica  
Sao Paulo, Brazil  
April 21-24, 2004

“Imaging Brain Tumors: Fundamentals and Pathology Correlations”

International Imaging Course 2004  
Chinese University of Hong Kong  
Hong Kong, China  
September 4-6, 2004

“Stroke Imaging: Current Status”

International Imaging Course 2004  
Chinese University of Hong Kong  
Hong Kong, China  
September 4-6, 2004

“Imaging Intracranial Hemorrhage: Update”

International Imaging Course 2004  
Chinese University of Hong Kong  
Hong Kong, China  
September 4-6, 2004

“Recent Advances in Brain MRI”

International Imaging Course 2004  
Chinese University of Hong Kong  
Hong Kong, China  
September 4-6, 2004

“Stroke Imaging: Current Status”

Colorado Radiological Society Honorary Speaker  
Loews Denver Hotel  
Denver, Colorado  
September 16, 2004

“Recent Advances in Brain MRI”

Colorado Radiological Society Honorary Speaker  
Loews Denver Hotel  
Denver, Colorado  
September 16, 2004

“Stroke Imaging: Current State-of-the-Art”

50<sup>th</sup> Annual Meeting of the Argentine Congress of Radiology  
Society of Argentina Radiology  
Buenos Aires, Argentina  
September 22-24, 2004



“MRI of Intracranial Vascular Malformations”

50<sup>th</sup> Annual Meeting of the Argentine Congress of Radiology  
Society of Argentina Radiology  
Buenos Aires, Argentina  
September 22-24, 2004

“Imaging of Orbital and Ocular Disease”

50<sup>th</sup> Annual Meeting of the Argentine Congress of Radiology  
Society of Argentina Radiology  
Buenos Aires, Argentina  
September 22-24, 2004

“Imaging Brain Tumors: Fundamentals and Pathology Correlations”

50<sup>th</sup> Annual Meeting of the Argentine Congress of Radiology  
Society of Argentina Radiology  
Buenos Aires, Argentina  
September 22-24, 2004

“Recent Advances in Brain MRI”

50<sup>th</sup> Annual Meeting of the Argentine Congress of Radiology  
Society of Argentina Radiology  
Buenos Aires, Argentina  
September 22-24, 2004

“High Field MR in Neurologic Disease: Rationale and Significance”

3<sup>rd</sup> Annual Clinical Applications in High Field MR Imaging  
Bellagio Hotel  
Stanford University School of Medicine  
Las Vegas, Nevada  
October 17, 2004

“Stroke Imaging: Current State-of-the-Art”

XXXIII Brazilian Congress of Radiology  
Rio de Janeiro, Brazil  
November 12-14, 2004

“MRI of Intracranial Vascular Malformations”

XXXIII Brazilian Congress of Radiology  
Rio de Janeiro, Brazil  
November 12-14, 2004

“Imaging of Orbital and Ocular Disease”

XXXIII Brazilian Congress of Radiology  
Rio de Janeiro, Brazil  
November 12-14, 2004

“Imaging Brain Tumors: Fundamentals and Pathology Correlations”  
XXXIII Brazilian Congress of Radiology  
Rio de Janeiro, Brazil  
November 12-14, 2004

“MRI of Intracranial Hemorrhage: Update”  
XXXIII Brazilian Congress of Radiology  
Rio de Janeiro, Brazil  
November 12-14, 2004

2005

“Advances in MRI of the Brain: High Field MRI”  
Inaugural Dedication Ceremony  
3T MRI Center  
Jinan, China  
January 22, 2005

“Imaging Stroke: Update”  
Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
March 3-4, 2005

“Recent Advances in MR of the Brain”  
Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
March 3-4, 2005

“Imaging of the Orbit”  
Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
March 3-4, 2005

Special Symposium: MultiHance, A New Contrast Agent in Neuro MR  
Moderator, Panel Discussion  
Bracco International  
Green Valley Resort  
Las Vegas, Nevada  
April 11, 2005

“Health Care in the US: What is the Role of Government?”  
Stanford University General Counsel Annual Retreat  
Stanford University  
Wallenberg Auditorium  
September 23, 2005

“MRI of Intracranial Hemorrhage”  
“Current Concepts of Magnetic Resonance”  
Department of Radiology and the Lucas MR Center  
Stanford University School of Medicine  
Monterey Plaza Hotel  
Monterey, California  
October 20, 2005

“Advanced Neuro MR Applications”  
“Current Concepts of Magnetic Resonance”  
Department of Radiology and the Lucas MR Center  
Stanford University School of Medicine  
Monterey Plaza Hotel  
Monterey, California  
October 20, 2005

“High Field MR in Neurologic Disease: Rationale and Significance”  
4<sup>th</sup> Annual Clinical Applications in High Field MR Imaging  
Wynn Resort and Hotel  
Stanford University School of Medicine  
Las Vegas, Nevada  
October 24, 2005

## 2006

“Advances in Neuro MRI”  
Arab World Health  
6<sup>th</sup> Middle East Imaging and Diagnostic Conference Annual Meeting  
Dubai, UAE  
January 23-25, 2006

“Imaging Stroke: Current Status”  
Arab World Health  
6<sup>th</sup> Middle East Imaging and Diagnostic Conference Annual Meeting  
Dubai, UAE  
January 23-25, 2006

“Advances in Imaging Multiple Sclerosis and White Matter Disease”  
1<sup>st</sup> Annual Emirates Congress of Neurology  
Dubai, UAE  
March 7, 2006

“Imaging Stroke: Current Status”

1<sup>st</sup> Annual Emirates Congress of Neurology  
Dubai, UAE  
March 7, 2006

“Imaging Stroke: Update”

Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
March 9, 2006

“Recent Advances in MR of the Brain”

Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
March 9, 2006

“Imaging Intracerebral Hemorrhage”

Sessao Medico Inaugural do CID Leblon  
Centro Integrado de Diagnostico Leblon  
Rio de Janeiro, Brazil  
April 7, 2006

“Imaging Ischemic Stroke in the Adult”

Sessao Medico Inaugural do CID Leblon  
Centro Integrado de Diagnostico Leblon  
Rio de Janeiro, Brazil  
April 7, 2006

“Imaging Stroke: Update”

60<sup>th</sup> Annual Meeting  
Pacific Northwest Radiological Society  
Fairmont Waterfront Hotel  
Vancouver, Canada  
April 29, 2006

“Imaging Brain Tumors: Fundamentals and Advances”

60<sup>th</sup> Annual Meeting  
Pacific Northwest Radiological Society  
Fairmont Waterfront Hotel  
Vancouver, Canada  
April 29, 2006

“Stroke Imaging: Update and Clinical Perspective”

Annual Brazilian Congress of Radiology  
Curitiba, Brazil  
October 11, 2006

“Imaging Brain Tumors: Fundamental Approach and Advances”

Annual Brazilian Congress of Radiology  
Curitiba, Brazil  
October 11, 2006

“Adult White Matter Disease: Current Status of Imaging”

Annual Brazilian Congress of Radiology  
Curitiba, Brazil  
October 11, 2006

“Advances in MR Technology: Rationale and Significance”

5<sup>th</sup> Annual Clinical Applications in High Field MR Imaging  
Wynn Resort and Hotel  
Stanford University School of Medicine  
Las Vegas, Nevada  
October 15, 2006

“Stroke Imaging: Fundamentals and Advances”

Ninth Annual Conference of the Indian Society of Neuroradiology  
Guwahati, India  
November 17-19, 2006

“Imaging Brain Tumors: Current Status”

Ninth Annual Conference of the Indian Society of Neuroradiology  
Guwahati, India  
November 17-19, 2006

“Acquired White Matter Disease: The Role of Imaging”

Ninth Annual Conference of the Indian Society of Neuroradiology  
Guwahati, India  
November 17-19, 2006

2007

“Technology Advances and the Future of Neuroimaging”

Shaping the Future of Radiology: International Symposium  
Bracco International  
Milan, Italy  
February 9, 2007

“Imaging Stroke: Update”

Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
March 15-16, 2007

“Recent Advances in MR of the Brain”

Department of Radiology  
Stanford University School of Medicine  
Bellagio Hotel  
Las Vegas, Nevada  
March 15-16, 2007

“Neuro MRI at 3T”

2007 Summer Symposium on State-of-the-Art Imaging  
Stanford Radiology in partnership with the Japanese Society of Radiological Technology  
Stanford University School of Medicine  
Stanford, California  
July 24, 2007

“Advances in MR Technology: Rationale and Significance”

6<sup>th</sup> Annual Clinical Applications in High Field MR Imaging  
Wynn Resort and Hotel  
Stanford University School of Medicine  
Las Vegas, Nevada  
October 14, 2007

“Stroke Imaging: What Is, and What Might Be”

Italian Society of Neuroradiology Annual Course and Meeting  
University of Bologna School of Medicine  
Bologna, Italy  
November 2, 2007

“Stroke Imaging: Current Status”

India Society of Neuroradiology 10<sup>th</sup> Annual Conference  
Mumbai, India  
November 13-15, 2007

“Imaging Brain Tumors: Fundamentals and Advances”

India Society of Neuroradiology 10<sup>th</sup> Annual Conference  
Mumbai, India  
November 13-15, 2007

“Imaging Diseases of the Eye and Orbit”

India Society of Neuroradiology 10<sup>th</sup> Annual Conference  
Mumbai, India  
November 13-15, 2007

“Advances in Imaging Technology: What Are The Drivers?”

India Society of Neuroradiology 10<sup>th</sup> Annual Conference  
Mumbai, India  
November 13-15, 2007

“Advances in MRI”

Special Seminar  
Lucid Advanced Medical Diagnostics  
ITC Grand Kakatiya  
Hyderabad, India  
November 16, 2007

“Key Health Care Trends in Asian Emerging Markets”

Invited Panel Discussant  
GE Healthcare Asian Pacific American Forum  
2007 Radiological Society of North American Scientific Assembly and Annual Meeting  
Chicago, Illinois  
November 26, 2007

“The Future of Health Care in America”

Hoover Institution Fall Retreat  
Hoover Institution  
Stanford University  
Stanford, California  
November 30, 2007

2008

“Advances in MRI: Rationale and Future Directions”

General Electric Healthcare  
Advanced Users Group  
Sao Paulo, Brazil  
February 26, 2008

“Key Trends in Health Care in Asia: Implications for China”

Special Seminar  
Peking University School of Business  
Peking University  
April 21, 2008

“MRI in Brain Tumors: Update”

Department of Radiology  
Stanford University School of Medicine  
Wynn Resort  
Las Vegas, Nevada  
May 1-2, 2008

“Emerging Advances in MR of the Brain”

Department of Radiology  
Stanford University School of Medicine  
Wynn Resort  
Las Vegas, Nevada  
May 1-2, 2008

“Current Imaging of Stroke: What is True and What Might Be”

VI Simposio de Neurociencias FLENI 2008  
Buenos Aires, Argentina  
May 14, 2008

“Current MRI of Brain Tumors: Fundamentals and Advanced Applications”

VI Simposio de Neurociencias FLENI 2008  
Buenos Aires, Argentina  
May 14, 2008

“The Future of MRI: Rationale and Emerging Applications”

VI Simposio de Neurociencias FLENI 2008  
Buenos Aires, Argentina  
May 14, 2008

“Advances in Brain MRI: Evolution of Technology and Emerging Applications”

First Annual Symposium on Advanced MRI  
Fudan University School of Medicine  
Shanghai, China  
June 21, 2008

“Health Care in Emerging China: Trends and Challenges”

Bing Overseas Seminar Program  
Stanford University, in collaboration with Renmin University  
Renmin University  
Beijing, China  
September 5, 2008

“Advances in Brain MRI: Evolution of Technology and Emerging Applications”

Guest Lecturer, Department of Psychology  
University of Illinois  
Champaign-Urbana, Illinois  
October 10, 2008



“Advances in High Field MR Technology: Rationale and Significance”

7<sup>th</sup> Annual “Clinical Applications in High Field MR Imaging”

Bellagio Resort and Hotel

Stanford University School of Medicine

Las Vegas, Nevada

October 18, 2008

“Doctors in Public Advocacy”

Invited Panel Member

First Year School of Medicine Class

Stanford University School of Medicine

October 20, 2008

“Imaging Brain Tumors: Current Status”

Invited Overseas Faculty Member

8<sup>th</sup> Advanced Neuroradiology Course

National Neuroscience Institute

Singapore

November 13-14, 2008

“Advances in Brain Imaging: High Field and Beyond”

Invited Overseas Faculty Member

8<sup>th</sup> Advanced Neuroradiology Course

National Neuroscience Institute

Singapore

November 13-14, 2008

“New Advances in High Field Brain MR: Significance and Emerging Applications”

Invited Speaker, GE Healthcare: Russia Symposium

Ritz Carlton Hotel

Moscow, Russia

November 19, 2008

“New Advances in High Field Brain MR: Significance and Emerging Applications”

Invited Speaker, Special Radiology Conference

Medem Clinic

St. Petersburg, Russia

November 20, 2008

“Health Issues in Asia: Health Care Access in Rural Asia, and Medical Tourism”

Invited Panel Discussant, GE Healthcare Asian Pacific American Forum

2008 Radiological Society of North American Scientific Assembly and Annual Meeting

Chicago, Illinois

December 2, 2008

“Current and Emerging Uses of MRI”

Guest Speaker  
RDO Diagnostic Clinic  
Sao Paulo, Brazil  
December 13, 2008

2009

“Advances in Brain MR: High Field and Beyond”

Visiting Professor  
Peking Union Medical College  
Beijing, China  
January 7, 2009

“Advances in MRI of the Brain: Emerging Applications”

Invited Speaker  
Nevskiy Annual Radiology Forum  
St. Petersburg, Russia  
April 7, 2009

“Advances in Brain MR: High Field and Beyond”

Invited Speaker  
GE Healthcare CT and MR Customer Summit  
Hyderabad, India  
April 18-19, 2009

“Stroke Imaging”

Invited Speaker  
GE Healthcare CT and MR Customer Summit  
Hyderabad, India  
April 18-19, 2009

“Advances in Brain MR: Emerging Applications”

Special Seminar  
Teleradiology Solutions Educational Center  
Bangalore, India  
April 20, 2009

“Advances in High Field Brain MR”

Invited Speaker  
Jornado de Paulista Radiologia Annual Meeting  
Sao Paulo, Brazil  
April 29, 2009

“Neuroradiology Board Review”

Visiting Professor  
University of Kansas Medical Center  
Kansas City, Missouri  
May 13, 2009

“Emerging Advances in Brain MRI”

Invited Speaker  
University of Kansas and Kansas City Radiological Society  
Kansas City, Missouri  
May 13, 2009

“US Healthcare Reform: Issues, Facts, and Policy Alternatives”

First Annual J. Arliss Pollock, MD Memorial Lecture 2009  
American Society of Neuroradiology Annual Scientific Meeting  
Vancouver, Canada  
May 19, 2009

“Advances in Brain MRI: 3T and Beyond”

Anniversary Neuroscience Symposium  
FLENI Neurological Institute  
Buenos Aires, Argentina  
September 10, 2009

“Stroke Imaging: Current Status”

Anniversary Neuroscience Symposium  
FLENI Neurological Institute  
Buenos Aires, Argentina  
September 10, 2009

“Imaging Brain Tumors: Fundamentals and Advances”

Anniversary Neuroscience Symposium  
FLENI Neurological Institute  
Buenos Aires, Argentina  
September 10, 2009

“Advances in Brain MRI: 3T and Beyond”

XII Jornada Pernambucana de Radiologia  
And XIX Curso de Diagnóstico por Imagem da Mama  
Sociedade de Radiologia de Pernambuco  
Recife, Brazil  
September 12, 2009

“Stroke Imaging: What is True and What Might Be True”

XII Jornada Pernambucana de Radiologia  
And XIX Curso de Diagnóstico por Imagem da Mama  
Sociedade de Radiologia de Pernambuco  
Recife, Brazil  
September 12, 2009

“Imaging Brain Tumors: Fundamentals and Advances”

XII Jornada Pernambucana de Radiologia and XIX Curso de Diagnóstico por Imagem  
Sociedade de Radiologia de Pernambuco  
Recife, Brazil  
September 12, 2009

“Advances in Brain MRI”

Annual Scientific Assembly  
SORBA (Sociedade de Radiologia e Diagnóstico por Imagem da Bahia)  
Salvador, Bahia  
Brazil  
September 14, 2009

“Doctors in Public Advocacy”

Invited Panel Member  
First Year School of Medicine Class  
Stanford University School of Medicine  
October 9, 2009

“Health Care Reform: Options and Consequences”

Invited Speaker  
Hoover Institution Fall Retreat  
Hoover Institution  
Stanford University  
October 19, 2009

“Advances in MRI: Rationale and Emerging Clinical Applications”

Guest Speaker  
RDO Diagnostic Clinic  
Sao Paulo, Brazil  
December 12, 2009

2010

“Advances in MRI of the Brain: High Field and Beyond”

Invited Speaker  
63<sup>rd</sup> Annual Conference  
India Radiology and Imaging Association 2010  
Ahmedabad, India  
January 23, 2010

“Stroke Imaging: What is True and What Might Be True”

Invited Speaker  
63<sup>rd</sup> Annual Conference  
India Radiology and Imaging Association 2010  
Ahmedabad, India  
January 24, 2010

*Multiple Lectures*

Stoller & Atlas:  
A Case by Case Tutorial in Musculoskeletal and NeuroRadiology  
Wynn Hotel and Resort  
Las Vegas, Nevada  
January 28-30, 2010

“Advances in MRI of the Brain: High Field and Beyond”

18th Annual Radiology Conference  
Stanford University Department of Radiology  
Maui, Hawaii  
March 24-25, 2010

“Stroke Imaging: What is True and What Might Be True”

18th Annual Radiology Conference  
Stanford University Department of Radiology  
Maui, Hawaii  
March 24-25, 2010

“Brain Tumors: Fundamentals and Advances in Imaging”

18th Annual Radiology Conference  
Stanford University Department of Radiology  
Maui, Hawaii  
March 24-25, 2010

“Intracranial Hemorrhage: Imaging Update”

18th Annual Radiology Conference  
Stanford University Department of Radiology  
Maui, Hawaii  
March 24-25, 2010

“Advances in Brain MRI: High Field and Beyond”

XIV Radiology Meeting: Recent Advances in Brain CT and MR  
Aula Magna Clinica Alemana de Santiago  
Santiago, Chile  
April 22, 2010

“Health Care Reform: Facts, Options, and Consequences”  
Stanford Center for Cardiovascular Technology Annual Symposium 2010  
Stanford, California  
May 7, 2010

“Stroke MRI: Trends”  
2010 Annual Russia Radiology National Congress  
Moscow, Russia  
May 26, 2010

“Advances in Brain MRI: High Field and Beyond”  
2010 Annual Russia Radiology National Congress  
Moscow, Russia  
May 26, 2010

“Health Care Reform: Facts, Options, and Consequences”  
Sierra Ventures - Kaiser Permanente Health IT Summit  
Palo Alto, California  
June 2, 2010

“Stroke Imaging: Rationale and Current Status”  
Guest Speaker  
RDO Diagnostic Clinic  
Sao Paulo, Brazil  
August 10, 2010

“American Health Care: Ignored Facts and Ignored Options for Reform”  
Sectoral Asset Management Group  
Hoover Institution  
Stanford, California  
September 9, 2010

“America’s Health Care: Ignored Facts and Disregarded Options”  
Southern California Seminar  
Hoover Institution  
Los Angeles, California  
September 29, 2010

“Technology in Neuroradiology: Rationale and Drivers”  
Plenary Speaker  
Symposium Neuroradiologicum  
Bologna, Italy  
October 5, 2010

“Reforming America’s Health Care System: Ignored Facts and Disregarded Options”

October Retreat  
Hoover Institution  
Stanford, California  
October 18, 2010

“Doctors in Public Advocacy”

Invited Panel Member, First Year School of Medicine Class  
Stanford University School of Medicine  
November 8, 2010

“Reforming America’s Health Care System: Ignored Facts and Disregarded Options”

November Special Symposium  
Hoover Institution  
Stanford, California  
November 18, 2010

“New Frontiers in MRI: Fetal Imaging”

RDO Diagnostic Clinic  
Sao Paulo, Brazil  
December 11, 2010

2011

“MRI in Cerebrovascular Disease”

RDO Diagnostic Clinic  
Sao Paulo, Brazil  
February 11, 2011

“Technology and Innovation in Radiology”

67<sup>th</sup> Annual Holmes Lecture  
New England Roentgen Ray Society  
Harvard Medical School  
April 8, 2011

“MRI in Brain Tumors: Fundamentals and Advances”

RDO Diagnostic Clinic  
Sao Paulo, Brazil  
May 10, 2011

“Technology Advances in Radiology”

Primeiro Curso da  
Sociedade Brasileira de Neurorradiologia Diagnostica e Terapeutica  
Fortaleza, Brazil  
May 28, 2011

“Stroke Imaging: Current Status”

Primeiro Curso da  
Sociedade Brasileira de Neurorradiologia Diagnostica e Terapeutica  
Fortaleza, Brazil  
May 28, 2011

“MRI in Brain Tumors: Fundamentals and Advances”

Primeiro Curso da  
Sociedade Brasileira de Neurorradiologia Diagnostica e Terapeutica  
Fortaleza, Brazil  
May 28, 2011

“Imaging Intracranial Hemorrhage: Update”

Primeiro Curso da  
Sociedade Brasileira de Neurorradiologia Diagnostica e Terapeutica  
Fortaleza, Brazil  
May 28, 2011

“Fetal MRI in the CNS”

Primeiro Curso da  
Sociedade Brasileira de Neurorradiologia Diagnostica e Terapeutica  
Fortaleza, Brazil  
May 28, 2011

“Technology Advances in Radiology”

Visiting Professor and Invited Lecturer  
University Hospital of Zurich Neurologic Institute  
Zurich, Switzerland  
July 13, 2011

“Technology Advances in Radiology”

Visiting Professor and Invited Lecturer  
Dartmouth Medical Center  
Lebanon, New Hampshire  
July 27, 2011

“Advances in MRI of the Brain”

Invited Speaker  
6th Annual Meeting of the SMRT Australia-New Zealand Chapter  
Brisbane Convention and Exhibition Centre  
Brisbane, Australia  
August 13-14, 2011



“Imaging Brain Tumors: Fundamentals and Advances”

Invited Speaker  
6th Annual Meeting of the SMRT Australia-New Zealand Chapter  
Brisbane Convention and Exhibition Centre  
Brisbane, Australia  
August 13-14, 2011

“Rheumatology and the Brain: The Role of Imaging”

RDO Diagnostic Clinic  
Sao Paulo, Brazil  
September 17, 2011

“Health Care Reform: Setting the Record Straight on America’s Health Care”

Fall Retreat  
Hoover Institution 47<sup>th</sup> Annual Retreat  
Stanford, California  
October 17, 2011

“Health Care Reform: Setting the Record Straight on America’s Health Care”

Special Seminar  
Hoover Institution  
Stanford, California  
November 8, 2011

“Health Care Reform: Setting the Record Straight on America’s Health Care”

November Retreat  
Hoover Institution 48<sup>th</sup> Annual Retreat  
Stanford, California  
November 17, 2011

2012

“America’s Health Care and the Principles for Reform ”

Hoover Institution Board of Overseers Annual Meeting  
Willard Intercontinental Washington Hotel  
Washington, DC  
February 27, 2012

*Multiple Lectures:*

Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Hotel and Resort  
Las Vegas, Nevada  
March 1-3, 2012

“America’s Health Care and the Principles for Reform ”

Hoover Institution Desert Conference  
Vintage Club  
Indian Wells, CA  
March 19, 2012

“Advances in MRI of the Brain”

Invited Speaker  
Special MRI Seminar  
Ho Chi Minh City, Viet Nam  
May 3, 2012

“MRI of Brain Tumors: Fundamentals and Advances”

Invited Speaker  
Special MRI Seminar  
Surabaya, Indonesia  
May 3, 2012

“MRI of Brain Tumors: Fundamentals and Advances”

Invited Speaker  
Special MRI Seminar  
Surabaya, Indonesia  
May 4, 2012

“Advances in MRI of the Brain”

Invited Speaker  
Special Seminar, Indonesia Society of Radiology  
Jakarta, Indonesia  
May 5, 2012

“MRI of Brain Tumors: Fundamentals and Advances”

Invited Speaker  
Special Seminar, Indonesia Society of Radiology  
Jakarta, Indonesia  
May 5, 2012

“MRI of Brain Tumors: Fundamentals and Clinical Analysis”

Invited Speaker  
II Curso de Atualizacoe da Sociedade Brasileira De  
Neurorradiologia Diagnostica e Terapeutica  
Fortaleza, Brazil  
May 25-26, 2012

“Stroke Imaging: Clinical Case Analysis”

Invited Speaker  
II Curso de Atualizacoe da Sociedade Brasileira De  
Neurorradiologia Diagnostica e Terapeutica  
Fortaleza, Brazil  
May 25-26, 2012

“Imaging of the Eye and Orbit”

Invited Speaker  
II Curso de Atualizacoe da Sociedade Brasileira  
De Neurorradiologia Diagnostica e Terapeutica  
Fortaleza, Brazil  
May 25-26, 2012

“MRI in Brain Tumors: Fundamentals and Advanced Applications”

Visiting Professor and Invited Lecturer  
University Hospital of Zurich Neurologic Institute  
Zurich, Switzerland  
June 19, 2012

“Stroke Imaging: Current Status”

Invited Speaker  
XXII Jornada Gaucha de Radiologia and the X Jornada Sul Brasileira de Radiologia  
Porto Alegre, Brazil  
July 13-14, 2012

“MRI of Intracranial Hemorrhage: Update”

Invited Speaker  
XXII Jornada Gaucha de Radiologia and the X Jornada Sul Brasileira de Radiologia  
Porto Alegre, Brazil  
July 13-14, 2012

“Advances in MR of the Brain: High Field and Beyond”

Invited Speaker  
XXII Jornada Gaucha de Radiologia and the X Jornada Sul Brasileira de Radiologia  
Porto Alegre, Brazil  
July 13-14, 2012

“Imaging Brain Tumors: Fundamentals and Advances”

Invited Speaker  
XXII Jornada Gaucha de Radiologia and the X Jornada Sul Brasileira de Radiologia  
Porto Alegre, Brazil  
July 13-14, 2012

“Stroke Imaging: Current Status”

Invited Speaker  
XLI Congresso Brasileiro de Radiologia  
Brasilia, Brazil  
September 6-8, 2012

“MRI of Intracranial Hemorrhage: Update”

Invited Speaker  
XLI Congresso Brasileiro de Radiologia  
Brasilia, Brazil  
September 6-8, 2012

“Technology Innovation in Radiology”

Invited Speaker  
XLI Congresso Brasileiro de Radiologia  
Brasilia, Brazil  
September 6-8, 2012

“Imaging Multiple Sclerosis: Clinical Significance and Differential Diagnosis”

Invited Speaker  
XLI Congresso Brasileiro de Radiologia  
Brasilia, Brazil  
September 6-8, 2012

“Imaging Brain Tumors: Fundamentals and Advances”

Invited Speaker  
XLI Congresso Brasileiro de Radiologia  
Brasilia, Brazil  
September 6-8, 2012

“Health Care Reform: Setting the Record Straight on America’s Health Care”

Hoover Institution Public Policy Conference  
Sunset Ridge Country Club  
Northfield, IL  
September 11, 2012

“Health Care Reform: Saving America’s Safety Net”

Hoover Institution Southern California Conference  
Century City Hotel  
Century City, Los Angeles, CA  
September 27, 2012

“Setting the Record Straight on America’s Health Care”  
Hoover Institution Orange County Director’s Dinner  
Pacific Club  
Newport Beach, CA  
October 10, 2012

2013

*Multiple Lectures:*

Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Hotel and Resort  
Las Vegas, Nevada  
February 21-23, 2013

“Imaging Brain Tumors: Fundamentals and Advances”  
Invited Speaker  
IV Congresso Cearense de Radiologia  
Fortaleza, Brazil  
June 14-15, 2013

“Imaging Multiple Sclerosis: Clinical Significance and Differential Diagnosis”  
Invited Speaker  
IV Congresso Cearense de Radiologia  
Fortaleza, Brazil  
June 14-15, 2013

“Brain Tumors: Unknown Cases”  
Invited Speaker  
IV Congresso Cearense de Radiologia  
Fortaleza, Brazil  
June 14-15, 2013

“Imaging Brain Tumors: Fundamentals and Advances”  
Invited Speaker  
XXV Congress, Ibero-Latin American Society of Diagnostic and Therapeutic Neuroradiology (SILAN).  
Panama City, Panama  
June 17-18, 2013

“Advances in MRI of the Brain”  
Invited Speaker  
XXV Congress, Ibero-Latin American Society of Diagnostic and Therapeutic Neuroradiology (SILAN).  
Panama City, Panama  
June 17-18, 2013

“Intracranial Hemorrhage: Role of MRI”

Invited Speaker

XXV Congress, Ibero-Latin American Society of Diagnostic and Therapeutic Neuroradiology (SILAN).

Panama City, Panama

June 17-18, 2013

“Stroke: Case by Case Analysis”

Visiting Professor and Invited Lecturer

University Hospital of Zurich Neurologic Institute

Zurich, Switzerland

June 24, 2012

“Imaging Stroke: Current Status”

Visiting Professor and Invited Lecturer

University Hospital of Zurich Neurologic Institute

Zurich, Switzerland

June 25, 2013

“Obamacare: Update”

Hoover Institution Jackson Hole Conference

Hoover Institution, Stanford University

Shooting Star Country Club, Teton Village

Jackson Hole, Wyoming

August 1, 2013

“MRI of Stroke and Hemorrhage”

Invited Lecturer

Chulalongkorn Hospital

Bangkok, Thailand

September 11, 2013

“Recent Advances in MRI of the Brain”

Invited Lecturer

Chulalongkorn Hospital

Bangkok, Thailand

September 11, 2013

“MRI of Stroke and Hemorrhage”

Invited Lecturer

University of Malay Medical Center Research Symposium

Kuala Lumpur, Malaysia

September 13, 2013

“Recent Advances in MRI of the Brain”

Invited Lecturer  
University of Malay Medical Center Research Symposium  
Kuala Lumpur, Malaysia  
September 13, 2013

“Brain Tumor Imaging”

Invited Lecturer  
University of Malay Medical Center Research Symposium  
Kuala Lumpur, Malaysia  
September 13, 2013

“Technology Innovation in Neuroradiology”

Special Seminar  
National University of Singapore  
Marriott Hotel, Singapore  
September 14, 2013

“Intracranial Hemorrhage: Case by Case Analysis”

Visiting Professor and Invited Lecturer  
University Hospital of Zurich Neurologic Institute  
Zurich, Switzerland  
October 15, 2013

“Imaging Hemorrhage: Principles and MRI Update”

Visiting Professor and Invited Lecturer  
University Hospital of Zurich Neurologic Institute  
Zurich, Switzerland  
October 16, 2013

“Brain Tumors: Case by Case Analysis”

Visiting Professor and Invited Lecturer  
University Hospital of Zurich Neurologic Institute  
Zurich, Switzerland  
December 9, 2013

“Imaging Brain Tumors: Fundamentals and Advanced Applications”

Visiting Professor and Invited Lecturer  
University Hospital of Zurich Neurologic Institute  
Zurich, Switzerland  
December 10, 2013

2014

“MRI of Head Trauma and Intracranial Hemorrhage”

Invited Speaker  
IV Congresso Cearense de Radiologia  
Fortaleza, Brazil  
February 22, 2014

*Multiple Lectures:*

Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Hotel and Resort  
Las Vegas, Nevada  
March 8-10, 2014

“Imaging Diseases of the Eye and Orbit”

Visiting Professor and Invited Lecturer  
University Hospital of Zurich Neurologic Institute  
Zurich, Switzerland  
April 29, 2014

“Imaging the Pituitary and Sella”

Visiting Professor and Invited Lecturer  
University Hospital of Zurich Neurologic Institute  
Zurich, Switzerland  
April 28, 2014

“Technology Innovation in Neuroradiology”

Visiting Professor and Invited Lecturer  
Clinical Neurosciences Center Grand Rounds  
University Hospital of Zurich  
Zurich, Switzerland  
August 21, 2014

*Multiple Lectures:*

Zurich Course on Diagnostic and Interventional Neuroradiology  
University Hospital of Zurich  
Zurich, Switzerland  
August 22-27, 2014

“Health Care Reform in the United States: Update”

Keynote Speaker  
2014 Annual Board Dinner Meeting  
Ann & Robert H. Lurie Children’s Hospital of Chicago  
Chicago, Illinois  
October 15, 2014



“Imaging Stroke: Current Status”

Invited Speaker

XXVI Congress, Ibero-Latin American Society of Diagnostic and Therapeutic Neuroradiology (SILAN).

Sao Paulo, Brazil

November 3, 2014

“Technology Innovation in Neuroradiology: Key Issues and Future Considerations”

Invited Speaker

XXVI Congress, Ibero-Latin American Society of Diagnostic and Therapeutic Neuroradiology (SILAN).

Sao Paulo, Brazil

November 3, 2014

“Imaging Brain Tumors: Fundamentals and Advances”

Visiting Professor and Invited Lecturer

University Hospital of Zurich Neurologic Institute

Zurich, Switzerland

November 17, 2014

“Brain Tumors: Case by Case Analysis”

Visiting Professor and Invited Lecturer

University Hospital of Zurich Neurologic Institute

Zurich, Switzerland

November 18, 2014

2015

“Brain Tumor Imaging: Principles and Advances”

Invited Speaker; *MR Imaging @NUH*

National University Hospital of Singapore

Singapore

January 16, 2015

“Brain Tumor Imaging: Case Discussion”

Invited Speaker; *MR Imaging @NUH*

National University Hospital of Singapore

Singapore

January 16, 2015

“Multiple Sclerosis and White Matter Diseases: Updates”

Invited Speaker; *MR Imaging @NUH*

National University Hospital of Singapore

Singapore

January 16, 2015

“Multiple Sclerosis and White Matter Diseases: Case Discussion”

Invited Speaker; *MR Imaging @NUH*  
National University Hospital of Singapore  
Singapore  
January 16, 2015

“Imaging Intracranial Hemorrhage: Concepts and Update”

Invited Speaker; *MR Imaging @NUH*  
National University Hospital of Singapore  
Singapore  
January 17, 2015

“Intracranial Hemorrhage: Case Discussion”

Invited Speaker; *MR Imaging @NUH*  
National University Hospital of Singapore  
Singapore  
January 17, 2015

“Imaging Stroke: Current Status”

Invited Speaker; *MR Imaging @NUH*  
National University Hospital of Singapore  
Singapore  
January 17, 2015

“Stroke: Case Discussion”

Invited Speaker; *MR Imaging @NUH*  
National University Hospital of Singapore  
Singapore  
January 17, 2015

“MRI of Brain Tumors: Principles and Advances”

Special MRI Seminar  
JW Marriott Hotel  
Jakarta, Indonesia  
January 18, 2015

“Imaging Stroke: Current Status and Challenges”

Special MRI Seminar  
JW Marriott Hotel  
Jakarta, Indonesia  
January 18, 2015

“MRI of Brain Tumors: Principles and Advances”

Invited Speaker  
Bach Mai Hospital  
Hanoi, Vietnam  
January 19, 2015

“Imaging Stroke: Current Status and Challenges”

Invited Speaker  
Bach Mai Hospital  
Hanoi, Vietnam  
January 19, 2015

“MRI of Brain Tumors: Principles and Advances”

Invited Speaker  
Cho Ray Hospital  
Ho Chi Minh City, Vietnam  
January 20, 2015

“Imaging Stroke: Current Status and Challenges”

Invited Speaker  
Cho Ray Hospital  
Ho Chi Minh City, Vietnam  
January 20, 2015

*Multiple Lectures:*

Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Hotel and Resort  
Las Vegas, Nevada  
February 12-14, 2015

“Obamacare: Implementation and Reform”

Invited Speaker  
Symposium: *The Affordable Care Act in 2015*  
NYU School of Law  
The Classical Liberal Institute & NYU Journal of Law & Liberty  
New York, New York  
March 10, 2015

*Multiple Lectures:*

Scott Atlas’ Neuroradiology Tutorial  
Renaissance Hotel  
Sao Paulo, Brazil  
April, 2015

“Stroke Imaging: Fundamentals and Current Status”

Visiting Professor and Invited Lecturer  
University Hospital of Zurich Neurologic Institute  
Zurich, Switzerland  
April 21, 2015

“Multiple Sclerosis: The Role of Imaging”

Visiting Professor and Invited Lecturer  
University Hospital of Zurich Neurologic Institute  
Zurich, Switzerland  
April 22, 2015

“Health Care Reform: America’s Health Care, Before and After Obamacare”

Invited Speaker  
Symposium: *The Affordable Care Act Turns Five...What We Know Now*  
Hoover Institution, Washington, D.C.  
April 30, 2015

“Health Care Reform: Setting the Record Straight on America’s Health Care”

Invited Speaker  
American College of Radiology 2015 Annual Meeting  
Marriott Hotel Wardman Park  
Washington, D.C.  
May 17, 2015

“Innovation in Medical Technology: Global Trends and Implications for Radiology”

Invited Speaker  
2015 Annual Sonic Imaging Conference  
Gold Coast, Australia  
May 30, 2015

“Imaging Brain Tumors: Fundamentals and Advances”

Invited Speaker  
2015 Annual Sonic Imaging Conference  
Gold Coast, Australia  
May 30, 2015

“MS and Adult White Matter Disease: The Role of Imaging”

Invited Speaker  
2015 Annual Sonic Imaging Conference  
Gold Coast, Australia  
May 30, 2015

*Multiple Lectures:*

23<sup>rd</sup> Annual Zurich Course on Diagnostic and Interventional Neuroradiology  
University Hospital of Zurich  
Zurich, Switzerland  
August 31-September 5, 2015

“MRI-based Patient Selection in Acute Ischemic Stroke”

Invited Speaker  
Campo Base NeuroVascolare  
Azienda Ospedaliero-Universitaria Careggi  
Nuovo Ingresso Careggi - NIC  
Florence, Italy  
October 8, 2015

“MRI of the CNS: Efficacy and Efficiency in Contrast Use”

Meeting Moderator and Overall Discussant  
Curriculum Development Meeting  
The Westin Michigan Avenue  
Chicago, Illinois  
October 23-25, 2015

“Brain Tumor Imaging: Principles and Advances”

Special Tutorial: Advances in Brain MRI  
GE Healthcare Latin America  
SENAI University  
Sao Paulo, Brazil  
November 17, 2015

“MS and White Matter Diseases: Update”

Special Tutorial: Advances in Brain MRI  
GE Healthcare Latin America  
SENAI University  
Sao Paulo, Brazil  
November 17, 2015

“Imaging Stroke: Current Status”

Special Tutorial: Advances in Brain MRI  
GE Healthcare Latin America  
SENAI University  
Sao Paulo, Brazil  
November 17, 2015

“Update on Imaging Brain Tumors: Fundamentals and Advances”

Webinar  
GE Healthcare Latin America  
Sao Paulo, Brazil  
November 18, 2015

2016

“America’s Health Care, Before and After Obamacare”

JMI Private Equity Special Event  
JP Morgan Healthcare Annual Meeting  
San Francisco, California  
January 12, 2016

“Cleaning up the Obamacare Mess: Restoring Quality Health Care at Lower Cost”

Hoover Institution Southern California Conference  
Hoover Institution, Stanford University  
Pasadena, California  
February 1, 2016

*Multiple Lectures:*

Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Hotel and Resort  
Las Vegas, Nevada  
February 18-20, 2016

“Instilling Incentives and Rational Tax Reform to Restore Quality Health Care at Lower Cost”

Fiscal Foundations Forum  
Joint Economic Committee staff  
Rayburn House Office Building, Capitol Hill  
Washington, DC  
March 15, 2016

“Cleaning up the Obamacare Mess: Restoring Quality Health Care at Lower Cost”

Hoover Institution Board of Overseers Spring Retreat  
Hoover Institution, Stanford University  
Stanford, California  
April 18, 2016

“Multiple Sclerosis: The Role of Imaging”

2016 Annual Meeting  
Pernambuco Sociedade da Radiologia  
Recife, Brazil  
June 11, 2016

“Imaging Acute Stroke: The Changing Landscape”

2016 Annual Meeting  
Pernambuco Sociedade da Radiologia  
Recife, Brazil  
June 11, 2016

“MRI of Brain Tumors: Fundamentals and Advances”

Visiting Professor  
All India Medical Institute  
Delhi, India  
August 12, 2016

“Imaging Acute Stroke: The Changing Landscape”

Visiting Professor  
All India Medical Institute  
Delhi, India  
August 12, 2016

“MRI of Brain Tumors: Fundamentals and Advances”

Special Seminar  
Taj Hotel  
Delhi, India  
August 12, 2016

“Imaging Acute Stroke: The Changing Landscape”

Special Seminar  
Taj Hotel  
Delhi, India  
August 12, 2016

“MRI of Brain Tumors: Fundamentals and Advances”

Special Seminar  
Chennai, India  
August 13, 2016

“Imaging Acute Stroke: The Changing Landscape”

Special Seminar  
Chennai, India  
August 13, 2016

*Multiple Lectures:*

24<sup>th</sup> Annual Zurich Course on Diagnostic and Interventional Neuroradiology  
University Hospital of Zurich  
Zurich, Switzerland  
August 22-27, 2016

“Medicaid Reform to Eliminate Second-Class Health Care for the Poor”

Keynote Speaker  
Medicaid Drug Rebate Program Summit  
Palmer House Hotel  
Chicago, IL  
September 23, 2016

*Multiple Lectures:*

- Update in Neuro Imaging  
Site Oud Sint-Jan  
Bruges, Belgium  
October 6-8, 2016
  
- “Innovation in Medical Technology: Global Trends and Implications for Radiology”  
Keynote Lecture  
Update in Neuro Imaging  
Site Oud Sint-Jan  
Bruges, Belgium  
October 6-8, 2016
  
- “Regulation and the Law: The Burden of Regulation on US Health Care and How to Fix It”  
American Exceptionalism in the 21<sup>st</sup> Century  
Hoover Institution Fall Retreat  
Hoover Institution, Stanford University  
Stanford, California  
October 17-18, 2016
  
- “Cleaning up the Obamacare Mess: Restoring Quality Health Care at Lower Cost”  
Hoover Institution Special Seminar  
Estancia Hotel  
La Jolla, California  
November 2, 2016

2017

- “Imaging Acute Stroke: The Evolving Landscape”  
70th Annual Conference  
Indian Radiological and Imaging Association  
Jaipur, India  
January 7, 2017
  
- “Technology Innovation in Radiology: Trends and Projections”  
70th Annual Conference  
Indian Radiological and Imaging Association  
Jaipur, India  
January 7, 2017
  
- “MRI of Brain Tumors: Fundamentals and Advances”  
Special Seminar  
Taj Hotel  
Bangalore, India  
January 8, 2017



“MRI of Brain Tumors: Unknown Cases”

Special Seminar  
Taj Hotel  
Bangalore, India  
January 8, 2017

“Technology Innovation in Radiology: Trends and Projections”

Special Seminar  
Taj Hotel  
Pune, India  
January 9, 2017

*Multiple Lectures:*

Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Hotel and Resort  
Las Vegas, Nevada  
February 9-11, 2017

“Health Care Reform Post-Obamacare”

Hoover Institution Board of Overseers Meeting  
Hoover Institution, Stanford University  
Willard Intercontinental Washington, Washington DC  
February 27, 2017

“Health Care Reform Post-ACA”

American Enterprise Institute's Executive Council  
Stanford University  
Stanford, California  
March 7, 2017

“Cleaning Up the Obamacare Mess”

Hoover Institution Special Event  
Pacific Union Club  
San Francisco, California  
March 16, 2017

“Medical Technology Innovation: Trends and Implications”

Invited Speaker  
2017 Jornado Paulista de Radiologia  
Sao Paulo, Brazil  
May 4-6, 2017

“Technology Innovation in Neuroradiology: Key Issues and Future Considerations”

Invited Speaker  
2017 Jornado Paulista de Radiologia  
Sao Paulo, Brazil  
May 4-6, 2017

“Imaging of Brain Tumors: Fundamentals and Advances”

Invited Speaker  
2017 Jornado Paulista de Radiologia  
Sao Paulo, Brazil  
May 4-6, 2017

“Health Care Reform in the Trump Era: What To Expect”

Hoover Institution Seminar  
Dallas, Texas  
May 10-11, 2017

“The Trump Health Care Agenda: Impact on Medicaid”

Medicaid Managed Care Congress  
Hyatt Regency Baltimore Inner Harbor  
Baltimore, Maryland  
May 23, 2017

“Healthcare Reform in the Post Obamacare Era”

Washington University School of Medicine  
Mallinckrodt Institute of Radiology Grand Rounds  
St. Louis, Missouri  
June 14, 2017

“Setting The Record Straight On America’s Health Care”

Hoover Institution Summer Policy Boot Camp  
Stanford, California  
August 21, 2017

“Medicaid Reform in the Trump Era”

Keynote Speaker  
Medicaid Drug Rebate Program Summit  
Marriott Hotel  
Chicago, IL  
September 13, 2017

“MRI in Multiple Sclerosis”

Invited Speaker  
Nanavati Hospital  
Mumbai, India  
September 25, 2017

“MRI of Brain Tumors: Fundamentals and Advances”

Invited Speaker  
Nanavati Hospital  
Mumbai, India  
September 25, 2017

“Medical Technology Innovation: Trends and Implications”  
Special Seminar “Advances in MRI”  
Mumbai, India  
September 25, 2017

“MRI of Brain Tumors: Fundamentals and Advances”  
Special Seminar “Advances in MRI”  
Mumbai, India  
September 25, 2017

“MRI of Brain Tumors: Fundamentals and Advances”  
Invited Speaker  
Shri Chitra Hospital and Research Center  
Trivandrum, India  
September 26, 2017

“Unknown Case Discussion”  
Invited Speaker  
Shri Chitra Hospital and Research Center  
Trivandrum, India  
September 26, 2017

“Acute Stroke Imaging: The Evolving Landscape”  
Special Seminar “Advances in MRI”  
Taj Vivanta Hotel  
Trivandrum, India  
September 26, 2017

“Imaging Multiple Sclerosis”  
Special Seminar “Advances in MRI”  
Taj Vivanta Hotel  
Trivandrum, India  
September 26, 2017

“Technology Innovation in Radiology: Trends and Implications”  
Special Seminar “Advances in MRI”  
Kuala Lumpur, Malaysia  
September 27, 2017

“MRI of Brain Tumors: Fundamentals and Advances”  
Special Seminar “Advances in MRI”  
Ho Chi Minh City, Vietnam  
September 28, 2017

“Technology Innovation in Radiology: Trends and Implications”  
Special Seminar “Advances in MRI”  
Ho Chi Minh City, Vietnam  
September 28, 2017

“Health Care Reform in the Trump Era: What to Expect”

Keynote Speaker  
15<sup>th</sup> Annual Healthcare Leaders Conference  
Four Seasons at Las Colinas Hotel  
Dallas, TX  
October 5, 2017

“Health Care Reform: Setting the Record Straight”

Invited Speaker  
2017 Stanford Reunion Homecoming: Classes Without Quizzes  
Stanford University  
Stanford, CA  
October 12, 2017

*Multiple Lectures:*

Atlas & Som: Neuroradiology of the Brain, Spine, Head & Neck  
Wynn Hotel and Resort  
Las Vegas, Nevada  
February 17-19, 2018

“Trump Era Health Care Reform”

Hoover Institution Board of Overseers Meeting  
Hoover Institution, Stanford University  
Willard Intercontinental Washington, Washington DC  
February 26, 2018

“Competition-Based Health Care Reform”

Council of Economic Advisors to the White House  
Washington DC  
February 26, 2018

“Health Care Reform: What Now?”

Director’s Dinner  
Hoover Institution  
Newport Beach, California  
April 5, 2018

“Global Trends in Health Care Innovation”

Keynote Address  
TechTools Group  
Sao Paulo, Brazil  
April 16, 2018

“Health Care Reform in the Post Obamacare Era”

Benjamin Rush Society  
Saint Louis University School of Medicine  
St. Louis, Missouri  
May 3, 2018

“Problematic Active Cases”

Visiting Professor  
Ramakrishna Hospital  
Coimbatore, India  
July 23, 2018

“Acute Stroke Imaging: The Changing Role of Imaging”

Special Seminar “Advances in MRI”  
Radisson Hotel  
Coimbatore, India  
July 23, 2018

“Unknown Case Discussion”

Special Seminar “Advances in MRI”  
Radisson Hotel  
Coimbatore, India  
July 23, 2018

“Imaging MS and White Matter Diseases”

Special Seminar “Advances in MRI”  
Radisson Hotel  
Coimbatore, India  
July 23, 2018

“MRI of Brain Tumors: Fundamentals and Advances”

Special Seminar “Advances in MRI”  
Taj Bengal Hotel  
Kolkata, India  
July 24, 2018

“Technology Innovation in Radiology: Trends and Implications”

Special Seminar “Advances in MRI”  
Taj Bengal Hotel  
Kolkata, India  
July 24, 2018

“Acute Stroke Imaging: The Evolving Landscape”

“CT and MRI Update”, Jaslok Hospital & Research Centre  
Radisson Blu Hotel  
Goa, India  
July 25, 2018

“Imaging MS and White Matter Diseases”

“CT and MRI Update”, Jaslok Hospital & Research Centre  
Radisson Blu Hotel  
Goa, India  
July 25, 2018

“MRI of Brain Tumors: Fundamentals and Advances”  
“CT and MRI Update”, Jaslok Hospital & Research Centre  
Radisson Blu Hotel  
Goa, India  
July 25, 2018

“Technology Innovation in Radiology: Trends and Implications”  
“CT and MRI Update”, Jaslok Hospital & Research Centre  
Radisson Blu Hotel  
Goa, India  
July 25, 2018

“Global Trends in Health Care Innovation”  
Special Seminar, GE Healthcare  
Hilton Hotel  
Bandung, Indonesia  
August 13, 2018

“Imaging Acute Stroke: The Evolving Landscape”  
“New Horizons in Head and Neck and Neuro Imaging”  
Borromeus Hospital  
Bandung, Indonesia  
August 14, 2018

“MRI of Brain Tumors: Fundamentals and Advances”  
“New Horizons in Head and Neck and Neuro Imaging”  
Borromeus Hospital  
Bandung, Indonesia  
August 14, 2018

“Imaging Acute Stroke: The Evolving Landscape”  
Special Seminar, GE Healthcare  
JW Marriott Hotel  
Bangkok, Thailand  
August 15, 2018

“MRI of Brain Tumors: Fundamentals and Advances”  
Special Seminar, GE Healthcare  
JW Marriott Hotel  
Bangkok, Thailand  
August 15, 2018

“Global Trends in Health Care Innovation”  
Special Seminar, GE Healthcare  
JW Marriott Hotel  
Hanoi, Vietnam  
August 16, 2018

“Unknown Case Discussion”

Special Seminar, GE Healthcare  
JW Marriott Hotel  
Bangkok, Thailand  
August 15, 2018

“Unknown Case Discussion”

Special Seminar, GE Healthcare  
JW Marriott Hotel  
Hanoi, Vietnam  
August 16, 2018

“Imaging Acute Stroke: The Evolving Landscape”

Invited Speaker  
20<sup>th</sup> Vietnam National Radiology & Nuclear Medicine Congress  
JW Marriott Hotel  
Hanoi, Vietnam  
August 17, 2018

“Setting The Record Straight On America’s Health Care”

Hoover Institution Summer Policy Boot Camp  
Stanford, California  
August 23, 2018

“Health Care Reform in The Trump Era: Where to Next?”

2019 Hoover Spring Retreat  
Hoover Institution  
Stanford, California  
April 16, 2019

“Health Care Reform: What Now?”

Director’s Dinner  
Hoover Institution  
University of Denver  
Denver, Colorado  
April 24, 2019

“Imaging MS and White Matter Diseases”

Visiting Professor, GE Healthcare Event  
St. Luke’s Hospital  
Manila, Philippines  
April 29, 2019

“Global Trends in Health Care Innovation”

Special Seminar, GE Healthcare  
Conrad Hotel  
Manila, Philippines  
April 29, 2019

“Unknown Case Discussion”

Special Seminar, GE Healthcare  
Conrad Hotel  
Manila, Philippines  
April 29, 2019

“MRI of Brain Tumors: Fundamentals and Advances”

Invited Speaker  
Philippines Society of Radiology Annual Meeting  
Conrad Hotel  
Manila, Philippines  
April 30, 2019

“Imaging Acute Stroke: The Evolving Landscape”

Invited Speaker  
Philippines Society of Radiology Annual Meeting  
Conrad Hotel  
Manila, Philippines  
April 30, 2019

“MRI of Brain Tumors: Fundamentals and Advances”

Special Seminar, GE Healthcare  
Intercontinental Hotel  
Jakarta, Indonesia  
May 1, 2019

“Unknown Case Discussion”

Special Seminar, GE Healthcare  
Intercontinental Hotel  
Jakarta, Indonesia  
May 1, 2019

“Health Care Reform: What Now?”

Director’s Wine Country Lunch  
Hoover Institution  
St. Helena, California  
June 19, 2019

“Setting The Record Straight On America’s Health Care, and Where To From Here”

Hoover Institution Summer Policy Boot Camp  
Stanford, California  
August 22, 2019

“Health Care Reform: What Now?”

Economics Fellowship Program  
Hoover Institution  
Stanford, California  
August 23, 2019



“Setting The Record Straight on America’s Health Care”

2019 Hoover Fall Retreat  
Hoover Institution  
Stanford, California  
October 21, 2019

“Setting The Record Straight on America’s Health Care: Where To Next?”

Director’s Seminar  
Hoover Institution  
New York, New York  
November 19, 2019

“What’s Next in US Health Care Reform”

Hoover Institution Board of Overseers Meeting  
Willard Intercontinental Washington, Washington DC  
February 24, 2019

**Bibliography; Journal Publications:**

1. Shkolnik A, Atlas SW, McClone D: Intraoperative neurosonography in pediatrics. *Radiographics* 1984; 4:945-962.
2. Atlas SW, Vogelzang R, Bressler E, Gore R, Bergan J: CT diagnosis of a mycotic aneurysm of the thoracoabdominal aorta. *J Comput Assist Tomogr* 1984; 8:1211-1212.
3. Bressler E, Vogelzang R, Atlas SW, Neiman H: Radiation injury to the axillary artery presenting as thromboembolism. *AJR* 1984; 143:1079-1080.
4. Smith S, Vogelzang R, Donovan J, Atlas SW, Gore R, Neiman H: Intraoperative sonography of the pancreas. *AJR* 1985; 144:557-562.
5. Atlas SW, Rochester D, Panella J, Larson R: The utilization of ultrasound in the diagnosis of wandering abdominal viscera. *JCU* 1985; 13:275-277.
6. Atlas SW, Shkolnik A, Naidich TP: Sonographic recognition of agenesis of the corpus callosum. *AJNR* 1985; 6:369-375; *AJR* 1985; 145: 167-173.
7. Regenbogen VS, Rogers LF, Atlas SW, Kim KS: Cervical spinal cord injuries in patients with cervical spondylosis. *AJR* 1986; 146:277-284.
8. Atlas SW, Regenbogen V, Rogers LF, Kim KS: The radiographic characterization of burst fractures of the spine. *AJNR* 1986; 7:675-682; *AJR* 1986; 147:575-582.
9. Atlas SW, Grossman RI, Packer RJ, Goldberg HI, Hackney DB, Zimmerman RA, Bilaniuk LT: Magnetic resonance imaging of disseminated necrotizing leukoencephalopathy. *CT: J Comput Tomogr* 1987; 11:39-43.

10. Atlas SW, Grossman RI, Hackney DB, Goldberg HI, Zimmerman RA, Bilaniuk LT:  
MR diagnosis of acute disseminated encephalomyelitis. *J Comput Assist Tomogr* 1986; 10:798-801.
11. Atlas SW, Grossman RI, Savino PJ, Sergott RC, Schatz NJ, Bosley TM, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA: Surface coil MR of orbital pseudotumor.  
*AJNR* 1987; 8:141-146; *AJR* 1987; 148:803-808.
12. Grossman RI, Gonzalez-Scarano F, Atlas SW, Galetta S, Silberberg DH:  
Multiple sclerosis: Gadolinium enhancement in MR imaging. *Radiology* 1986; 161:721-725.
13. Atlas SW, Zimmerman RA, Rorke L, Bilaniuk LT, Hackney DB, Goldberg HI, Grossman RI: Corpus callosum and limbic system: Neuroanatomic MR evaluation of developmental anomalies.  
*Radiology* 1986; 160:355-362.

14. Grossman RI, Gonzalez-Scarano F, Atlas SW, Galetta S, Silberberg D:  
Gadolinium-DTPA enhancement in magnetic resonance imaging of multiple sclerosis: a preliminary report. In: *Contrast Agents in Magnetic Resonance Imaging*, pages 121-123, Excerpta Medica, Inc., Amsterdam, 1986.
15. Atlas SW, Grossman RI, Goldberg HI, Hackney DB, Bilaniuk LT, Zimmerman RA:  
Partially thrombosed giant intracranial aneurysms: Correlation of MR and pathologic findings. *Radiology* 1987; 162:111-114.
16. Zimmerman RA, Atlas SW, Bilaniuk LT, Hackney DB, Goldberg HI, Grossman RI:  
MRI of cerebral aneurysms. *Acta Radiologica Supplementum* 1986; 369:107-109.
17. Atlas SW, Grossman RI, Savino PJ, Schatz NJ, Sergott RC, Bosley TM, Hackney DB, Goldberg HI, Zimmerman RA, Bilaniuk LT: Internuclear ophthalmoplegia: neuroanatomic - MR correlation. *AJNR* 1987; 8:243-247.
18. Atlas SW, Zimmerman RA, Bruce D, Schut L, Bilaniuk LT, Hackney DB, Goldberg HI, Grossman RI: Neurofibromatosis and agenesis of the corpus callosum in identical twins: MR diagnosis. *AJNR* 1988; 9:598-601.
19. Gonzalez-Scarano F, Grossman RI, Galetta S, Atlas SW, Silberberg DH: Multiple sclerosis disease activity correlates with gadolinium-enhanced magnetic resonance imaging. *Ann Neurol* 1987; 21:300-306.
20. Bilaniuk LT, Atlas SW, Zimmerman RA: Magnetic resonance imaging of the orbit. *Radiol Clin North Am* 1987; 25:509-528.
21. Atlas SW, Grossman RI, Axel L, Hackney DB, Bilaniuk LT, Goldberg HI, Zimmerman RA: Orbital lesions: proton spectroscopic phase dependent contrast MR imaging. *Radiology* 1987; 164:510-514.
22. Atlas SW, Grossman RI, Gomori JM, Guerry D, Hackney DB, Goldberg HI, Zimmerman RA, Bilaniuk LT: MR imaging of intracranial metastatic melanoma. *J Comput Assist Tomogr* 1987; 11:577-582.
23. Atlas SW, Grossman RI, Gomori JM, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA: Spin echo MR imaging of hemorrhagic intracranial malignant neoplasms. *Radiology* 1987; 164:71-77.
24. Atlas SW, Bilaniuk LT, Zimmerman RA, Hackney DB, Goldberg HI, Grossman RI:  
Orbit: initial experience with surface coil spin-echo MR imaging at 1.5T. *Radiology* 1987; 164:501-509.
25. Hackney DB, Atlas SW, Grossman RI, Gomori JM, Goldberg HI, Zimmerman RA, Bilaniuk LT:  
Subacute intracranial hemorrhage: contribution of spin density to appearance on spin-echo MR images. *Radiology* 1987; 165:199-202.

26. Atlas SW, Kemp SS, Rorke L, Grossman RI: Hemorrhagic intracranial retinoblastoma metastases: MR - pathologic correlation. *J Comput Assist Tomogr* 1988; 12:286-289.
27. Atlas SW, Grossman RI, Hackney DB, Gomori JM, Campagna N, Goldberg HI, Bilaniuk LT, Zimmerman RA: Calcified intracranial lesions: detection with gradient-echo acquisition rapid MR imaging. *AJNR* 1988; 9:253-259, *AJR* 1988; 150:1383-1389.
28. Grossman RI, Gomori JM, Goldberg HI, Hackney DB, Atlas SW, Kemp SS, Zimmerman RA, Bilaniuk LT: MR imaging of hemorrhagic conditions of the head and neck. *Radiographics* 1988; 8:441-454.
29. Atlas SW: MRI of intracranial neoplasms. *Diag Imag* 1987; 9:234-241.
30. Atlas SW: Intracranial vascular malformations and aneurysms: current imaging applications. *Radiol Clin North Am* 1988; 26:821-837.
31. Barkovich AJ, Atlas SW: Magnetic resonance imaging of intracranial hemorrhage. *Radiol Clin North Am* 1988; 26:801-820.
32. Lanciano R, Fowble B, Sergott R, Atlas S, Bosley T, Savino P, Rubenstein J, : The results of radiotherapy for orbital pseudotumor. *Int J Rad Onc Biol Phys* 1990; 18:407-411.
33. Atlas SW, Grossman RI, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA: STIR MR imaging of the orbit. *AJNR* 1988; 9:969-974.
34. Atlas SW, Mark AS, Grossman RI, Gomori JM: Intracranial hemorrhage: Gradient-echo MR imaging at 1.5T: Comparison with spin-echo imaging and clinical applications. *Radiology* 1988; 168:803-807.
35. Atlas SW, Mark AS, Fram EK, Grossman RI: Vascular intracranial lesions: applications of gradient echo MR imaging. *Radiology* 1988; 169:455-461.
36. Atlas SW: Magnetic resonance imaging of the orbit: current status. *Mag Res Q* 1989; 5:39-96.
37. Atlas SW, Mark AS, Fram EK: Aqueductal stenosis: Evaluation with gradient echo rapid MR imaging. *Radiology* 1988; 169:449-453.
38. Mark AS, Atlas SW: MRI of the cervical spine and cord. *MRI Decisions* 1988; 2:23-32.
39. Atlas SW: MR of the orbit: current imaging applications. *Semin Ultrasound, CT, MR* 1988; 9:381-400.
40. Fobben ES, Grossman RI, Atlas SW, Hackney DB, Goldberg HI, Zimmerman RA, Bilaniuk LT: MR characteristics of subdural hematomas and hygromas at 1.5T. *AJNR* 1989; 10:687-693.

41. Yousem D, Atlas SW, Grossman RI, Savino PJ, Sergott RC, Bosley TM: MR imaging of Tolosa-Hunt syndrome. *AJNR* 1989; 10:1181-1184.
42. Jackson DE, Atlas SW, Mani JR, Norman D: Intraspinal synovial cysts: MR imaging. *Radiology* 1989; 170:527-530.
43. Mark AS, Atlas SW: Progressive multifocal leukoencephalopathy in patients with AIDS: appearance on MR images. *Radiology* 1989; 173:517-520.
44. Quencer RM, Atlas SW, Batnitzky S, Bryan RN, Drayer BP, Grossman RI, Hasso AN, Lukin RR, Naidich TP, Vinuela F, Williams AL, Yock DH. Advances in neuroradiology: highlights of the 27th ANNUAL MEETING of the AMERICAN SOCIETY OF NEURORADIOLOGY, Orlando, March 19-24, 1989. *AJNR* 1989; 10:851-866.
45. Yousem DM, Janick PA, Atlas SW, Hackney DB, Glasser SA, Wehrli FW, Grossman RI: Pseudoatrophy of the cervical portion of the spinal cord on MR images: a manifestation of the truncation artifact? *AJNR* 1990; 11:373-377.
46. Atlas SW: Adult supratentorial tumors. *Semin Roentgenol* 1990; 25:130-154.
47. Atlas SW: Cerebral vascular diseases. *Curr Opin Radiol* 1990; 2:18-25.
48. Cross P, Atlas SW, Grossman RI: MR evaluation of brain iron in children with cerebral infarction. *AJNR* 1990; 11:341-348.
49. Atlas SW, Braffman BH, LoBrutto R, Elder D, Herlyn D: Human malignant melanomas with varying degrees of melanin content in nude mice: MR imaging, histopathology, and electron paramagnetic resonance. *J Comput Assist Tomogr* 1990; 14:547-554.
50. Bobman SA, Atlas SW, Listerud J, Grossman RI: Postoperative lumbar spine: Contrast enhanced chemical shift MR imaging. *Radiology* 1991; 179:557-562.
51. Yousem DM, Atlas SW, Goldberg HI, Grossman RI: Degenerative cervical spine foraminal narrowing: ultrathin, high resolution 3DFT gradient echo MR imaging. *AJNR* 1991; 12:229-236.
52. Milton WJ, Atlas SW, Lavi E, Mollman JE. Magnetic resonance imaging of Creutzfeldt-Jacob disease. *Ann Neurol* 1991; 29:438-440.
53. Gur RC, Mozley PD, Resnick SM, Gottlieb GL, Kohn M, Zimmerman R, Herman G, Atlas S, Grossman R, Beretta D, Erwin R, Gur RE. Gender differences in age effect on brain atrophy measured by magnetic resonance imaging. *Proc Natl Acad Sci (USA)* 1991; 88:2845-2849.
54. Yousem DM, Ihmeidan I, Quencer R, Atlas SW. Paradoxically decreased signal intensity on post-contrast short TR MR images. *AJNR* 1991; 12:875-880.
55. Standaert DG, Galetta SL, Atlas SW. Meningovascular syphilis with a gumma of the midbrain. *J Clin Neuroophthalmol* 1991; 11:139-143.

56. Milton WJ, Atlas SW, Lexa FJ, Mozley PD, Gur RE. Deep gray matter hypointensity patterns with aging in healthy adults: MR imaging at 1.5T. *Radiology* 1991; 181:715-719.
57. Seltzer S, Mark AS, Atlas SW. CNS sarcoidosis: evaluation with contrast-enhanced MR imaging. *AJNR* 1991; 12:1227-1233.
58. Menick BJ, Bobman SA, Listerud J, Atlas SW. Thin section, three dimensional Fourier transform, steady-state free precession MR imaging of the brain. *Radiology* 1992; 183:369-377.
59. Mark AS, Blake P, Atlas SW, Ross M, Brown D, Kolsky M. Gadolinium-DTPA enhancement of the cisternal portion of the oculomotor nerve on MR imaging. *AJNR* 1992;13:1463-1470.
60. Yousem DM, Atlas SW, Hackney DB. Cervical spine disk herniation: comparison of CT and 3DFT gradient echo MR scans. *JCAT* 1992; 16:345-351.
61. Galetta SL, Sergott RC, Wells GB, Atlas SW, Byrd S. Spontaneous remission of a third nerve palsy in meningeal lymphoma. *Ann Neurol* 1992; 32:100-102.
62. Jacobson M, Galetta SL, Atlas SW, Curtis M, Wulc A. Bipolaris-induced orbital cellulitis. *J Clin Neuroophthalmol* 1992;12:250-256.
63. Atlas SW. MR is highly sensitive for acute subarachnoid hemorrhage...*NOT!*. *Radiology* 1993;186:345-351.
64. Lexa FJ, Galetta SL, Yousem DM, Farber M, Oberholtzer JC, Atlas SW. Herpes zoster ophthalmicus with orbital pseudotumor syndrome complicated by optic nerve infarction and cerebral granulomatous angiitis: MR-pathologic correlations. *AJNR* 1993;14:185-190.
65. Atlas SW. Rationale and clinical indications for contrast agents in MR imaging of the brain and spine. *J Comput Assist Tomogr* 1993, 17 (suppl 1):S1-S7.
66. Gomori JM, Grossman RI, Asakura T, Schnall MD, Atlas SW, Holland G, Mittl R. An *in vitro* study of magnetization transfer and relaxation of hematoma. *AJNR* 1993; 14:871-880.
67. Mittl R, Gomori JM, Schnall M, Holland G, Grossman RI, Atlas SW. Magnetization transfer effects in MR imaging of *in vivo* intracranial hemorrhage. *AJNR* 1993; 14:881-891.
68. Atlas SW, Hackney DB, Listerud J. Fast spin echo imaging of the brain and spine. *Magn Reson Quart* 1993; 9:61-83.
69. Rosenfeld J, Taylor C, Atlas SW. Myelitis following chickenpox. *Neurology* 1993;43:1834- 1836.
70. Silverman I, Galetta SL, Gray LG, Moster M, Atlas SW, Maurer AH, Alavi A. SPECT in patients with cortical visual loss. *J Nucl Med* 1993;34:1447-1451.

71. Atlas SW, Bressler EL, Weinberg PE, Rogers LF. Roentgenographic evaluation of thinning of the lumbar pedicles. *Spine* 1993;18:1190-1192.
72. Raps EC, Galetta SL, Broderick M, Atlas SW. Delayed peripartum vasculopathy: cerebral eclampsia revisited. *Ann Neurol* 1993;33:222-225.
73. Mittl R, Broderik M, Carpenter J, Goldberg HI, Mishkin M, Berkowitz H, Atlas SW. Blinded reader comparison of magnetic resonance angiography and duplex ultrasonography for carotid artery bifurcation stenosis. *Stroke* 1994;25:4-10.
74. Yuh WTC, Fisher DJ, Runge VM, Atlas SW, Harms SE, Maravilla KR, Mayr NA, Mollman JE, Price AC. Phase III multicenter trial of high-dose gadoteridol in MR evaluation of brain metastases. *AJNR* 1994;15:1037-1051.
75. Yuh WTC, Nguyen, HD, Tali, ET, Mayr NA, Fisher DJ, Atlas SW, Carvlin, MC, Drayer BP, Pollei SR, Runge VM, Sze GK. Delineation of gliomas with various doses of gadoteridol. *AJNR* 1994;15:983-989.
76. Atlas SW, Listerud J, Chung W, Flamm E. Intracranial aneurysms: Depiction on MR angiograms with a multifeature extraction, ray tracing post-processing algorithm. *Radiology* 1994;192:129-139.
77. Atlas SW. MR angiography in neurologic disease: state-of-the-art. *Radiology* 1994; 193:1-16.
78. Kieper MD, Ng SES, Atlas SW, Grossman RI. Subcortical hemorrhage: marker for radiographically occult cerebral vein thrombosis on computed tomography of the brain. *JCAT* 1995;19:527-531.
79. D'Esposito M, Detre JA, Alsop DC, Shin RK, Atlas S, Grossman M. The neural basis of the central executive system of working memory. *Nature* 1995;378:279-281.
80. Atlas SW, Howard RS, Madjian J, Alsop DA, Detre JA, Listerud J, D'Esposito M, Judy K, Zager E, Stecker M. Functional magnetic resonance imaging of regional brain activity in patients with intracerebral gliomas: findings and implications for clinical management. *Neurosurgery* 1996;38:329-338.
81. Madjian J, Atlas SW, Howard RS, Alsop D, Detre DA, D'Esposito M, Listerud J, Flamm E. Functional magnetic resonance imaging of regional brain activity in patients with intracerebral arteriovenous malformations prior to surgical or endovascular therapy. *J Neurosurg* 1996;84:477-483.
82. Alsop DC, Detre JA, D'Esposito M, Howard RS, Maldjian JA, Grossman M, Listerud J, Flamm ES, Judy KD, Atlas SW. Functional activation during an auditory comprehension task in patients with temporal lobe lesions. *NeuroImage* 1996;4:55-59.



83. Atlas SW, Sheppard L, Goldberg HI, Hurst RW, Listerud J, Flamm E. Intracranial aneurysms: Detection and characterization with MR angiography with use of an advanced post processing technique in a blinded reader study. *Radiology* 1997;203:807-814.
84. Atlas SW. Magnetic resonance imaging of intracranial aneurysms. *Neuroimag Clin North Am* 1997; 7:709-720.
85. Singer M, Chong J, Lu D, Schonewille W, Tuhim S, Atlas SW. Diffusion weighted MRI in acute subcortical infarction. *Stroke* 1998;29:133-136.
86. Buchsbaum MS, Tang CY, Peled S, Gudbjartsson H, Lu D, Hazlett EA, Downhill J, Haznedar M, Atlas SW. Correlates between glucose metabolic rate and diffusion anisotropy in normals and schizophrenics. *NeuroReport* 1998;9:425-430.
87. Singer M, Atlas SW, Drayer BP. Subarachnoid space disease: diagnosis with fluid attenuated inversion recovery MR imaging and comparison with contrast-enhanced T1 weighted images: Blinded reader study. *Radiology* 1998;208:417-422
88. Chong J, Singer M, Lu D, Aragao F, Keller P, Silvers A, Tuhim S, Schonewille WJ, Atlas SW. Diffusion weighted MRI of acute infarction: Comparison of blinded readings using three orthogonal axis diffusion images, isotropic diffusion images, trace-weighted images, and trace images. *AJNR* 1998;19:1733-1739.
89. Atlas SW, Thulborn KR. MR detection of hyperacute parenchymal hemorrhage of the brain. *AJNR* 1998;19:1471-1507.
90. Nusbaum AO, Morgello S, Atlas SW. Pial involvement in Wegener's granulomatosis shown on MRI. *Neuroradiology* 1999;41:847-849.
91. Chong J, DiRocco A, Tagliati M, Danisi F, Simpson D, Atlas SW. MR findings in AIDS-associated myelopathy. *AJNR* 1999;20:1412-1416..
92. Schonewille WJ, Tuhim S, Singer MB, Atlas SW. Diffusion-weighted MRI in acute lacunar syndromes: a clinical-radiological correlation study. *Stroke* 1999;30:2066-2069.
93. Nusbaum AO, Lu D, Tang CY, Atlas SW. Quantitative diffusion measurements in focal multiple sclerosis lesions: correlations with appearance on T1-weighted MR images. *AJR Am J Roentgenol* 2000;175:821-825.
94. Nusbaum AO, Tang CY, Wei T, Buchsbaum MS, Atlas SW. Whole-brain diffusion MR histograms differ between MS subtypes. *Neurology* 2000;54:1421-7.
95. Atlas SW, DuBois P, Singer MB, Lu D. Diffusion measurements in intracranial hematomas: implications for MR imaging of acute stroke. *AJNR* 2000;21:1190-1194.
96. Desmond JE and Atlas SW. Task-correlated head movement in fMRI: False activations can contaminate results despite motion correction. *AJNR Am J Neuroradiol* 2000;2:1370-1371.



97. Wilson JD, Jacobs M, Shuer L, Atlas S, Horoupian DS. Idiopathic giant cell granulomatous hypophysitis. *Clin Neuropathol* 2000;19:300-304.
98. Nusbaum AO, Tang CY, Buchsbaum MS, Wei TC, Atlas SW. Regional and global changes in cerebral diffusion with normal aging. *AJNR Am J Neuroradiol.* 2001;22:136-42
99. Jones TR, Kaplan RT, Lane B, Atlas SW, and Rubin GD. Single- versus multi-detector row CT of the brain: quality assessment. *Radiology* 2001;219:750-5
100. Galaburda AM, Schmitt JE, Atlas SW, Eliez S, Bellugi U, Reiss AL. Dorsal forebrain anomaly in Williams syndrome. *Arch Neurol* 2001;58:1865-9.
101. Arnow BA, Desmond J, Banner L, Glover G, Solomon A, Lake Polan M, Lue T, Atlas SW. Brain activation and sexual arousal in healthy heterosexual males. *Brain* 2002;125:1014-23.
102. Kim BS, Illes J, Kaplan R, Reiss A, Atlas SW. Incidental findings on pediatric magnetic resonance imaging studies of the brain. *AJNR* 2002;23:1674-1677.
103. Bammer R, Herneth AM, Maier SE, Butts K, Prokesch RW, Do HM, Atlas SW, Moseley ME. Line scan diffusion MRI in spine disease. *AJNR* 2003;24:5-12.
104. Illes, J., Desmond, J., Huang, L.F., Raffin, T., Atlas SW. Ethical and practical considerations in managing incidental findings in functional magnetic resonance imaging. *Brain Cogn* 2002;50:358-365.
105. Atlas, SW. Subspecialty health care in the United States: More is better. *Hoover Weekly Essays and The Weekly Standard* February, 2003.
106. Illes, J., Fan, E., Koenig, B., Raffin, T.A., Kann D, Atlas, S.W. Self-referred Whole Body Imaging: Current Implications for Health Care Consumers. *Radiology* 2003; 228:346-351
107. Arzoumanian Y, Mirmiran M, Barnes PD, Woolley K, Ariagno RL, Moseley ME, Fleisher BE, , Atlas SW. Diffusion Tensor Brain Imaging Findings At Term-equivalent Age May Predict Neurologic Abnormalities in Low Birth Weight Preterm Infants. *AJNR Am J Neuroradiol* 2003;24:1646-1653.
108. ML Polan, J.E. Desmond, M.R. Pryor, L.L. Banner, S.W. McCallum, S.W. Atlas, G.H. Glover, B.A. Arnow. Female sexual arousal: behavioral analysis. *Fertil Steril* 2003;80:1480-1487.
109. E. Adelsteinsson, A. Langer-Gould, A. Pfefferbaum, E. Sullivan, A. Rao, S.W. Atlas Gray matter NAA deficits in secondary progressive but not relapsing remitting multiple sclerosis: quantification with volumetric MR spectroscopic imaging. *AJNR* 2003;24:1941-1945.
110. Illes, J. and Atlas, S.W. Emerging ethical issues in MRI, *TMRI* 2002;13:71-72.

111. Hobbs S, Shi G, Homer R, Harsh G, Atlas SW, Bednarski M. MRI guided proteomics in human glioblastoma multiforme. *JMRI* 2003;18:530-536.
112. SW Atlas Diagnosis: Critical. . *Hoover Digest* 2003;3:134-137.
113. Illes J, Rosen AC, Huang L, Goldstein RA, Raffin TA, Swan G, Atlas SW. Ethical consideration of incidental findings on adult brain MRI in research. *Neurology* 2004;62:888-90.
114. Baker LC and Atlas SW Relationship between HMO market share and the diffusion and use of advanced MRI technologies. *J Amer Coll Radiol* 2004;1:478-487.
115. Illes J, Kirschen MP, Karetsky K, Kelly M, Saha A, Desmond JD,. Raffin TA, Glover GH, Atlas SW. Discovery and Disclosure of Incidental Findings in Neuroimaging Research. *J Magn Reson Imaging*. 2004;20:743-7.
116. Illes J, Kann D, Karetsky K, Letourneau P, Raffin TA, Schraedley-Desmond P, Koenig BA, Atlas SW Advertising, patient decision making, and self-referral for computed tomographic and magnetic resonance imaging... *Arch Intern Med*. 2004;164:2406-8.
117. SW Atlas. Power to the Patient. *Hoover Digest* 2004;4:134-137.
118. Langer-Gould A, Atlas SW, Green AJ, Bollen AW, Pelletier D. Progressive multifocal leukoencephalopathy in a patient treated with natalizumab. *N Engl J Med*. 2005;353:375-81
119. Illes J, Atlas SW, Raffin TA. Imaging neuroethics for the imaging neurosciences. *Neuroscience Imag* 2005;1:5-17.
120. Illes J, Atlas SW. Risks and benefits of the new medical imaging enterprise. *Virtual Mentor (AMA)*. 2007;9:99-103.
121. Embracing subspecialization: the key to the survival of radiology; SW Atlas *J Amer Coll Radiol* 2007;4:752-753.
122. Expanded use of imaging technology and the challenge of measuring value; LC Baker, SW Atlas, C Afendulis. *Health Affairs* 2008; 27: 1467-1478.
123. Neonatal brain structure on MRI diffusion tensor imaging, sex, and neurodevelopment in very-low-birthweight preterm children, Rose J, Butler EE, Lamont LE, Barnes PD, Atlas SW, Stevenson DK , *Devel Med Child Neurol* 2009 April 21 (epub ahead of print)

124. Health insurance and catastrophic illness: a report on the New Cooperative Medical System in rural China; Hongmei Yi, Linxiu Zhang, Kim Singer, Scott Rozelle, Scott Atlas. *Health Economics* 2009;Jul;18 Suppl 2:S119-27.
125. Arterial spin label images in patients with normal bolus perfusion-weighted magnetic resonance imaging – pilot identification of the “borderzone sign”, Zaharchuk G, Bammer R, Straka M, Shankaranarayan A, Alsop DC, Fischbein NJ, Atlas SW, Moseley ME. *Radiology* 2009; 252:797-807.
126. Bilateral lipomas of the internal auditory canals. Goebel A, Kenny K, Atlas SW. *The Neuroradiology Journal* 2010;23:501-503.
127. Assessing cost-effectiveness and value as imaging grows: the case of carotid artery CT. LC Baker, C Afendulis, SW Atlas. *Health Affairs* 2010;29:2260-67.
128. Zeineh MM, Holdsworth S, Skare S, Atlas SW, Bammer R. Challenges of High Resolution Diffusion Imaging of the Human Medial Temporal Lobe in Alzheimer’s Disease. *Topics in Magnetic Resonance Imaging*, 2011;21(6):355-65.
129. Exposure to Ionizing Radiation and Estimate of Secondary Cancers in the Era of High Speed CT Scanning: Projections from the Medicare Population. AB Meer, PA Basu, LC Baker, SW Atlas. *Journal Amer Coll Radiol* 2012;9:245-250
130. Subdural Hematoma After An Epidural Blood Patch. LA Verduzco, SW Atlas, ET Riley. *Int J Obstetric Anesthesia* 2012;21:189-192.
131. Ultra-High Resolution Diffusion Tensor Imaging of the Microscopic Pathways of the Medial Temporal Lobe. M Zeineh, S Holdsworth, S Skare, SW Atlas, R Bammer. *NeuroImage* 2012;62:2065-82.
132. Right Arcuate Fasciculus Abnormality in Chronic Fatigue Syndrome. MM Zeineh, J Kang, SW Atlas, MM Raman, AL Reiss, JL Norris, I Valencia, JG Montoya. *Radiology* 2014; DOI: <http://dx.doi.org/10.1148/radiol.14141079>.

**Policy Essays:**

1. Subspecialty Health Care in the United States: More *Is* Better! SW Atlas. *Hoover Weekly Essays*, January 27, 2003; also published in *National Review*, *New Republic*, *The Weekly Standard*, and others.
2. Diagnosis: Critical. SW Atlas. *Hoover Digest* 2003;3:134-137.
3. When Patients Pay, Costs Come Down. SW Atlas. *Hoover Weekly Essays*, November 3, 2003; also published in *New Republic*, *The Weekly Standard*, and others.
4. Power to the Patient. SW Atlas. *Hoover Digest* 2004;4:134-137. (also published in *The Washington Times*, September 8, 2004)
5. Vouchers for Health Care? SW Atlas, *The Washington Times*, April 24, 2005
6. Whose Health Care Is It Anyway? SW Atlas. *Hoover Weekly Essays*, May 11, 2005; also published in *New Republic*, *The Weekly Standard*, and others.
7. Patients Progress. SW Atlas, *The Washington Times*, December 27, 2005
8. Doctor: Post Your Prices. SW Atlas, *The Wall Street Journal*, February 17, 2006  
*Hoover Digest* 2006;2:
9. Health Care for 1.5Billion People? Let the Markets Decide. SW Atlas, *The Wall Street Journal*, May 1, 2006
10. Health Insurance Winner. SW Atlas, *The Washington Times*, July 12, 2006
11. The Case for High Deductible Insurance. SW Atlas. *Hoover Digest* 2006;3:105-107.
12. Tipping the Scale: Moving Privatized Imaging from Risk to Benefit . Illes J, Atlas SW. *American Medical Association, Virtual Mentor* 2007;9:99-103.
13. Micro Plans for Macro Benefit; SW Atlas, *The Washington Times*, January 24, 2007

14. Tear Down Those Health Care Walls; SW Atlas, *The Washington Times*, March 9, 2007
15. Oh Canada, We Don't Want Your Health Care; SW Atlas, *Orange Country Register*, April 5, 2007
16. Progress By Small Steps; SW Atlas, *Hoover Digest*, Summer 2007;3:56-59.
17. Health Care Lies; SW Atlas, *Pittsburgh Tribune Review*, June 17, 2007
18. Managing the Health Care Myth; SW Atlas, *Hoover Digest*, Winter 2007;4,
19. ATLAS: Beware Obamacare; SW Atlas *Washington Times*, October 26, 2008
20. Pardon the Interruption; SW Atlas *Washington Times*, February 18, 2009
21. Should healthcare be nationalized?; Scott W. Atlas *FoxNews.com*, April 10, 2009
22. Alternatives to nationalized health care; Gov. M. Sanford and Scott W. Atlas *Washington Times*, June 15, 2009
23. Why Americans Should Care About Crowd Out and Mandates; Scott W. Atlas *FoxNews.com*, June 29, 2009
24. Here's a Second Opinion; Scott W. Atlas *Hoover Digest*, Summer 2009; 3.
25. Rationing Health Care; Scott W. Atlas *Forbes*, July 21, 2009
26. Looking Beyond the Public Option; Scott W. Atlas *Forbes*, August 19, 2009
27. The Power of the Patient; Scott W. Atlas *FoxNews.com*, August 24, 2009
28. Mr. Health Care; Scott W. Atlas *Forbes*, August 26, 2009

29. Why Are These Health Care Fixes Ignored?; Scott W. Atlas  
*Forbes*, September 8, 2009
30. Inside the Baucus Plan; Scott W. Atlas  
*Forbes*, October 12, 2009
31. Where's the Benefit?; Scott W. Atlas  
*Washington Times*, October 25, 2009
32. Health Care Reform: Cancel the Code Blue; Scott W. Atlas  
*Hoover Digest*, Fall 2009; 4.
33. Research gains at risk. Bureaucrats to dim use of advanced imaging? Scott W. Atlas  
*Washington Times*, November 15, 2009
34. By Reason of Insanity; Scott W. Atlas  
*FoxNews.com*, December 10, 2009
35. Commonsense Health-Care Reforms. Scott W. Atlas  
*National Review*, December 14, 2009
36. No More Entitlements; Scott W. Atlas  
*Forbes*, April 20, 2010
37. Obamacare: The Sequel; Scott W. Atlas  
*Washington Times*, September 18, 2010
38. The Ignored Facts of American Healthcare; Scott W. Atlas  
*Defining Ideas*, December 13, 2010
39. Don't Tweak Obamacare, Repeal It; Scott W. Atlas  
*Forbes*, December 14, 2010
40. Poison Pill; Scott W. Atlas  
*Hoover Digest*, Winter 2011, Number 1; January 12, 2011
41. Obamacare Under Attack: Is It Time to Eliminate Government Health Insurance?; Scott W. Atlas  
*National Review Online*, January 17, 2011
42. The Disregarded Options of American Health Care; Scott W. Atlas  
*Defining Ideas*, February 6, 2011
43. The Worst Study Ever?; Scott W. Atlas  
*Commentary Magazine*, April, 2011

44. Infant Mortality: A Deceptive Statistic; Scott W. Atlas  
*National Review Online*, September 14, 2011
45. Another view: Misleading neonatal data distort rankings; Scott W. Atlas  
*USA Today*, October 4, 2011
46. The Ignored Facts of American Healthcare; Scott W. Atlas  
*Defining Ideas*, December 13, 2010
47. Survival of the Smallest; Scott W. Atlas  
*Hoover Digest*, Winter 2012, Number 1; January 23, 2012
48. The Car Insurance Model; Scott W. Atlas  
*Defining Ideas*, February 2, 2012
49. ObamaCare Is At the Core of the President's War on Excellence; Scott W. Atlas  
*Investor's Business Daily*, February 16, 2012
50. Striking "Obamacare" a Rejection of Overreach; Scott W. Atlas  
*Politico*, March 12, 2012
51. The Picture of Health; Scott W. Atlas  
*Hoover Digest*; 2012, No. 2, April 6, 2012
52. Obama policies threaten the most vulnerable:  
Obamacare imperils America's women; Scott W. Atlas  
*Washington Times*, May 1, 2012
53. The Supreme Court's Obamacare Calamity Calls for New, Truthful Leadership; Scott W. Atlas  
*Forbes*, July 25, 2012
54. Where's the Outrage From Young Americans About Obama's Health Reforms?;  
Scott W. Atlas  
*Forbes*, July 31, 2012
55. Obesity and Responsibility; Scott W. Atlas  
*Philadelphia Inquirer*, August 1, 2012
56. A Ballot-Box Prescription; Scott W. Atlas  
*Hoover Digest*; 2012, No. 3, August 13, 2012
57. How to Save America's Health Care Safety Net; Scott W. Atlas  
*Forbes*, August 20, 2012
58. The Moral Case for Romneycare 2.0; Scott W. Atlas  
*Defining Ideas*, August 29, 2012

59. The Liberal Media's Erroneous Indictment of U.S. Health Care: There They Go Again...; Scott W. Atlas  
*Forbes*, September 17, 2012
60. The Unraveling of Obamacare; Scott W. Atlas  
*Forbes*, October 2, 2012
61. What Do Actual Doctors Think About Obamacare Now? ; Scott W. Atlas  
*Forbes*, October 11, 2012
62. IPAB: President Obama's NICE Way to Ration Care To Seniors; Scott W. Atlas  
*Forbes*, October 21, 2012
63. Obesity and Responsibility; Scott W. Atlas  
*Hoover Digest*; 2012, No. 4, October 26, 2012
64. The Republicans' "War On Women" Is a Fiction Of The Liberal Media Elite; Scott W. Atlas  
*Forbes*, November 2, 2012
65. A Pyrrhic Victory for America's Youth; Scott W. Atlas  
*National Review Online*, November 12, 2012
66. What the World Doesn't Know About Health Care in America; Scott W. Atlas  
*FoxNews.com*, November 16, 2012
67. The Democrats' Fallback Plan For When Obamacare Inevitably Fails; Scott W. Atlas  
*Forbes*, November 25, 2012
68. Let's Be Honest - Medicare is Insolvent And Doctors Soon Won't Accept It; Scott W. Atlas  
*Forbes*, December 18, 2012
69. Obesity: The New "Just Say No" For 2013; Scott W. Atlas  
*Forbes*, January 9, 2013
70. Facts About America's Health Care Quality That The World Doesn't Know; Scott W. Atlas  
*FoxNews.com*, January 15, 2013
71. Rationing by Another Name; Scott W. Atlas  
*Hoover Digest*; 2012, No. 1, January 25, 2013
72. The Era Of Mandates: President Obama's Unfortunate Legacy; Scott W. Atlas  
*Forbes*, January 29, 2013



73. Voters Still Support GOP Healthcare Principles, But Will This Matter In The 2014 Elections? ; Scott W. Atlas  
*Forbes*, February 12, 2013

74. With Better Healthcare in Mind, Americans Should Demand Medicare Reforms;  
Scott W. Atlas  
*Forbes*, March 10, 2013

75. When Is an Insurance Exchange Not a Marketplace? ; Scott W. Atlas  
*Yahoo! Finance*, March 20, 2013

76. The Free-Market Cure; Scott W. Atlas  
*Hoover Digest*; 2013, No. 2, April 26, 2013

77. The Disconnect of Health Secretary Kathleen Sebelius; Scott W. Atlas  
*Forbes*, April 30, 2013

78. The Truth about Medicaid Reform; Scott W. Atlas  
*USA Today*, May 15, 2013

79. Will The Obama Administration Play Dumb On ObamaCare, Too?; Scott W. Atlas  
*Forbes.com*, May 28, 2013

80. Consumer Choice – It Works; Scott W. Atlas  
*Hoover Digest*; 2013, No. 3, July 1, 2013

81. Happy Birthday To Great Britain's Increasingly Scandalous National Health Service; Scott W. Atlas  
*Forbes.com*, July 5, 2013

82. How Republicans Can Save Obama's Misleadingly Named Affordable Care Act;  
Scott W. Atlas  
*Forbes.com*, August 12, 2013

83. When It Comes To Obamacare, Ignorance Is Bliss For Young Americans; Scott W. Atlas  
*Forbes.com*, August 28, 2013

84. Obamacare's Supporters Are Living In The Past, Which Is Where Healthcare Quality Will Remain; Scott W. Atlas  
*Forbes.com*, September 22, 2013

85. Medicare on Life Support; Scott W. Atlas  
*Hoover Digest*, 2013 No. 4, October 18, 2013

86. Obamacare's Majestic Failure Is About Much More Than 'Glitches'; Scott W. Atlas  
*Forbes.com*, October 24, 2013

87. Obamacare Is Misguided: Let's Prioritize Specialist Care and Technology; Scott W. Atlas  
*Yahoo! Finance*, November 6, 2013

88. On Thanksgiving, Let's Be Thankful For What Remains Of America's Healthcare; Scott W. Atlas  
*Forbes.com*, November 28, 2013

89. Exposing The World's Great Lie About ObamaCare and Socialized Medicine; Scott W. Atlas  
*FoxNews.com*, January 3, 2014

90. It's Time to Rethink Health Insurance; George P. Shultz, Scott W. Atlas, John F. Cogan  
*Los Angeles Times*, January 6, 2014

91. The Doctor Won't See You Now; Scott W. Atlas  
*Hoover Digest*, No. 1, Tuesday, January 21, 2014

92. Why Is The Public Being Stonewalled On Serious ObamaCare Fixes?; Scott W. Atlas  
*Forbes.com*, January 26, 2014

93. When Will the Backlash Occur?; Scott W. Atlas  
*FoxNews.com*, February 18, 2014

94. Would Hillary Clinton Give Us Worse Than ObamaCare?; Scott W. Atlas  
*Investor's Business Daily*, March 11, 2014

95. Single Payer Is Inevitably Hillary Clinton's Unwise Fix For Obamacare; Scott W. Atlas  
*Forbes.com*, March 28, 2014

96. A Policy Too Far; George P. Shultz, Scott W. Atlas, and John F. Cogan  
*Hoover Digest*; 2014, No. 2, April 21, 2014

97. Measuring the Success of Obamacare: Don't Be Misled; Scott W. Atlas  
*Real Clear Politics*, April 22, 2014

98. The Coming Two-Tier Health System; Scott W. Atlas  
*Wall Street Journal*, April 30, 2014

99. The Surprising International Consensus on Healthcare; Scott W. Atlas  
*Defining Ideas*, June 19, 2014

100. Where ObamaCare is Going; Scott W. Atlas  
*Wall Street Journal*, August 13, 2014
101. ObamaCare's Anti-Innovation Effect; Scott W. Atlas  
*Wall Street Journal*, October 1, 2014
102. Waiting for Dr. Godot; Scott W. Atlas  
*Hoover Digest*, 2014, No. 4, Fall, October 21, 2014
103. Congress and ObamaCare: What to expect next; Scott W. Atlas  
*FoxNews.com*, November 14, 2014
104. If You Like Choice in Health Care, Look To Republicans; Scott W. Atlas  
*CNN.com*, November 18, 2014
105. The Obamacare Election; Scott W. Atlas  
*Defining Ideas*, January 7, 2015
106. Take Care to Innovate; Scott W. Atlas  
*Hoover Digest*, 2015, No. 1, Winter, January 28, 2015
107. How Obamacare Fails the Poor and Middle Class; Scott W. Atlas  
*CNN.com*, March 4, 2015
108. Medicare Disadvantage; Scott W. Atlas  
*Hoover Digest*, 2015, No. 2, Spring, April 20, 2015
109. Repairing The ObamaCare Wreckage; Scott W. Atlas  
*Wall Street Journal*, June 28, 2015
110. Two Essential Tools For Repairing The Obamacare Damage; Scott W. Atlas and John F. Cogan  
*Wall Street Journal*, September 1, 2015
111. Restoring Quality Health Care: A Six Point Plan for Comprehensive Reform at Lower Cost; Scott W. Atlas  
*Real Clear Politics/Health*, November 9, 2015
112. Under Obamacare, Hospitals Merge, Doctors Merge, and Patients Pay More for Less; Scott W. Atlas  
*National Review Online*, November 25, 2015
113. Rescuing ObamaCare; Scott W. Atlas and John F. Cogan  
*Hoover Digest*, Winter, 2016
114. How To Fix The Scandal Of Medicaid And The Poor; Scott W. Atlas  
*Wall Street Journal*, March 15, 2016

115. Better Ideas, Stat; Scott W. Atlas  
*Hoover Digest*, Spring, 2016
116. The Impending Disaster of Health Care Supply; Scott W. Atlas  
*Investors Business Daily*, April 29, 2016
117. The Myth of Medicare's Excellence, and How to Fix It; Scott W. Atlas  
*Real Clear Politics/Health*, April 29, 2016
118. The Right Cure to Health Care; Scott W. Atlas  
*Defining Ideas*, May 17, 2016
119. How Medicaid Fails The Poor; Scott W. Atlas  
*Wall Street Journal*, August 10, 2016
120. What's Wrong With Health Insurance In America?; Scott W. Atlas  
*Policyed.org*, November 16, 2016
121. Medical Technology: A Key to Health Care Excellence and Cost Saving; Scott W. Atlas  
*Real Clear Politics/Health*, November 22, 2016
122. Giving Patients Control Over Their Health Care; Scott W. Atlas  
*Policyed.org*, November 22, 2016
123. Replace Obamacare With A System That Cuts Costs And Values Quality Care; Scott W. Atlas  
*CNN*, December 27, 2016
124. What Should California Expect from TrumpCare? Here Are Five Predictions for the Coming Rx; Scott W. Atlas  
*Eureka*, January 19, 2017
125. Policyed Office Hours: The Scholar Responds; Scott W. Atlas  
*Policyed.org*, February 22, 2017
126. How To Cut The Price Of Prescription Drugs; Scott W. Atlas  
*CNN*, April 20, 2017
127. Health Care And Health Insurance Are Not The Same Thing - The Fundamental Disconnect In Health Care Reform; Scott W. Atlas  
*FoxNews*, June 29, 2017
128. Mythbusting Health Care; Scott W. Atlas  
*Hoover Digest*, Summer; July 7, 2017
129. Fact-Based Health Care Reform; Scott W. Atlas  
*The American Interest*, August 2, 2017

130. Transformational Health Care Reform; Scott W. Atlas  
*Policyed.org*, August 3, 2017
131. Survival Of ObamaCare Is Nothing To Celebrate; Scott W. Atlas  
*Fox News*, August 5, 2017
132. Why Single Payer Health Care Is A Terrible Option; Scott W. Atlas  
*CNN*, September 25, 2017
133. The Health Reform That Hasn't Been Tried; Scott W. Atlas  
*Wall Street Journal*, October 4, 2017
134. President Trump is Right: Less Regulation And More Incentives Are The Right Path For Health Care Reform; Scott W. Atlas  
*Fox News*, October 12, 2017
135. Single-Payer Health Care Is A Terrible Option; Scott W. Atlas  
*Defining Ideas*, October 24, 2017
136. The Path To Affordable Health Care; Scott W. Atlas  
*Defining Ideas*, November 30, 2017
137. The Reform Less Traveled; Scott W. Atlas  
*Hoover Digest*, winter; January 26, 2018
138. Aggressive Deregulation Is The Key For Competition-Based, Health-Care Reform; Scott W. Atlas  
*The Hill*, March 19, 2018
139. Soaring Drug Prices? Here's How To Control Them; Scott W. Atlas  
*CNN*, March 21, 2018
140. An Overlooked Key to Lower Drug Prices; Scott W. Atlas  
*Defining Ideas*, April 4, 2018
141. Health Savings Accounts For Everyone; Scott W. Atlas  
*Wall Street Journal*, June 19, 2018
141. Clearing Up Misconceptions About Health Savings Accounts; Scott W. Atlas  
*Defining Ideas*, July 3, 2018
141. Bottling Up Drug Prices; Scott W. Atlas  
*Hoover Digest*, July 9, 2018
142. Americans Are "Winning" On Health Care As Trump Administration Chips Away At ObamaCare; Scott W. Atlas  
*Fox News*, August 6, 2018

143. Health Care Policy Reform; Scott W. Atlas  
*Economic Policy Challenges Facing California's Next Governor*, Hoover Institution,  
October 29, 2018

144. Savings for All; Scott W. Atlas  
*Hoover Digest*; October 29, 2018

145. The Most Misunderstood Part Of Health Reform; Scott W. Atlas  
*Washington Times*, October 31, 2018

146. The False Promise Of 'Medicare For All'; Scott W. Atlas  
*The Wall Street Journal*, November 12, 2018

147. Perspectives On Policy: Lowering The Cost Of Health Care; Scott W. Atlas  
*PolicyEd*, December 5, 2018

148. Single Payer's Misleading Statistics; Scott W. Atlas  
*The Wall Street Journal*, December 17, 2018

149. Transformational Health Care Reform; Scott W. Atlas  
*PolicyEd*, December 18, 2018

150. Health Insurance; Scott W. Atlas, Michael J. Boskin, Tom Church, John H. Cochrane , John F. Cogan, Daniel Heil, Daniel P. Kessler, John B. Taylor  
*PolicyEd*, December 20, 2018

151. Lean, Healthy Coverage; Scott W. Atlas  
*Hoover Digest*; January 25, 2019

152. How To Reduce Prescription-Drug Prices: First, Do No Harm; Scott W. Atlas  
*The Wall Street Journal*, February 13, 2019

153. No Free Lunch— Or Health Care; Scott W. Atlas  
*Hoover Digest*, April 24, 2019

154. The Conservative Case For Health Care; Scott W. Atlas  
*Washington Times*, May 22, 2019

155. Shop Till Medical Costs Drop; Scott W. Atlas  
*Wall Street Journal*, June 6, 2019

156. Public Option Kills Private Insurance; Scott W. Atlas  
*Wall Street Journal*, July 16, 2019

157. The Fraud of Single-Payer Health Care; Scott W. Atlas  
*Washington Times*, July 24, 2019

158. Trump's Push To Make Health Care Prices More Transparent Is Long Overdue;  
Scott W. Atlas  
*CNN Business*, August 19, 2019

159. "Free" Health Care Isn't;  
by Scott W. Atlas  
Hoover Digest, October 9, 2019

160. Proposals To Achieve Universal Health Care Coverage  
Scott W. Atlas  
Subcommittee on Health of the Committee on Energy and Commerce  
December 10, 2019

161. The Dangers Of Medicare For All  
Scott W. Atlas  
*The New York Times*, March 9, 2020

162. How To Reduce Prescription Drug Prices: First, Do No Harm  
Scott W. Atlas  
*Missouri Medicine*, March 12, 2020

163. Widespread Isolation And Stopping All Human Interaction Will Not Eradicate  
COVID-19  
Scott W. Atlas  
*The Washington Times*, March 26, 2020

164. The Case For Optimism  
Scott W. Atlas  
*The Hill*, April 1, 2020

165. Reentry After The Panic: Paying The Health Price Of Extreme Isolation  
Scott W. Atlas  
*The Hill*, April 14, 2020

166. A Case for Optimism  
Scott W. Atlas  
*Hoover Digest*, April 20, 2020

167. The Data Is In — Stop The Panic And End The Total Isolation  
Scott W. Atlas  
*The Hill*, April 22, 2020

168. Science Says: It's Time To Start Easing The Lockdowns  
Scott W. Atlas  
*New York Post*, April 26, 2020

169. Relying On Foreign Drugs Is Dangerous  
Scott W. Atlas and H. R. McMaster  
*The Wall Street Journal*, April 28, 2020

170. How To Reopen Society Using Medical Science And Logic  
Scott W. Atlas  
*The Hill*, May 3, 2020

171. COVID-19: How New Information Should Drive Policy  
Scott W. Atlas  
U.S. Senate Committee on Homeland Security & Governmental Affairs  
May 6, 2020

172. Adding to Dr. Fauci's diagnosis: The critical case for ending our shutdown  
Scott W. Atlas  
*The Hill*, May 18, 2020

173. The COVID-19 shutdown will cost Americans millions of years of life  
Scott W. Atlas, John R. Birge, Ralph L Keeney and Alexander Lipton  
*The Hill*, May 25, 2020

174. Science says: 'Open the schools'  
Scott W. Atlas, Paul E. Peterson  
*The Hill*, June 1, 2020

#### **Chapters:**

1. "The Orbit", Scott W. Atlas, Robert A. Zimmerman, Larissa T. Bilaniuk; in S. Lee and K. Rao (eds.), Cranial Computed Tomography and MRI, 2nd edition, McGraw-Hill, New York, 1987.
2. "The Orbit", Scott W. Atlas, Larissa T. Bilaniuk, Robert A. Zimmerman; pages 570-613, in Magnetic Resonance Imaging, D. Stark and W. Bradley, editors, C.V. Mosby Company, Inc., St. Louis, 1987.
3. "The Orbit and Visual System", Scott W. Atlas and Steven L. Galetta; pages 709-794, in Magnetic Resonance Imaging of the Brain and Spine, Scott W. Atlas, editor, Raven Press, New York, 1991.
4. "Intraaxial Brain Tumors", Scott W. Atlas; pages 223-326, in Magnetic Resonance Imaging of the Brain and Spine, Scott W. Atlas, editor, Raven Press, New York, 1991.
5. "Fast Imaging: Principles, Techniques and Clinical Applications", Felix Wehrli and Scott W. Atlas; pages 1013-1078, in Magnetic Resonance Imaging of the Brain and Spine, Scott W. Atlas, editor, Raven Press, New York, 1991.
6. "Intracranial Hemorrhage", Keith Thulborn and Scott W. Atlas; pages 175-224, in Magnetic Resonance Imaging of the Brain and Spine, Scott W. Atlas, editor, Raven Press, New York, 1991.



7. "Intracranial Vascular Malformations and Aneurysms", Scott W. Atlas; pages 379-410, in Magnetic Resonance Imaging of the Brain and Spine, Scott W. Atlas, editor, Raven Press, New York, 1991.
8. "The Aging Brain and Neurodegenerative Disorders", Bruce H. Braffman, John Q. Trojanowski, and Scott W. Atlas; pages 567-624, in Magnetic Resonance Imaging of the Brain and Spine, Scott W. Atlas, editor, Raven Press, New York, 1991.
9. "MR Artifacts", Peter Joseph and Scott W. Atlas; pages 109-128, in Magnetic Resonance Imaging of the Brain and Spine, Scott W. Atlas, editor, Raven Press, New York, 1991.
10. "Flow: Theory and MR Techniques", John Listerud, Scott W. Atlas, Leon Axel; pages 49-68, in Magnetic Resonance Imaging of the Brain and Spine, Scott W. Atlas, editor, Raven Press, New York, 1991.
11. "The Orbit", Scott W. Atlas; in Magnetic Resonance Imaging, 2nd edition, D. Stark and W. Bradley, editors, C.V. Mosby Company, Inc., St. Louis, 1992.
12. "The Orbit and Visual System", Scott W. Atlas and Steven L. Galetta; pages 1007-1092, in Magnetic Resonance Imaging of the Brain and Spine, 2nd edition, Scott W. Atlas, editor, Lippincott-Raven Publishers, Philadelphia-New York, 1996.
13. "Intraaxial Brain Tumors", Scott W. Atlas and Ehud Lavi; pages 315-422, in Magnetic Resonance Imaging of the Brain and Spine, 2nd edition, Scott W. Atlas, editor, Lippincott-Raven Publishers, Philadelphia-New York, 1996.
14. "Fast Imaging: Principles, Techniques and Clinical Applications", Felix Wehrli and Scott W. Atlas; pages 1413-1500, in Magnetic Resonance Imaging of the Brain and Spine, 2nd edition, Scott W. Atlas, editor, Lippincott-Raven Publishers, Philadelphia-New York, 1996.
15. "Intracranial Hemorrhage", Keith Thulborn and Scott W. Atlas; pages 265-314, in Magnetic Resonance Imaging of the Brain and Spine, 2nd edition, Scott W. Atlas, editor, Lippincott-Raven Publishers, Philadelphia-New York, 1996.
16. "Intracranial Vascular Malformations and Aneurysms", Scott W. Atlas and Robert Hurst; pages 489-556, in Magnetic Resonance Imaging of the Brain and Spine, 2nd edition, Scott W. Atlas, editor, Lippincott-Raven Publishers, Philadelphia-New York, 1996.
17. "The Aging Brain and Neurodegenerative Diseases", Frank J. Lexa, John Q. Trojanowski, Bruce H. Braffman, and Scott W. Atlas; pages 803-870, in Magnetic Resonance Imaging of the Brain and Spine, 2nd edition, Scott W. Atlas, editor, Lippincott-Raven Publishers, Philadelphia-New York, 1996.
18. "Artifacts", Peter M. Joseph and Scott W. Atlas; pages 149-178, in Magnetic Resonance Imaging of the Brain and Spine, 2nd edition, Scott W. Atlas, editor, Lippincott-Raven Publishers, Philadelphia-New York, 1996.

19. "Fundamentals of Flow and Hemodynamics", John Listerud and Scott W. Atlas; pages 65-88, in Magnetic Resonance Imaging of the Brain and Spine, 2nd edition, Scott W. Atlas, editor, Lippincott-Raven Publishers, Philadelphia-New York, 1996.
20. "Extraaxial Brain Tumors", Herbert I. Goldberg, Ehud Lavi, and Scott W. Atlas; pages 423-488, in Magnetic Resonance Imaging of the Brain and Spine, 2nd edition, Scott W. Atlas, editor, Lippincott-Raven Publishers, Philadelphia-New York, 1996.
21. "The Orbit", Scott W. Atlas; in Magnetic Resonance Imaging, 3rd edition, D. Stark and W. Bradley, editors, C.V. Mosby Company, Inc., St. Louis, 1999.
22. "Cerebral Neoplastic Diseases: Metastatic Intraaxial Neoplasia", AS Nusbaum and SW Atlas; Current Protocols in Magnetic Resonance Imaging, M Haacke, editor; Wiley and Sons, New York, 2000.
23. "Cerebral Neoplastic Diseases: Metastatic Extraaxial Neoplasia", AS Nusbaum and SW Atlas; Current Protocols in Magnetic Resonance Imaging, M Haacke, editor; Wiley and Sons, New York, 2000.
24. "Cerebral Neoplastic Diseases: Intraaxial Primary Brain Tumors", AS Nusbaum and SW Atlas; Current Protocols in Magnetic Resonance Imaging, M Haacke, editor; Wiley and Sons, New York, 2000.
25. "Cerebral Neoplastic Diseases: Extraaxial Brain Tumors", AS Nusbaum and SW Atlas; Current Protocols in Magnetic Resonance Imaging, M Haacke, editor; Wiley and Sons, New York, 2000.
26. "Cerebral Neoplastic Diseases: Monitoring Tumor Therapy", AS Nusbaum and SW Atlas; Current Protocols in Magnetic Resonance Imaging, M Haacke, editor; Wiley and Sons, New York, 2000.
27. "Intraaxial Brain Tumors", Scott W. Atlas, Paul Fisher, and Ehud Lavi, in Magnetic Resonance Imaging of the Brain and Spine, 3rd edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2002.
28. "White Matter Disease and Inherited Metabolic Disorders", Annette O. Nusbaum and Scott W. Atlas, in Magnetic Resonance Imaging of the Brain and Spine, 3rd edition, Scott W. Atlas, editor, Lippincott-Raven Publishers, Philadelphia-New York, 2002.
29. "Intracranial Hemorrhage", Scott W. Atlas and Keith Thulborn, in Magnetic Resonance Imaging of the Brain and Spine, 3rd edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2002.
30. "Intracranial Vascular Malformations and Aneurysms", Scott W. Atlas and Huy Do, in Magnetic Resonance Imaging of the Brain and Spine, 3rd edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2002.

31. " Artifacts", Peter M. Joseph and Scott W. Atlas, in Magnetic Resonance Imaging of the Brain and Spine, 3rd edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2002.
32. "Extraaxial Brain Tumors", Scott W. Atlas, Ehud Lavi, and Herbert I. Goldberg, in Magnetic Resonance Imaging of the Brain and Spine, 3rd edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2002.
33. "The Orbit and Visual System", Mahmood Mafee, Scott W. Atlas and Steven L. Galetta; in Magnetic Resonance Imaging of the Brain and Spine, 3<sup>rd</sup> edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2002.
34. "Normal Aging, Dementia, and Neurodegenerative Disease", Clifford R. Jack, Jr., Frank J. Lexa, John Q. Trojanowski, Bruce H. Braffman, and Scott W. Atlas; in Magnetic Resonance Imaging of the Brain and Spine, 4<sup>th</sup> edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2009.
35. "Power to the Patient: The Right Choice to Control Health Care Costs", Atlas SW, pages 1-15; in Power to the Patient: Selected Health Care Issues and Policy Solutions; Scott W. Atlas, editor, Hoover Institution Press, Stanford, 2005.
36. "White Matter Disease and Inherited Metabolic Disorders", Annette O. Nusbaum, Otto Rapalino, Kar-Ming Fung, and Scott W. Atlas, in Magnetic Resonance Imaging of the Brain and Spine, 4<sup>th</sup> edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2009
37. "Intracranial Hemorrhage", Scott W. Atlas and Keith Thulborn, in Magnetic Resonance Imaging of the Brain and Spine, 4<sup>th</sup> edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2009.
38. "Intracranial Vascular Malformations and Aneurysms", Scott W. Atlas and Huy Do, in Magnetic Resonance Imaging of the Brain and Spine, 4<sup>th</sup> edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2009
39. " Artifacts", Peter M. Joseph and Scott W. Atlas, in Magnetic Resonance Imaging of the Brain and Spine, 4<sup>th</sup> edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2009.
40. "The Orbit and Visual System", Pamela Van Tassel, Mahmood Mafee, Scott W. Atlas and Steven L. Galetta; in Magnetic Resonance Imaging of the Brain and Spine, 4<sup>th</sup> edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2009.
41. "Normal Aging, Dementia, and Neurodegenerative Disease", Clifford R. Jack, Jr., Frank J. Lexa, John Q. Trojanowski, Bruce H. Braffman, and Scott W. Atlas; in Magnetic Resonance Imaging of the Brain and Spine, 4<sup>th</sup> edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2009.

42. "American Health Care: Ignored Facts and Disregarded Options", Scott W. Atlas; in Reforming America's Health Care System: The Flawed Vision of ObamaCare, Scott W. Atlas, editor, Hoover Press, Stanford, 2010.

43. "Intracranial Hemorrhage", Scott W. Atlas and Keith Thulborn, in Magnetic Resonance Imaging of the Brain and Spine, 5<sup>th</sup> edition, Scott W. Atlas, editor, Wolters-Kluwer Publishers, Philadelphia-New York, 2016.

**Editor of Journals, Journal Supplements, Special Issues, CDs:**

1. *Gadolinium Contrast Agents in Neuro-MRI*, Scott W. Atlas and Robert Brasch, editors. *J Comput Assist Tomogr* 1993, 17(Suppl 1),

2. *MRI of the Brain and Spine on CD-ROM*, Scott W. Atlas, Lippincott-Raven Press, Philadelphia-New York, 1998.

3. *MRI of the Brain and Spine on CD-ROM*, Scott W. Atlas, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2003.

4. *Emerging Ethical Issues in MRI*; J. Illes and S.W. Atlas, Issue Editors. *TMRI* 2002;13.

5. *Clinical MRI at 3T*; SW Atlas, R Herfkens, V Runge, Guest Editors. *Investigative Radiology* 2006;41.

**Books (10):**

1. Magnetic Resonance Imaging of the Brain and Spine, Scott W. Atlas, editor, Raven Press, New York, 1991.

2. Magnetic Resonance Imaging of the Brain and Spine, 2nd edition, Scott W. Atlas, editor, Lippincott-Raven Press, Philadelphia-New York, 1996.

3. Magnetic Resonance Imaging of the Brain and Spine, 3rd edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2002.

4. Pocket Atlas of Cranial MR, 2nd edition, Scott W. Atlas and Richard Kaplan, Lippincott Williams & Wilkins Publishers, Philadelphia-New York, 2002.

5. Power to the Patient: Selected Health Care Issues and Policy Solutions; Scott W. Atlas, editor, Hoover Institution Press, Stanford, 2005.

6. Magnetic Resonance Imaging of the Brain and Spine, 4<sup>th</sup> edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins; Wolters-Kluwer Publishers, Philadelphia-New York, 2009.

7. Reforming America's Health Care System: The Flawed Vision of ObamaCare, Scott W. Atlas, editor, Hoover Press, Stanford, 2010.

8. In Excellent Health: Setting the Record Straight on America's Health Care, Scott W. Atlas, Hoover Press, Stanford, 2011.

9. Restoring Quality Health Care: A Six Point Plan for Comprehensive Reform at Lower Cost, Scott W. Atlas, Hoover Press, Stanford, 2016.

10. Magnetic Resonance Imaging of the Brain and Spine, 5<sup>th</sup> edition, Scott W. Atlas, editor, Lippincott Williams & Wilkins; Wolters-Kluwer Publishers, Philadelphia-New York, 2016.

11. Restoring Quality Health Care: A Six Point Plan for Comprehensive Reform at Lower Cost, 2<sup>nd</sup> edition, Scott W. Atlas, Hoover Press, Stanford, 2020 (in press).

**Scientific Abstracts at Refereed Meetings:**

1. Ultrasonic Diagnosis of Agenesis of the Corpus Callosum. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 69TH SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1983. (Shkolnik A, Atlas S, Naidich T).
2. Intraoperative Neurosurgery in Pediatrics. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 69TH SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1983. (Atlas S, Shkolnik A, McClone D).
3. Intraoperative Ultrasonography of the Pancreas. AMERICAN ROENTGEN RAY SOCIETY, 84TH ANNUAL MEETING, Las Vegas NV, April 1984. (Smith S, Vogelzang R, Atlas S, Donovan J, Vrla R, Deschler T, Neiman H); same title as poster (Atlas S, Vogelzang R, Smith S, Donovan J, Vrla R, Deschler T, Neiman H).
4. Intraoperative Neurosurgery in Pediatrics. AMERICAN SOCIETY OF NEURORADIOLOGY, 1984 ANNUAL MEETING, Boston, Massachusetts, May 1984. (Atlas S, Shkolnik A, McClone D).
5. Cervical Cord Trauma in Patients with Cervical Spondylosis. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 70TH SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Washington, D.C., November 1984. (Regenbogen V, Atlas S, Rogers L, Kim K).
6. The Radiographic Characterization of Burst Fractures of the Spine. AMERICAN ROENTGEN RAY SOCIETY, 85TH ANNUAL MEETING, Boston, MA, April 1985. (Atlas S, Regenbogen V, Rogers L, Kim K); poster (Atlas S, Regenbogen V, Rogers L, Kim K).
7. MR of Developmental Anomalies of the Corpus Callosum and Limbic System. AMERICAN SOCIETY OF NEURORADIOLOGY, 1986 ANNUAL MEETING, San Diego, CA, January 1986. (Atlas S, Zimmerman R, Bilaniuk L, Hackney D, Goldberg H, Grossman R).
8. High Field Surface Coil MR of Orbital Pseudotumor. AMERICAN SOCIETY OF NEURORADIOLOGY, 1986 ANNUAL MEETING, San Diego, CA, January 1986, (Atlas SW, Grossman RI, Savino PJ, Schatz NJ, Sergott RC, Bosley TM, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA).
9. Enhanced Magnetic Resonance Imaging in Multiple Sclerosis. AMERICAN ACADEMY OF NEUROLOGY, 1986 ANNUAL MEETING, New Orleans, LA, May 1986. (Gonzalez-Scarano F, Grossman R, Galetta S, Atlas S, Silberberg D).
10. MRI of Cerebral Aneurysms. XIII NEURORADIOLOGICUM SYMPOSIUM, Stockholm, Sweden, June 1986. (Zimmerman RA, Atlas S, Bilaniuk LT, Hackney D, Goldberg HI, Grossman RI).
11. Gadolinium Enhancement in Multiple Sclerosis. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE. 1986 ANNUAL MEETING, Montreal, Canada, August 1986. (Grossman RI, Gonzalez-Scarano F, Atlas SW, Galetta S, Silberberg D).

12. Internuclear Ophthalmoplegia: MR - Anatomic Correlation. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE, 1986 ANNUAL MEETING, Montreal, Canada, August 1986. (Atlas SW, Grossman RI, Savino PJ, Schatz NJ, Sergott RC, Bosley TM, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA).
13. High Field MR of Giant Intracranial Aneurysms: Radiologic - Pathologic Correlation. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE, 1986 ANNUAL MEETING, Montreal, Canada, August 1986. (Atlas SW, Grossman RI, Goldberg HI, Hackney DB, Bilaniuk LT, Zimmerman RA).
14. Internuclear Ophthalmoplegia: MR Anatomic Correlation. RADIOLOGICAL SOCIETY OF NORTH AMERICA, IL, November 1986, (Atlas SW, Grossman RI, Savino PJ, Schatz NJ, Bosley TM, Sergott RC, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA).
15. MR of Partially Thrombosed Giant Intracranial Aneurysms: Radiologic-Pathologic Correlation. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 72ND SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1986. (Atlas SW, Grossman RI, Goldberg HI, Hackney DB, Bilaniuk LT, Zimmerman RA).
16. MR Imaging of Intracranial Melanoma Metastases. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 72ND SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1986. (Atlas SW, Grossman RI, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA).
17. High Field MR Imaging of Hemorrhagic Tumors of the Central Nervous System. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 72ND SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1986, (Atlas SW, Grossman RI, Gomori JM, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA).
18. Surface Coil MR of the Orbit at 1.5T: Initial Experience. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 72ND SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1986. (Atlas SW, Bilaniuk LT, Zimmerman RA, Hackney DB, Goldberg HI, Grossman RI).
19. Proton Spectroscopic Phase Dependent Contrast Imaging of Orbital Lesions in Surface Coil MR. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 72ND SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1986. (Atlas SW, Grossman RI, Axel L, Hackney DB).
20. Spin Density Contribution to the High Signal Intensity of Methemoglobin in Intracranial Hemorrhage on Spin Echo MR, RADIOLOGICAL SOCIETY OF NORTH AMERICA, 72ND SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1986. (Atlas SW, Hackney DB, Grossman RI, Gomori JM, Goldberg HI, Zimmerman RA, Bilaniuk LT).
21. STIR MR Imaging of the Orbit. AMERICAN SOCIETY OF NEURORADIOLOGY, 1987 ANNUAL MEETING, New York, NY, May 1987. (Atlas SW, Grossman RI, Hackney DB, Bilaniuk LT, Zimmerman RA, Goldberg HI).
22. The Utility of Gradient Echo Acquisition in the Detection of Calcified Intracranial Lesions with MR Imaging. AMERICAN SOCIETY OF NEURORADIOLOGY, 1987 ANNUAL MEETING, New York, NY, May 1987, (Atlas SW, Grossman RI, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA).
23. MR Imaging of Hemorrhagic Conditions of the Head and Neck. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 72ND SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1986. AMERICAN SOCIETY OF



NEURORADIOLOGY, 1987 ANNUAL MEETING, New York, NY, May 1987. (Grossman RI, Gomori JM, Goldberg HI, Hackney DB, Kemp SS, Atlas SW, Zimmerman RA, Bilaniuk LT).

24. Clinical Utility of Fast Scanning Techniques in the Brain. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE, 1987 ANNUAL MEETING, New York, NY, August 1987. (Grossman RI, Atlas SW, Braffman B, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA).

25. Spin-Echo MR Imaging of Intracerebral Metastases. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE, 1987 ANNUAL MEETING, New York, NY, August 1987. (Atlas SW, Grossman RI, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA).

26. MR Imaging of Intracranial Vascular Lesions Using Fast Scanning. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE, 1987 ANNUAL MEETING, New York, NY, August 1987. (Atlas SW, Grossman RI, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA).

27. MR Imaging of Intracranial Melanoma Metastases: Improved Sensitivity with Gradient Refocused Echo Acquisition - Reduced Flip Angle MR. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE, 1987 ANNUAL MEETING, New York, NY, August 1987. (Atlas SW, Grossman RI, Guerry D, Hackney DB, Gomori JM, Goldberg HI, Campagna N, Bilaniuk LT, Zimmerman RA).

28. Spin Density Contribution to the Appearance of Subacute Intracranial Hemorrhage on Magnetic Resonance. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE, 1987 ANNUAL MEETING, New York, NY, August 1987. (Hackney DB, Atlas SW, Grossman RI, Gomori JM, Zimmerman RA, Goldberg HI, Bilaniuk LT).

29. The Results of Radiotherapy for Orbital Pseudotumor. AMERICAN SOCIETY FOR THERAPEUTIC RADIOLOGY AND ONCOLOGY, 29th ANNUAL MEETING, Boston, MA, October 1987 (Lanciano R, Atlas S, Rubenstein J, Sergott R, Fowble B).

30. MR Imaging Characteristics of Intracranial Hemorrhage Using Gradient-Echo Signal Acquisition at 1.5T: Comparison with Spin-Echo Imaging and Clinical Applications. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 73RD SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1987. (Atlas SW, Grossman RI, Gomori JM, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA).

31. MR Imaging of Intracranial Vascular Lesions Using Fast Imaging. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 73RD SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1987. (Atlas SW, Grossman RI, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA).

32. A Flexible Surface Coil for High-Resolution MR Imaging of the Orbits. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 73RD SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1987. (Lenkinski RE, Kressel HY, Atlas SW, Holland GA, Claiborne TC, Hirshman AD).

33. Gadolinium Enhancement in Multiple Sclerosis: Repeat Study of Patients with Definite Multiple Sclerosis. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 73RD SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1987. (Grossman RI, Braffman BH, Atlas SW, Goldberg HI, Hackney DB, Bilaniuk LT, Silberberg DH, Gonzalez-Scarano F).



34. Aqueductal Stenosis: Evaluation with Gradient Echo Acquisition MR Imaging. SOCIETY FOR MAGNETIC RESONANCE IMAGING, ANNUAL MEETING, Boston, February 1988. (Atlas SW, Mark AS, Fram EK).
35. Optic Chiasm Gliomas in Neurofibromatosis Patients: MR Characteristics. SOCIETY FOR MAGNETIC RESONANCE IMAGING, ANNUAL MEETING, Boston, February 1988. (Dowd CP, Atlas SW, Hoyt W, Newton D).
36. PML in AIDS: MR Imaging. SOCIETY FOR MAGNETIC RESONANCE IMAGING, ANNUAL MEETING, Boston, February 1988. (Mark AS, Atlas SW, Olsen WP).
37. Spinal Cord Transection in Children: Diagnosis by MRI. AMERICAN SOCIETY OF NEURORADIOLOGY 1988 ANNUAL MEETING, Chicago, May 1988. (Mark AS, Berry I, Atlas SW, Sanchez J, Lee SR, Manelfe C, Newton TH).
38. MR Imaging of Discogenic Disease in the Lumbar Spine: Comparison of Gradient Echo with Spin Echo Techniques. AMERICAN SOCIETY OF NEURORADIOLOGY 1988 ANNUAL MEETING, Chicago, May 1988. (Mark AS, Atlas SW, Fram EK).
39. MR Imaging of PML in AIDS Patients. AMERICAN SOCIETY OF NEURORADIOLOGY 1988 ANNUAL MEETING, Chicago, May 1988. (Mark AS, Atlas SW, Olsen WP).
40. The Differential Utility of Gradient Echo and Spin Echo Magnetic Resonance Imaging in Metastatic Disease to the Spine. AMERICAN SOCIETY OF NEURORADIOLOGY 1988 ANNUAL MEETING, Chicago, May 1988. (Gusnard DA, Grossman RI, Hackney DB, Atlas SW, Goldberg HI, Zimmerman RA, Bilaniuk LT).
41. Imaging of Posterior Fossa Cystic Malformations: Pre- and Post- Shunting. AMERICAN SOCIETY OF NEURORADIOLOGY 1988 ANNUAL MEETING, Chicago, May 1988. (Gusnard DA, Bilaniuk LT, Zimmerman RA, Sutton LN, Hackney DB, Goldberg HI, Grossman RI, Atlas SW, Schut L).
42. MR Imaging Prior to and Following Electroconvulsive Therapy in Patients with Major Affective Disorders. AMERICAN SOCIETY OF NEURORADIOLOGY 1988 ANNUAL MEETING, Chicago, May 1988. (Braffman BH, Grossman RI, Shah A, McCallister T, Price TPR, Gyulai L, Atlas SW, Hackney DB, Goldberg HI, Bilaniuk LT, Zimmerman RA).
43. Visual Pathway Gliomas in Neurofibromatosis Patients: MR Characteristics. AMERICAN SOCIETY OF NEURORADIOLOGY, 1988 ANNUAL MEETING, May 1988, Chicago, IL. (Dowd CF, Atlas SW, Hoyt WF).
44. The MR Characteristics of Low versus High Grade Gliomas. AMERICAN SOCIETY OF NEURORADIOLOGY 1988 ANNUAL MEETING, May 1988, Chicago, IL. (Fobben ES, Hackney DB, Zimmerman RA, Goldberg HI, Grossman RI, Atlas SW, Bilaniuk LT).
45. Human Malignant Melanomas in Nude Mice: MR Imaging Correlations with Histopathology and EPR. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE, 1988 ANNUAL MEETING, San Francisco, August 1988. (Atlas SW, Braffman B, LoBrutto R, Elder DE, Herlyn D).

46. Magnetic Resonance Imaging of Ruptured Intracranial Aneurysms. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE 1988 ANNUAL MEETING, August 1988, San Francisco, CA. (Hackney DB, Goldberg HI, Atlas SW, Zimmerman RA, Grossman RI, Bilaniuk LT).
47. Human Malignant Melanomas in Nude Mice: MR Imaging Correlations with Histopathology and Electron Paramagnetic Resonance. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 74TH SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1988. (Atlas SW, Braffman B, LoBrutto R, Elder DE, Herlyn D).
48. MR Imaging in Temporal Lobe Epilepsy. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 74TH SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1988. (Fobben ES, Zimmerman RA, Sperling MR, Atlas SW, Hackney DB, Goldberg HI, Bilaniuk LT, Grossman RI).
49. MR Imaging Observations in Head Injury and their Importance in Understanding the Pathophysiology of Head Trauma. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 74TH SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1988. (Grossman RI, Atlas SW, Hackney DB, Goldberg HI, Gomori JM, Zimmerman RA, Bilaniuk LT, Alves WM, Gennarelli TA).
50. Gradient-echo Versus Spin-echo Imaging of the Osteoporotic Spine. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 74TH SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1988. (Gusnard DA, Grossman RI, Hackney DB, Kaplan FS, Atlas SW, Zimmerman RA, Goldberg HI, Bilaniuk LT).
51. Pachygyria: CT and MR Imaging Analysis. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 74TH SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1988. (Titelbaum DS, Zimmerman RA, Hayward JC, Bilaniuk LT, Atlas SW, Goldberg HI, Grossman RI, Hackney DB).
52. Vertebral Basilar Artery Dissections. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 74TH SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1988. (Zimmerman RA, Bilaniuk LT, Hackney DB, Grossman RI, Goldberg HI, Atlas SW).
53. Bilateral Pial Siderosis and Hearing Loss: Syndrome with Negative CT and Positive High Field MR Imaging Findings. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 74TH SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 1988. (Zimmerman RA, Hesselink JR, Bilaniuk LT, Hackney DB, Davis M, Grossman RI, Goldberg HI, Atlas SW).
54. Pseudo-atrophy of the Cervical Spinal Cord: A Manifestation of Truncation Artifact. AMERICAN SOCIETY OF NEURORADIOLOGY 1989 ANNUAL MEETING, Orlando, March 1989. (Yousem DM, Janick PA, Atlas SW, Grossman RI).
55. Pediatric Cerebral Infarction and Brain Iron on MR Imaging: Clinical and Pathophysiologic Implications. AMERICAN SOCIETY OF NEURORADIOLOGY 1989 ANNUAL MEETING, Orlando, March 1989. (Cross PA, Atlas SW, Grossman RI).
56. Ultra-Small Field of View MR Imaging of the Iris and Ciliary Body *In Vivo*. AMERICAN SOCIETY OF NEURORADIOLOGY 1989 ANNUAL MEETING, Orlando, March 1989. (Yousem DM, Atlas SW, Listerud J, Dougherty L, Moderski J, Lenkinski RE, Grossman RI).

57. MR of Tolosa-Hunt Syndrome. AMERICAN SOCIETY OF NEURORADIOLOGY 1989 ANNUAL MEETING, Orlando, March 1989. (Yousem DM, Atlas SW, Grossman RI, Sergott RC, Savino PJ, Bosley TM).

58. T1 Images Derived from Rapidly Acquired Gradient Echo Data: Works-in-Progress. EASTERN NEURORADIOLOGICAL SOCIETY 1989 ANNUAL MEETING, New York, July 1989. (Bobman SA, Wehrli FW, Yousem DM, Atlas SW).

59. Intracranial Sarcoidosis: Evaluation with Gadolinium-enhanced MR Imaging. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 75TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. November 26 - December 1, 1989. (Seltzer S, Mark AS, Atlas SW).

60. MR imaging of visual pathway gliomas. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 75TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. November 26 - December 1, 1989. (Bilaniuk LR, Zimmerman RA, Gusnard DA, Packer RJ, Sutton LN, Atlas SW, Hackney DB, Goldberg HI, Grossman RI, Schut L, Rorke LB).

61. High-resolution three-dimensional fourier transform SSFP MR imaging of the brain. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 75TH ANNIVERSARY SCIENTIFIC ASSEMBLY ANNUAL MEETING, Chicago, IL. November 26 - December 1, 1989. (Menick B, Bobman S, Atlas SW).

62. Contrast-enhanced, chemical shift MR imaging of the postoperative lumbar spine. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 75TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. November 26 - December 1, 1989. (Bobman S, Atlas SW, Listerud J, Grossman RI).

63. MR imaging of the brain in children with neurofibromatosis types I and II: Focal areas of abnormal signal intensity. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 75TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. November 26 - December 1, 1989. (Gusnard DA, Cohen BH, Zimmerman RA, Bilaniuk LT, Zackai EH, Packer PJ, Branton R, Rorke LB, Grossman RI, Atlas SW, Goldberg HI, Hackney DB).

64. Acute traumatic cataracts: CT evaluation. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 75TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. November 26 - December 1, 1989. (Titelbaum DS, Grossman RI, Lloyd WC III, Cohen EJ, Atlas SW).

65. Intracerebral gliomas: quantitative imaging with integrated MR imaging, MR spectroscopy, and PET. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 75TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. November 26 - December 1, 1989. (Atlas SW, Tanna NK, Lenkinski RE, Kohn MI, Alavi J, Alavi A, Reivich M, Mollman J, Flamm E, Powlis W, Raya SP, Gonatas N, Herman G).

66. Ultrathin, high-resolution, three-dimensional fourier transform gradient-echo MR imaging of cervical spine for animal disease. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 75TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. November 26 - December 1, 1989. (Yousem DM, Atlas SW, Goldberg HI, Grossman RI).

67. Gadolinium-enhanced MR evaluation of pediatric brain tumors. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 75TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. November 26 -

December 1, 1989. (Zimmerman RA, Bilaniuk LT, Gusnard GA, Hackney DB, Atlas SW, Grossman RI, Goldberg HI).

68. Integrated imaging and solvent-suppressed proton spectroscopy of brain tumors. AMERICAN SOCIETY OF NEURORADIOLOGY 1990 ANNUAL MEETING, Los Angeles, March 1990. (Lenkinski, RE, Milestone BN, Yousem DM, Sutton L, Atlas SW).

69. Intracranial and Spinal Sarcoidosis: Evaluation with Gadolinium Enhanced MRI. AMERICAN SOCIETY OF NEURORADIOLOGY 1990 ANNUAL MEETING, Los Angeles, March 1990. (Mark AS, Seltzer S, Atlas SW).

70. A Method for Fat Suppression in MR Angiography. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE 1990 ANNUAL MEETING, New York, August 1990. (Listerud J, Hatabu H, Atlas S).

71. Signal Loss in the Normal Proximal Internal Carotid Artery in 3DFT MR Angiography: Correlation with Color Doppler Flow Imaging. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE 1990 ANNUAL MEETING, New York, August 1990. (Hatabu H, Listerud J, McGowan JC, Arger P, Atlas S)

72. Volume quantification of gray matter nuclei iron in healthy subjects based on long TR/long TE MR imaging at 1.5T: Stratification with normal aging. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 76TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. November 25 - November 30, 1990. (Milton W, Atlas SW, Lexa F, Gur R, Mozley PD).

73. Volume quantification of gray matter nuclei iron in closed head trauma patients based on follow-up with long TR/long TE MR imaging at 1.5T: Correlation with clinical status. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 76TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. November 25 - November 30, 1990. (Lexa F, Atlas SW, Milton W, Gur R, Alves W, Genarelli T).

74. High resolution three-dimensional Fourier transform gradient echo MR imaging of cervical spine discogenic disease: comparison of interpretations with axial acquisition alone versus reformatting in combination with axial images. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 76TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. November 25 - November 30, 1990. (Atlas SW, Yousem D).

75. Improved post-processing method for MR angiography. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 76TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. November 25 - November 30, 1990. (McGowan JC, Listerud J, Hatabu H, Atlas SW, Kressel HY).

76. Intravenous contrast enhanced orbital MR imaging of retrobulbar masses by means of radiofrequency-spoiled three-dimensional Fourier transform gradient echo chemical shift imaging. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 76TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. November 25 - November 30, 1990. (Bobman S, Atlas SW, Grossman RI).

77. Preliminary experience with a new nonionic (zero net charge) gadolinium preparation in patients with intracranial tumors. SOCIETY FOR MAGNETIC RESONANCE IMAGING, 1991 ANNUAL MEETING, Chicago, IL. April 13-17, 1991. (Pollei SR, Atlas S, Drayer B, Rosa L, Runge V, Sze G, Yuh WTC).

78. Preliminary experience with a new nonionic (zero net charge) gadolinium preparation in patients with intracranial tumors. AMERICAN ROENTGEN RAY SOCIETY, 1991 ANNUAL MEETING, Boston, MA. May 5-10, 1991. (Pollei SR, Atlas S, Drayer B, Rosa L, Runge V, Sze G, Yuh WTC).
79. Optimization of parameters for fast spin echo (FSE) imaging of the brain. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE 1991 ANNUAL MEETING, San Francisco, August 1991. (Hackney DB, Listerud J, Yousem DM, Atlas SW).
80. Fast spin echo (FSE) MR imaging: blinded comparison with conventional spin echo imaging for the detection of focal brain lesions. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE 1991 ANNUAL MEETING, San Francisco, August 1991. (Atlas SW, Hackney DB, Yousem DM, Listerud J).
81. Magnetic resonance angiography of the Circle of Willis: 3D time-of-flight versus 3D phase contrast. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE 1991 ANNUAL MEETING, San Francisco, August 1991. (Atlas SW, Listerud J, Goldberg HI).
82. TRAP: Traced Ray by Array Processor. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE 1991 ANNUAL MEETING, San Francisco, August 1991. (Listerud J, Atlas SW, McGowan JC, Butler N)
83. "Multiecho" Imaging with Fast Spin Echo Using an Alternating Echo Assignment. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE 1991 ANNUAL MEETING, San Francisco, August 1991. (Listerud J, Hackney DB, Yousem D, Atlas SW)
84. Fast spin echo (FSE) MR imaging: blinded comparison with conventional spin echo imaging for the detection of focal brain lesions. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 77TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. December 2-7, 1991. (Atlas SW, Hackney DB, Yousem DM, Listerud J).
85. MR angiography of the Circle of Willis: 3D time-of-flight versus 3D phase contrast. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 77TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. December 2-7, 1991. (Atlas SW, Listerud J, Chung W, Goldberg HI)
86. MR angiography of the Circle of Willis and Middle Cerebral Bifurcation: Traced Ray with Array Processor versus Maximum Intensity Projection Reconstruction. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 77TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. December 2-7, 1991. (Atlas SW, Listerud J).
87. Gadolinium-DTPA Enhancement of the Cisternal Portion of the Third Cranial Nerve on MRI: Clinical and Pathologic Correlation. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 77TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. December 2-7, 1991. (Mark AS, Blake P, Atlas SW, Ross M)
88. Cervical Spine Disk Disease: Blinded Comparison of Thin Section 3DFT MRI with Intrathecal Contrast-Enhanced CT. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 77TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. December 2-7, 1991. (Yousem DM, Atlas SW, Hackney DB).

89. Suitability of Three-Dimensional Fast Spin Echo Pulse Sequence as a Black Blood Angiographic Technique. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 77TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. December 2-7, 1991. (Listerud J, Atlas SW).
90. TRAP: Traced Ray by Array Processor. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 77TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. December 2-7, 1991. (Listerud J, McGowan JC, Atlas SW).
91. Phase III Multicenter Trial of High-Dose Gadolinium MR Imaging in the Evaluation of Brain Metastases. AMERICAN SOCIETY OF NEURORADIOLOGY 1992 ANNUAL MEETING, St. Louis, June 1992. (Yuh WTC, Fisher DJ, Harms SE, Maravilla KR, Price AC, Runge VM, Mollman J, Atlas SW)
92. Delineation of Gliomas with Various Doses of MR Contrast Agents. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE 1992 ANNUAL MEETING, Berlin, August 1992. (Yuh WTC, Tali ET, Nguyen H, Mayr-Yuh NA, Gao F, Atlas SW, Carvlin MC, Drayer BP, Pollei SR, Runge V, Sze GK)
93. Contrast Enhanced MR Angiography for Intracranial Aneurysms with 3D Time-of-Flight and 3D Phase-Contrast Techniques. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 78TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. December 1-5, 1992. (Chung W, Listerud J, Atlas SW)
94. In Vitro Study of Magnetization Transfer and Relaxation Rates of Hematoma. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 78TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. December 1-5, 1992. (Gomori JM, Grossman RI, Asakura T, Schnall M, Atlas SW, Holland G, et al)
95. Magnetization Transfer Contributions to the Appearance of in In Vivo Acute Intracranial Hemorrhage on MR Images Obtained at 1.5T. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 78TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. December 1-5, 1992. (Mittl R, Gomori JM, Schnall M, Holland G, Grossman RI, Atlas SW)
96. Carotid Bifurcation Stenosis: Blinded Reader Comparison of 2D Time-of-Flight MR Angiography with Ultrasound in Cases Proved with Angiography. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 78TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. December 1-5, 1992. (Mittl, Broderick M, Listerud J, Goldberg HI, Atlas SW)
97. Improved Black Blood 3D Fast SE MR Angiography. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 78TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. December 1-5, 1992. (Listerud J, Atlas SW, Hinks RS)
98. Glioma Delineation with Contrast-Enhanced MR: Effect of Gadolinium Dose. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 78TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL. December 1-5, 1992. (Yuh WTC, Mayr-Yuh NA, Atlas SW, Carvlin MC, Drayer BP, Runge V, et al)
99. Magnetization Transfer: Theory and Clinical Applications in Neuroradiology. RADIOLOGICAL SOCIETY OF NORTH AMERICA 1992 ANNUAL MEETING, Chicago, December 1992. (Grossman RI, Gomori JM, Lexa FJ, Jarvik J, Boorstein J, Hiehle J, Atlas SW, Schnall M).



100. A Simple Objective Method for Automated Derivation of Thresholds for MR Angiographic Postprocessing based on Histogram Analysis. SOCIETY OF MAGNETIC RESONANCE IN MEDICINE 1993 ANNUAL MEETING, New York, August 1993. (Listerud J, Isaac G, Atlas SW).
101. Objective Criterion for Setting Thresholds in MR Angiography. RADIOLOGICAL SOCIETY OF NORTH AMERICA, 79TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 29-Dec 3, 1993. (Listerud J, Isaac G, Atlas SW)
102. Dynamic Echoplanar MR Imaging of Activated Human Visual Cortex with a Conventional 1.5T System, RADIOLOGICAL SOCIETY OF NORTH AMERICA, 79TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 29-Dec 3, 1993. (Atlas SW, Listerud J, Stacker M, Noone R.)
103. Ramped Excitation 3DFT Time of Flight MR Angiography of the Extracranial Carotid Artery, RADIOLOGICAL SOCIETY OF NORTH AMERICA, 79TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 29-Dec 3, 1993. (Hiehle J, Atlas SW, Listerud J, Goldberg HI, Schneider E.)
104. Ramped Excitation Magnetization Transfer 3DFT Time of Flight MR Angiography in the Intracranial Circulation: Comparison with 3DFT Phase Contrast Imaging, RADIOLOGICAL SOCIETY OF NORTH AMERICA, 79TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 29-Dec 3, 1993. (Hiehle J, Chung W, Atlas SW, Listerud J, Goldberg HI, Schneider E.)
105. Comparison of High Resolution 3DFT and 2DFT Time of Flight MR Angiography with Catheter Angiography for Evaluation of Carotid Artery Bifurcation Stenosis, RADIOLOGICAL SOCIETY OF NORTH AMERICA, 79TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 29-Dec 3, 1993. (Goldberg HI, Atlas SW, Mishkin MM, Broderick M, Listerud J.)
106. Signal Loss in the Normal Proximal Internal Carotid Artery with 3D MR Angiography, RADIOLOGICAL SOCIETY OF NORTH AMERICA, 79TH ANNIVERSARY SCIENTIFIC ASSEMBLY AND ANNUAL MEETING, Chicago, IL, November 29-Dec 3, 1993. (Listerud J, Hatabu H, McGowan J, Atlas SW, Arger P)
107. Subcortical Hemorrhage: Marker for the Presence of Radiographically Occult Cerebral Venous Thrombosis on CT of the Brain. AMERICAN SOCIETY OF NEURORADIOLOGY 1994 ANNUAL MEETING, Nashville, May 1994. (Keiper M, Ng S, Atlas SW, Grossman RI)
108. Functional MRI of Regional Brain Activity in Patients with Intracerebral Gliomas and AVMs prior to Surgical or Endovascular Therapy. SOCIETY OF MAGNETIC RESONANCE 1994 ANNUAL MEETING, San Francisco, August 1994. (Howard R, Maldjian J, Alsop D, Detre J, Listerud J, D'Esposito M, Zager E, Judy K, Atlas SW)
109. Validation of Regions of Positive and Negative Correlation to Stimulus Observed on Student's t Maps Calculated from Functional MRI Studies in Normal Volunteers. SOCIETY OF MAGNETIC RESONANCE 1994 ANNUAL MEETING, San Francisco, August 1994. (Listerud J, Lopez-Villegas L, Isaac G, Atlas SW, Detre J, Alsop D)
110. 3D Fast Spin Echo MRI of the Cervical Spine. SOCIETY OF MAGNETIC RESONANCE 1994 ANNUAL MEETING, San Francisco, August 1994. (Holland G, Listerud J, Atlas SW, Schnall M).

111. Functional MRI (fMRI) of Regional Brain Activity in Patients with Intracerebral Gliomas and AVMs prior to Surgical or Endovascular Therapy. SOCIETY OF MAGNETIC RESONANCE 1994 ANNUAL MEETING, San Francisco, August 1994. (Howard R, Maldjian J, Alsop D, Detre J, Listerud J, D'Esposito M, Zager E, Judy K, Flamm E, Hurst R, Atlas SW)
112. Activation of Dorsolateral Prefrontal Cortex during a Dual Task Working Memory Paradigm using Functional MRI. SOCIETY FOR NEUROSCIENCE 1994 ANNUAL MEETING (D'Esposito M, Detre JA, Alsop DC, Listerud J, Atlas SW, Grossman M)
113. Functional MRI (fMRI) of Regional Brain Activity in Patients with Intracerebral AVMs Prior to Surgical or Endovascular Therapy. RADIOLOGICAL SOCIETY OF NORTH AMERICA 1994 ANNUAL MEETING, Chicago, November 1994 (Maldjian J, Howard R, Alsop D, Detre J, Listerud J, Atlas SW)
114. Blinded reader study of MRA in patients with arteriographically proven intracranial aneurysms using *STANDOUT*, a sophisticated image post-processing technique. RADIOLOGICAL SOCIETY OF NORTH AMERICA 1994 ANNUAL MEETING, Chicago, November 1994 (Sheppard L, Listerud J, Hurst R, Goldberg H, Atlas SW)
115. 3DFT Multislab Fast Spin Echo High Resolution MR Imaging of Cervical Spine Degenerative Disc Disease. RADIOLOGICAL SOCIETY OF NORTH AMERICA 1994 ANNUAL MEETING, Chicago, November 1994 (Howard R, Chung W, Holland G, Listerud J, Atlas SW)
116. Time Domain Cross Correlation Analysis of Functional MRI Data Sets. AMERICAN SOCIETY OF NEURORADIOLOGY 1995 ANNUAL MEETING, Chicago, April 1995. (Maldjian J, Howard R, van Buchem MA, Alsop D, Atlas SW)
117. Anatomical and Semiquantitative Analysis of Speech and Motor Cortex Activity using BOLD Functional MRI (fMRI) in Patients with Infiltrative Gliomas. AMERICAN SOCIETY OF NEURORADIOLOGY 1995 ANNUAL MEETING, Chicago, April 1995. (Howard R, Maldjian J, van Buchem MA, Alsop D, Detre J, D'Esposito M, Listerud J, Judy K, Atlas SW)
118. Time Domain Cross Correlation Analysis of Functional MRI during Complex Tasks. . SOCIETY OF MAGNETIC RESONANCE 1995 ANNUAL MEETING, Nice, France, August 1995. (Atlas SW, Maldjian J, Listerud J)
119. Timeshift Correlation Analysis of Functional MRI during Complex Motor Tasks. RADIOLOGICAL SOCIETY OF NORTH AMERICA 1995 ANNUAL MEETING, Chicago, November 1995. (Atlas SW, Maldjian J, Coshow W, Listerud J, Gong Z)
120. Fast FLAIR MRI in Ischemic White Matter Lesions: Quantitative Comparison with Fast Spin Echo Imaging. RADIOLOGICAL SOCIETY OF NORTH AMERICA 1996 ANNUAL MEETING, Chicago, November 1996. (Amaral L, Fredriksson L, Atlas SW)
121. Correlates between Glucose Metabolic Rate and Diffusion Anisotropy in Normals and Schizophrenics. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 1997 ANNUAL MEETING, Vancouver, Canada, March 1997. (Tang CY, Peled S, Buchsbaum MS, Gudbjartsson H, Lu D, Downhill J, Haznedar M, Hazlett EA, Atlas SW).



122. Image Processing Techniques for the Eigenvectors of the Diffusion Tensor. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 1997 ANNUAL MEETING, Vancouver, Canada, March 1997. (Tang CY, Lu D, Wei TC, Speigel J, Atlas SW, Buchsbaum MS).
123. SNR and Resolution Improvement in Clinical Diffusion Imaging. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 1997 ANNUAL MEETING, Vancouver, Canada, March 1997. (Keller PJ, Heiserman JE, Karis JP, Atlas SW).
124. MRI Findings in AIDS Myelopathy. AMERICAN SOCIETY OF NEURORADIOLOGY 1997 ANNUAL MEETING, Toronto, Canada. (Chong J, DiRocco A, Danisi F, Simpson D, Tagliati M., Atlas SW).
125. Diffusion Weighted MRI of Acute Infarction: Comparison of Blinded Readings using Three Orthogonal Axis Diffusion Images, Isotropic Diffusion Images, Trace-Weighted Images, and Trace Images. AMERICAN SOCIETY OF NEURORADIOLOGY 1997 ANNUAL MEETING, Toronto, Canada. (Chong J, Singer M, Lu D, Aragao F, Keller P, Silvers A, Tuhrim S, Schonewille WJ, Atlas SW).
126. Diffusion-Weighted MRI of Acute Isolated Subcortical Infarction. AMERICAN SOCIETY OF NEURORADIOLOGY 1997 ANNUAL MEETING, Toronto, Canada. (Singer M, Chong J, Lu D, Tuhrim S, Schonewille WJ, Atlas SW).
127. Diagnosis of Subarachnoid Space Disease with FLAIR. RADIOLOGICAL SOCIETY OF NORTH AMERICA 1997 ANNUAL MEETING, Chicago, December 1997. (Singer M, Drayer BP, Atlas SW).
128. Gradient Echo MRI Demonstrates Hemorrhage in Acute Lacunar Infarction. 23RD INTERNATIONAL JOINT CONFERENCE ON STROKE AND CEREBRAL CIRCULATION, ORLANDO, February 1998. (Schonewille W, Tuhrim S, Singer MB, Atlas SW).
129. Radiological Localization of Acute Lacunar Syndromes on Diffusion Weighted MRI. 23RD INTERNATIONAL JOINT CONFERENCE ON STROKE AND CEREBRAL CIRCULATION, Orlando, February 1998. (Schonewille W, Tuhrim S, Singer MB, Atlas SW).
130. Diffusion Anisotropy and Pixel Dimensions. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 1998 ANNUAL MEETING, Sydney, April 1998 (Lu D, Tang C, Zhou X, Buchsbaum B, Buchsbaum M, Atlas SW)
131. Functional MRI of Sex Differences in Pain Response. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 1998 ANNUAL MEETING, Sydney, April 1998 (Tang C, Buchsbaum B, Buchsbaum M, Lu D, Wei TC, Spiegel-Cohen JL, Atlas SW)
132. Diffusion Measurements in MS Lesions and Normal Appearing White Matter. AMERICAN SOCIETY OF NEURORADIOLOGY 1998 ANNUAL MEETING, Philadelphia, May 1998 (Nusbaum A, Lu D, Atlas SW).
133. Diffusion Trace for the Diagnosis of Tumor Necrosis in Intracerebral Neoplasms. AMERICAN SOCIETY OF NEURORADIOLOGY 1998 ANNUAL MEETING, Philadelphia, May 1998 (Chong J, Lu D, Eisenkraft B, Singer MB, Hague K, Germano I, Atlas SW)
134. Calculated Diffusion in Evolving Intracerebral Hematomas. AMERICAN SOCIETY OF NEURORADIOLOGY 1998 ANNUAL MEETING, Philadelphia, May 1998 (Singer MB, DuBois P, Lu D, Atlas SW)

135. White Matter Bundle Abnormalities in Alzheimer's Disease, AMERICAN COLLEGE OF NEUROPSYCHOPHARMACOLOGY 1998 ANNUAL MEETING, December 1998 (Shihabuddin L, Nusbaum A, Atlas S, White S, Brickman A, Hazlett EA, Marin D, Tang C, Wei T-C, Buchsbaum MS)
136. Functional MRI during Rapid Auditory Processing in Normal Adults: Correlation to Task Performance and Implications for the Study of Dyslexia, RADIOLOGICAL SOCIETY OF NORTH AMERICA 1998 ANNUAL MEETING, Chicago, December 1998 (Nusbaum A, Tang CY, Bedi G, Dorsett ES, Buchsbaum MS, Atlas SW).
137. Normal Age-Related Changes in Cerebral White Matter Diffusion Anisotropy, RADIOLOGICAL SOCIETY OF NORTH AMERICA 1998 ANNUAL MEETING, Chicago, December 1998 (Nusbaum A, Tang CY, Buchsbaum MS, Lu D, Atlas SW).
138. Rapid 3D Contrast Enhanced MRA of the Carotid Arteries: Comparison with Conventional Angiography, RADIOLOGICAL SOCIETY OF NORTH AMERICA 1998 ANNUAL MEETING, Chicago, December 1998 (Kaplan R, Berez A, Atlas SW, Lane B, Marks MP).
139. Global Changes in Cerebral White Matter Diffusion with Normal Aging. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 1999 ANNUAL MEETING, Philadelphia, May 1999 (Nusbaum AO, Tang C, Buchsbaum MS, Wei TC, Atlas SW)
140. Whole Brain Diffusion Trace Histograms in Multiple Sclerosis. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 1999 ANNUAL MEETING, Philadelphia, May 1999 (Nusbaum AO, Tang C, Buchsbaum MS, Wei TC, Atlas SW)
141. Regional and Global Differences in Cerebral White Matter Diffusion with Alzheimer's Disease. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 1999 ANNUAL MEETING, Philadelphia, May 1999 (Nusbaum AO, Tang C, Buchsbaum MS, Shihabuddin L, Wei TC, Atlas SW)
142. Diffusion Tensor brain MRI in Very Low Birth Weight Preterm Infants. SOCIETY FOR PEDIATRIC RESEARCH, Boston, May 2000. (Mirmiran M, Wooley K, Hedehus M, Baldwin R, de Crispigny A, D'Arceuil H, Constantinou J, Fleisher B, Hahn J, Atlas S, Ariagno R)
143. Histogram Analysis of ADC and Fractional Anisotropy, Measured at Term, in Preterm Infants: Correlations to Birth Weight. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2000 ANNUAL MEETING, Denver, April 2000 (Woolley K, Hedehus M, Mirmiran M, Fleisher B, Betts B, Ariagno R, Atlas SW)
144. Regional Cerebral White Matter Diffusion Tensor Measurements Measured at Term in Preterm Infants: Correlations to Birth Weight. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2000 ANNUAL MEETING, Denver, April 2000 (Woolley K, Hedehus M, Mirmiran M, Fleisher B, deCrespigny A, D'Arceuil H, Betts B, Ariagno R, Atlas SW)
145. Histogram Analysis of ADC, Fractional Anisotropy, and Magnetization Transfer within Normal Appearing White Matter in Multiple Sclerosis Patients: Comparison to Normal Controls and Correlations to Clinical Disability. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2000 ANNUAL MEETING, Denver, April 2000 (Hedehus M, Tsukada G, Betts B, Langer-Gould A, Atlas SW)

146. Regional Diffusion Tensor and Magnetization Transfer Measurements within Normal Appearing White Matter in Multiple Sclerosis Patients: Comparison to Normal Controls and Correlations to Clinical Disability. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2000 ANNUAL MEETING, Denver, April 2000 (Tsukada G, Hedehus M, Betts B, Langer-Gould A, Atlas SW)

147. Reproducibility of Diffusion Anisotropy Measurements in Human Neonates. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2000 ANNUAL MEETING, Denver, April 2000 (D'Arceuil, Mirmiran M, Betts B, deCrespigny A, Hedehus M, Constantineau J, Blankenberg F, Fleisher B, Atlas SW, Moseley M, Ariagno R)

148. Emergency CT for Cervical Spine Trauma: Comparison of Interpretations by Radiology Residents to Neuroradiology Attendings; RADIOLOGICAL SOCIETY OF NORTH AMERICA 2000 ANNUAL MEETING, Chicago, December 2000 (Pandit R, Wolanske K, Atlas SW)

149. fMRI of Sensorimotor Cortex and SMA with Passive Movement in Patients with Intracerebral Lesions; RADIOLOGICAL SOCIETY OF NORTH AMERICA 2000 ANNUAL MEETING, Chicago, December 2000 (Tsukada G, Sanchez E, Illes J, Sawyer-Glover A, Atlas SW, Glover G)

150. Occult Disease in Gray and White Matter Differ between Subtypes of MS by Diffusion MR Histograms. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2001 ANNUAL MEETING, Glasgow, April 2001 (Rao A, Hedehus M, Betts B, Langer-Gould A, Atlas SW)

151. Brain Activation During Sexual Arousal in Healthy Heterosexual Males. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2001 ANNUAL MEETING, Glasgow, April 2001 (Aarnow B, Desmond J, Banner L, Glover GH, Abbehussen C, Lue T, Atlas SW)

152. Diffusion tensor MRI and volumetric analysis of the brain in VLBW preterm infants. PEDIATRIC ACADEMIC SOCIETIES, 2001 Annual Meeting; April 28-May1, Baltimore (Mirmiran, M, K. Woolley, K., Baldwin, R.B., Hedehus, M., Atlas, S.W., Ariagno, R.L.).

153. Sylvian fissure size in preterm infants. PEDIATRIC ACADEMIC SOCIETIES, 2001 Annual Meeting; April 28-May1, Baltimore (Hahn, J.S., Mirmiran, M., Saporito, AG, Woolley, K., Constantinou, J.C., Fleisher, B.E., Atlas, S.W., Ariagno, R.L.).

154. Image guided proteomics in human glioblastoma multiforme: new clinical technique for molecular target discovery; RADIOLOGICAL SOCIETY OF NORTH AMERICA 2000 ANNUAL MEETING, Chicago, December 2001 (Hobbs SK, Homer RJ, Harsch GW, Atlas SW, Li KCP, Bednarski MD)

155. Whole brain diffusion tensor imaging of preterm infants with no parenchymal lesion on conventional MRI: histogram analysis to predict clinical outcome. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2002 ANNUAL MEETING, Hawaii, May 2002 (Arzoumanian Y, Mirmiran, M., Woolley, K., Ariagno, R.L, Atlas SW)

156. Diffusion tensor imaging at term-equivalent age may predict functional neurological outcome in preterm infants with normal conventional MRI. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2002 ANNUAL MEETING, Hawaii, May 2002 (Arzoumanian Y, Mirmiran, M., Woolley, K., Ariagno, R.L, Atlas SW)

157. Neurologic findings in healthy children on pediatric fMRI: incidence and significance. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2002 ANNUAL MEETING, Hawaii, May 2002 (Kim B, Illes J, Reiss A, Atlas SW)

158. Image guided proteomics in human glioblastoma multiforme. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2002 ANNUAL MEETING, Hawaii, May 2002 (Hobbs SK, Homer RJ, Harsch GW, Atlas SW, Li KCP, Bednarski MD)

159. Perturbations in Diffusion Anisotropy and Magnetization Transfer Ratio Histograms due to Normal Spatial White Matter Variability. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2002 ANNUAL MEETING, Hawaii, May 2002 (R. Bammer, A. Rao, R.W. Prokesch, M.E. Moseley, S.W. Atlas, F. Fazekas)

160. Quantitative Brain Magnetic Resonance Imaging In Preterm Infants May Predict Later Cerebral Palsy. ANNUAL MEETING OF SOCIETY FOR PEDIATRIC RESEARCH 2002. (M. Mirmiran, Y Arzoumanian, P. Barnes, SW Atlas, M. Moseley, R Ariagno)

161. Use of Clinical Contrast-enhanced MRI to Demarcate Functional Genomic Sample Acquisition in Human Glioblastoma Multiforme (paper 756). RADIOLOGICAL SOCIETY OF NORTH AMERICA Annual Meeting 2002, December 2002. (Guccione S, Yang Y-S, Homer R, Harsh G, Atlas S, Bednarski M.)

162. Gadolinium-enhanced MRI Pattern Differences in Human Glioblastoma Multiforme Analyzed with Protein Microarray Profiles (paper 752). RADIOLOGICAL SOCIETY OF NORTH AMERICA Annual Meeting 2002, December 2002. (Hobbs S, Shi G, Homer R, Harsh G, Atlas S, Bednarski M)

163. Managed Care and The Diffusion of MRI in the US. International Society of Technology Assessment in Health Care (ISTAHC) 2003 International Scientific Assembly, June 2003. (Baker L, Atlas SW).

164. Gray matter NAA deficits in secondary progressive but not relapsing remitting multiple sclerosis: quantification with volumetric MR spectroscopic imaging. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2003 ANNUAL MEETING, Toronto, July 2003 (E. Adelsteinsson, A. Pfefferbaum, E. Sullivan, A. Rao, S.W. Atlas)

165. Magnetic Resonance Image guided proteomics of human glioblastoma multiforme. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2003 ANNUAL MEETING, Toronto, July 2003 (SK Hobbs, G Shi, R Homer, G Harsh, SW Atlas, M. D. Bednarski)

165. Participant Expectations of Incidental Findings in Neuroimaging Research. SOCIETY FOR COGNITIVE NEUROSCIENCE. San Francisco, CA, April 2004 (Kirschen, M., Drazin, D., Jaworska, Atlas, S.W., Raffin, T.A., Illes, J.).

166. Application of Novel Directionally Encoded Colormaps for Isolating Linear Anisotropic Structures in Human Brain Diffusion Tensor Magnetic Resonance Imaging, April 2006 INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2006 ANNUAL MEETING (DB Ennis, G Kindlmann, M Mogensen, T Vertinsky, SW Atlas, R Bammer).

167. Arterial Spin Label CBF Maps Can Show Abnormalities in Clinical Patients with Normal Bolus Perfusion-weighted Imaging: Identification of the "Watershed Sign. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2009 ANNUAL MEETING, Honolulu, HI, May 2009. (G. Zaharchuk, A. Shankaranarayan, R. Bammer, M. Straka, D. C. Alsop, N. J. Fischbein, SW Atlas, M. E. Moseley).

168. Ultra-High Resolution 7.0T MRI of Medial Temporal Lobe Epilepsy. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2009 ANNUAL MEETING, Honolulu, HI, May 2009. (M Zeineh, J Parvizi, P Balchandani, C Liu, G Glover, A Sawyer, R Fisher, SW Atlas).

169. Neural Correlates of "Focusing Qi" in a Tai Chi Master, June 2009, 15TH ANNUAL MEETING OF THE ORGANIZATION FOR HUMAN BRAIN MAPPING, San Francisco, California. (C Chang, J Rose, G Glover, SW Atlas).

170. Effect of MRI on Low Back Pain Diagnosis in the Medicare Population. June 14–17, 2009, BOSTON INTERNATIONAL FORUM X - PRIMARY CARE RESEARCH ON LOW BACK PAIN, Harvard School of Public Health, Boston, Massachusetts (Boras J, Baker L, Atlas SW).

171. Increased Detectability of Alzheimer Plaques at 7T vs. 3T using High Resolution bSSFP. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2010 ANNUAL MEETING, Stockholm, May 2010. (M Zeineh, B Rutt, SW Atlas).

172. Effect of Field Strength and Susceptibility-Weighted Imaging Processing on Alzheimer Plaque Detection in Human Brain Specimens; AMERICAN SOCIETY OF NEURORADIOLOGY 2010 ANNUAL MEETING, Boston, May 2010 (Zeineh MM, Kitzler H, Atlas SW, Rutt BK)

173. Effect of MR Imaging on Low Back Pain Diagnosis in the Medicare Population; AMERICAN SOCIETY OF NEURORADIOLOGY 2010 ANNUAL MEETING, Boston, May 2010 (Baras J, Baker LC, Atlas SW)

174. The Human 'Hyperdirect' Pathway: Diffusion Tensor Imaging Tractography with Physiological Confirmation in Parkinson's Disease. SOCIETY FOR NEUROSCIENCE 40<sup>TH</sup> ANNUAL MEETING, November 2010 (Henderson J, Bronte-Stewart H, Camille de Solages C, Atlas SW, Hill B)

175. Exposure to Ionizing Radiation and Estimate of Secondary Cancers in the Era of High Speed CT Scanning, RADIOLOGICAL SOCIETY OF NORTH AMERICA Annual Meeting 2010, December 2010. (Meer A, Basu P, Baker L, Atlas S)

176. High-Resolution Diffusion Imaging of the In Vivo Human Hippocampus, INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2011 ANNUAL MEETING, Montreal, May 2011. (M Zeineh, S. Holdsworth, S. Skare, B Rutt, SW Atlas, R. Bammer).

177. Susceptibility Mapping of Alzheimer Plaques at 7T, INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2011 ANNUAL MEETING, Montreal, May 2011. (M Zeineh, B Rutt, SW Atlas).

178. Initial Experience With Vessel Size Imaging in Recurrent Glioblastoma Multiforme using a Multiple Spin and Gradient Echo (SAGE) Perfusion Bolus Contrast Sequence. INTERNATIONAL SOCIETY OF MAGNETIC RESONANCE 2011 ANNUAL MEETING, Montreal, May 2011 (J. B. Andre, H. Schmiedeskamp, G. Zaharchuk, M. Straka, T. Christen, L. Recht, S.W. Atlas, and R. Bammer)

179. Zeineh MM, Holdsworth S, Skare S, Atlas S, Bammer R. Optimization of High Resolution Diffusion Imaging of the Human Medial Temporal Lobe. Oral Presentation to the AMERICAN SOCIETY OF NEURORADIOLOGY, Seattle, Washington, June 2011.

180. Zeineh MM, Holdsworth S, Skare S, Atlas S, Bammer R. Ultra-High Resolution Diffusion Tensor Imaging of the Microscopic Pathways of the Medial Temporal Lobe. Poster presentation at the INTERNATIONAL SOCIETY FOR MAGNETIC RESONANCE IN MEDICINE, Melbourne, Australia, May 2012

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF DR. JAMES**  
 21 **LYONS-WEILER IN SUPPORT OF**  
 22 **MOTION FOR PRELIMINARY**  
 23 **INJUNCTION**

Judge: Hon. Dean D. Pregerson

24 James Lyons-Weiler declares, pursuant to 28 U.S.C. § 1746:

25 1. My name is James Lyons-Weiler. I am a resident of Allison Park,  
 26 Pennsylvania; I am over 18 years-old; and I am otherwise competent to make this  
 27 declaration.

28 2. I am currently CEO and Director of The Institute for Pure and Applied  
 Knowledge in Pittsburgh, PA, a registered not-for-profit organization that conducts  
 biomedical research in the public interest. I was formerly Senior Research Scientist at  
 the University of Pittsburgh, where I served as the Scientific Director of the University





1 of Pittsburgh's Bioinformatics Analysis Core. Prior to that, I had been faculty in the  
2 Departments of Pathology and Biomedical Informatics, where I conducted grant-funded  
3 research, taught courses and advised graduate students and medical and post-doctoral  
4 fellows. I have over 54 peer-reviewed publications and have served as Associate Editor  
5 and Editor-in-Chief on two journals. I currently serve as the Founding Editor-in-Chief  
6 of the journal *Science, Public Health Policy & the Law*. I append a biosketch (a form a  
7 curriculum vitae) should it be helpful to the Court. (Attached hereto as Exhibit 5)

8 3. Plaintiffs contacted me and asked if I would be willing to offer my expert  
9 opinion about the risks teachers and students face upon returning to school, and the harms  
10 students suffer as a result of being denied in-person educational opportunities.

11 **Children have a very low risk of serious or critical illness and death from SARS-**  
12 **CoV-2 infection, and they do not pose a severe risk of transmission to adults.**

13 4. The CDC estimate of the population-wide death rate of COVID-19 is  
14 0.26%<sup>1</sup>. However, the vast majority of this risk is in the elderly and in people whose  
15 overall health has been significantly deteriorated prior to infection (e.g., individuals with  
16 pre-existing chronic pulmonary illness, whose death rate is 6.3%, cardiovascular illness  
17 (10.5%), high blood pressure (6%), adults with diabetes (7.3%), and cancer (5.6%)<sup>2</sup>.  
18 Even these rates—which are from the earliest reports in the outbreak, from Wuhan City  
19 in Hubei Province, China—are massively inflated because they are only *symptomatic*  
20 case fatality rates, not infection case fatality rates. After the peak infection wave subsided  
21  
22  
23

24 <sup>1</sup> USA Today, *Fact check: CDC's estimates COVID-19 death rate around .26%,*  
25 *doesn't confirm it* (June 5, 2020),

26 <https://www.usatoday.com/story/news/factcheck/2020/06/05/fact-check-cdc-estimates-covid-19-death-rate-0-26/5269331002/>

27 <sup>2</sup> Business Insider, *The coronavirus is scary to millennials because it shows us how old*  
28 *our parents are* (Mar. 16, 2020)

<https://markets.businessinsider.com/news/stocks/coronavirus-age-differences-millennials-parents-health-social-distancing-2020-3-1029000036>



1 in the China, scientists there estimated that as many as 85% of COVID-19 cases were  
2 undetected.<sup>3</sup>

3 5. Even the attribution of death to COVID-19 is still in question, and it is  
4 unlikely that we will be able to determine an accurate count of those who “died from” the  
5 infection, as opposed to “died with” the infection. In Italy, 99% of deaths have had a  
6 significant comorbid condition<sup>4</sup>. Also, late-stage treatment of patients critically ill with  
7 COVID-19 initially involved ventilator use, which may have exacerbated the mortality  
8 rate. It has been observed that high-pressure “per protocol” use of ventilators in COVID-  
9 19 patients with severe infections, showing inflammation to the periphery of the alveoli,  
10 may cause further tissue damage to the patients’ already inflamed and thinned-out lung  
11 epithelial layers<sup>5,6</sup>.

12 6. Unlike pneumonia from influenza viruses, in which the risk of the death to  
13 children is increased, COVID-19 death rates are effectively zero for children aged 0-10  
14 and adolescents ages 11-20. Early data from South Korea, for example, reported zero  
15 deaths for children aged 0 to 20 – the same rate indicated by data from Italy<sup>7</sup>. The CDC<sup>8</sup>  
16 reports a total of 226 “COVID-19 deaths” in persons under 24 across the US, out of total  
17 of 26,808 deaths for that age group over the same time period from all causes. Thus,  
18

19 <sup>3</sup> MedPage Today, *Over 85% of COVID-19 Infections in China Went Undetected Early*  
20 *on* (Mar. 16, 2020) <https://www.medpagetoday.com/infectiousdisease/covid19/85448>

21 <sup>4</sup> Bloomberg, *99% of Those Who Died From Virus Had Other Illness, Italy says* (Mar.  
22 *18, 2020)*, [https://www.bloomberg.com/news/articles/2020-03-18/99-of-those-who-](https://www.bloomberg.com/news/articles/2020-03-18/99-of-those-who-died-from-virus-had-other-illness-italy-says)  
23 [died-from-virus-had-other-illness-italy-says](https://www.bloomberg.com/news/articles/2020-03-18/99-of-those-who-died-from-virus-had-other-illness-italy-says)

24 <sup>5</sup> Time, *Why Ventilators May Not Be Working as Well for COVID-19 Patients as*  
25 *Doctors Hoped* (April 16, 2020), <https://time.com/5820556/ventilators-covid-19/>

26 <sup>6</sup> The Wall Street Journal, *Some Doctors Pull Back on Using Ventilators to Treat*  
27 *COVID-19* (May 11, 2020), [https://www.wsj.com/articles/some-doctors-pull-back-on-](https://www.wsj.com/articles/some-doctors-pull-back-on-using-ventilators-to-treat-covid-19-11589103001)  
28 [using-ventilators-to-treat-covid-19-11589103001](https://www.wsj.com/articles/some-doctors-pull-back-on-using-ventilators-to-treat-covid-19-11589103001)

<sup>7</sup> Spruce, *A Tale of Two Death Rates: How South Korea and Italy Predict Our COVID-19 Future* (Mar. 14, 2020) [https://blog.sprucehealth.com/a-tale-of-two-death-rates-how-](https://blog.sprucehealth.com/a-tale-of-two-death-rates-how-south-korea-and-italy-predict-our-covid-19-future/)  
[south-korea-and-italy-predict-our-covid-19-future/](https://blog.sprucehealth.com/a-tale-of-two-death-rates-how-south-korea-and-italy-predict-our-covid-19-future/)

<sup>8</sup> Centers for Disease Control and Prevention (July 22, 2020),  
[https://data.cdc.gov/NCHS/Provisional-COVID-19-Death-Counts-by-Sex-Age-and-](https://data.cdc.gov/NCHS/Provisional-COVID-19-Death-Counts-by-Sex-Age-and-S/9bhg-hcku)  
[S/9bhg-hcku](https://data.cdc.gov/NCHS/Provisional-COVID-19-Death-Counts-by-Sex-Age-and-S/9bhg-hcku)

1 COVID-19 currently accounts for 0.84% of all deaths in people aged 0 to 24 year. This  
2 does not come close to meeting the criterion used to classify infectious diseases as an  
3 “epidemic” (between 6 and 7%). By comparison, influenza and pneumonia not attributed  
4 to COVID-19 led to 966 deaths over the same time period in persons aged 0 to 24.<sup>9</sup>

5 7. Nationwide, although there are now over 4 million confirmed cases in the  
6 United States, there have been only 226 deaths for those “under 24 years of age”  
7 attributed to COVID-19 infection, amounting to 0.173% of all deaths from COVID-19.  
8 Scientists now believe Children may be largely immune to SARS-CoV-2 infection due  
9 to an evolutionary conserved and balanced innate immune response, whereas adult  
10 response to COVID-19 may elicit the adaptive antibody-based immune system due to  
11 larger prior exposure to a variety of coronaviruses relative to our youth<sup>10</sup>.

12 8. ACE2 receptors are one of two portals the SARS-CoV-2 virus uses to gain  
13 entry into lung cells. Children may also express a different form of ACE2 receptor, or  
14 different amounts of ACE2 receptors than adults.<sup>11</sup> Smokers, and adults on ACE2  
15 inhibitors produce a larger density of ACE2 receptors on the surfaces of their lung  
16 epithelia; this may be why people with cardiovascular disease, hypertension and smokers  
17 are at higher risk of serious illness and death from COVID-19 than children.

18 9. Underscoring the low risk to children, Dr. Anthony Fauci, Director of the  
19 US NIAID, has reported that children are unlikely to be among the first individuals to  
20 receive any COVID-19 vaccine found to be safe and effective, and on June 3, 2020,  
21 suggested that it would be appropriate to re-open schools<sup>12</sup>.

22  
23  
24 <sup>9</sup> *Id.*

25 <sup>10</sup> The Scientist, *Possible Biological Explanations for Kids’ Escape from COVID-19*  
26 (Mar. 16, 2020), <https://www.the-scientist.com/news-opinion/possible-biological-explanations-for-kids-escape-from-covid-19-67273>

27 <sup>11</sup> Malgorzata Kloc, et al., ScienceDirect, *Development of child immunity in the context*  
28 *of COVID-19 pandemic*, Volume 17, August 2020,  
<https://www.sciencedirect.com/science/article/pii/S1521661620305106>

<sup>12</sup> CNN, *Fauci says it’s time to think about reopening schools* (June 4, 2020)  
<https://www.cnn.com/2020/06/03/us/fauci-schools-reopening-coronavirus/index.html>

1           10. Deaths in the US and elsewhere from COVID-19 are restricted to individuals  
2 that have potential indicators of expected severity. The medical literature of factors that  
3 place individuals at risk of serious illness and mortality from COVID-19 include an  
4 altered immune system (specifically Th2-skewed immunity vs. Th1/Th2 balanced  
5 immunity<sup>13</sup>). Patients who progress to serious COVID-19 in need of critical care undergo  
6 a type of inflammatory response known as a cytokine storm, involving cytokines IL-1 $\beta$ ,  
7 TNF- $\alpha$  and IL-6.<sup>14</sup> Clinical care does not yet make use of an assay to determine patients'  
8 Th2/Th1 balance, but a combined risk model that includes comorbidity, age and Th2/Th1  
9 cell counts could be useful in predicting the clinical course of SARS-CoV-2 infections,  
10 reducing mortality and streamlining resource allocation. This means we can expect  
11 improved clinical care of COVID-19 patients and lower serious illness and death as  
12 effective and tailored treatments come online.

13           *Current Case Fatality Rates and Infection Case Fatality Rates Are Dropping.*

14           11. Although immunity to SARS-CoV-2 following infection was originally in  
15 doubt due to waning presence of antibodies in people previously infected<sup>15</sup>, this concern  
16 is likely overblown; long-term immunity of COVID-19 is now suspected to involve  
17 memory B-cell and T-cell immunity, like other viruses. The very best resource available  
18 on this complex issue of antibody vs. T- and B-cell immunity for the layperson is the  
19  
20  
21

22           <sup>13</sup> Wong, BioCentury, *Haste plus speed: the need to ensure COVID-19 vaccines don't*  
23 *make infections worse* (Mar. 24, 2020),

24 <https://www.biocentury.com/article/304604/how-covid-19-vaccine-developers-can-lower-the-risk-of-being-derailed-by-antibody-dependent-enhancement>

25           <sup>14</sup> Betsy Susan Johnson, Malini Laloraya, ScienceDirect (July 1, 2020), *Cytokine Storm*  
26 *in COVID-19 patients transforms to a Cytokine Super Cyclone in patients with risk*  
27 *factors*, <https://www.sciencedirect.com/science/article/pii/S1359610120301167>

28           <sup>15</sup> Reuters, *Swiftly waning COVID-19 immunity poses vaccination challenge* (July 14,  
2020), <https://www.reuters.com/article/us-health-coronavirus-antibodies-vaccine-idUSKCN24F261>

1 July, 20<sup>th</sup> 2020 article in *The Atlantic* by Mr. Derek Thompson.<sup>16</sup> In short, the fear over  
2 re-infection is false, anecdote-based and rejected by the absences of millions of repeat  
3 diagnoses of COVID-19 among those previously infected.

4 12. Due to a surge in testing, more asymptomatic COVID-19 “cases” are being  
5 detected. Cross-protection from prior exposure to coronaviruses, including the common  
6 cold, is now highly suspected to already have conferred immunity from COVID-19  
7 symptomatic disease. The cross-protection may be so effective that in the UK, herd  
8 immunity may already have been achieved.<sup>17</sup>

9 13. Herd immunity is general immunity in the population achieved when a  
10 sufficient number of individuals are immune, either through natural infection or via  
11 vaccination to cause viral transmission to end. One estimate from the UK is that only  
12 10% infection in a population might provide herd immunity due to such high prior cross-  
13 protection due to exposure to other coronaviruses.<sup>18</sup> Eventually, with or without a  
14 vaccine, the population will achieve herd immunity, and during that process, the  
15 vulnerable – those with comorbid conditions, those with Th2 skewed immunity, and the  
16  
17  
18  
19  
20  
21

---

22 <sup>16</sup> Derek Thompson, *How Long Does COVID-19 Immunity Last?* (July 20, 2020),  
23 [https://www.theatlantic.com/ideas/archive/2020/07/could-covid-19-immunity-really-  
24 disappear-months/614377/](https://www.theatlantic.com/ideas/archive/2020/07/could-covid-19-immunity-really-disappear-months/614377/)

25 <sup>17</sup> Daily Mail, *Britain could ALREADY have herd immunity against the coronavirus*  
26 *because so many people have had similar illnesses in the past, study claims* (July 17,  
2020), [https://www.dailymail.co.uk/news/article-8532935/Britain-herd-immunity-  
27 against-coronavirus.html](https://www.dailymail.co.uk/news/article-8532935/Britain-herd-immunity-against-coronavirus.html)

28 <sup>18</sup> Xiao-yan Che, et al., *Antigenic Cross-Reactivity between Severe Acute Respiratory*  
*Syndrome—Associated Coronavirus and Human Coronaviruses 229E and OC43*,  
Journal of Infectious Diseases, Volume 191, Issue 12, (June 15, 2020),  
<https://academic.oup.com/jid/article/191/12/2033/839720>

1 elderly, should be cautious about exposure and become educated and ask their doctors  
2 for recently reported, safer, potentially highly effective treatment options<sup>19,20,21</sup>.

3 *Children Are Not A Significant Source of Transmission.*

4 14. The CDC has published a report on the age distribution of transmission to  
5 new cases in South Korea, which found that less than 1% of new transmissions detected  
6 in the study were attributed to children aged 0 to 10 years; similarly, less than 1% of new  
7 transmissions were from children aged 11 to 20 years.<sup>22</sup> Within household transmissions,  
8 the rates were higher among children than adults, but overall, children accounted for 1.3%  
9 of all new transmissions detected.<sup>23</sup> There were two significant limitations in the study;  
10 the authors could not determine directionality of transmission (child-adult, adult-child),  
11 and the contact tracing that occurred in a population that was, if exposed, put into 14-day  
12 quarantine, meaning close, prolonged contact of infected, primarily symptomatic  
13 individuals within households.<sup>24</sup> The study authors tested all of the household contacts of  
14 each patient, regardless of symptoms, but only tested symptomatic contacts outside the  
15 household; this could bias the results by increasing the apparent number of total  
16 transmissions from (or to) children, due to intimate care of the ill in households.

17 \_\_\_\_\_  
18 <sup>19</sup> David Brownstein, M.D., et al., Science, Public Healthy Policy and the Law, *A Novel*  
19 *Approach to Treating COVID-19 Using Nutritional and Oxidative Therapies* (  
<https://www.publichealthpolicyjournal.com/clinical-and-translational-research>

20 <sup>20</sup> Philippe Gautret, et al., *Clinical and microbiological effect of a combination of*  
21 *hydroxychloroquine and azithromycin in 80 COVID-19 patients with at least a six-day*  
22 *follow up: an observational study*, [https://www.mediterranee-infection.com/wp-](https://www.mediterranee-infection.com/wp-content/uploads/2020/03/COVID-IHU-2-1.pdf)  
[content/uploads/2020/03/COVID-IHU-2-1.pdf](https://www.mediterranee-infection.com/wp-content/uploads/2020/03/COVID-IHU-2-1.pdf)

23 <sup>21</sup> Daily Mail, *Triple-drug combo of anti-malaria pill hydroxychloroquine, azithromycin*  
24 *and ZINC improved coronavirus patients' chances of being discharged and cut death*  
25 *risk by almost 50%, study finds* (May 11, 2020)  
[https://www.dailymail.co.uk/health/article-8309337/Zinc-hydroxychloroquine-](https://www.dailymail.co.uk/health/article-8309337/Zinc-hydroxychloroquine-effective-COVID-19-patients-study.html)  
[effective-COVID-19-patients-study.html](https://www.dailymail.co.uk/health/article-8309337/Zinc-hydroxychloroquine-effective-COVID-19-patients-study.html)

26 <sup>22</sup> [Centers for Disease Control and Prevention, \*Contact Tracing During Coronavirus\*](https://wwwnc.cdc.gov/eid/article/26/10/20-1315_article)  
27 [Disease Outbreak, South Korea, 2020](https://wwwnc.cdc.gov/eid/article/26/10/20-1315_article), [https://wwwnc.cdc.gov/eid/article/26/10/20-](https://wwwnc.cdc.gov/eid/article/26/10/20-1315_article)  
28 [1315\\_article](https://wwwnc.cdc.gov/eid/article/26/10/20-1315_article)

<sup>23</sup> *Id.*

<sup>24</sup> *Id.*



1           15. The data from this study has been grossly misinterpreted because they rely  
 2 on per-age group apparent rates of transmission. If the total number of transmissions  
 3 detected by the study are considered, children aged 10-19 are responsible for (at most)  
 4 0.406% of transmissions, far more similar to the 0-9 age group than to adults. (See Their  
 5 Table 2; age 0-9 had 2 of 180 tracked people transmitting vs. age 10-19 had 2 of 226  
 6 people tracked transmitting).

Age Group	% Total Transmission
0-9	0.371
10-19	0.406
20-29	25.563
30-39	15.279
40-49	16.419
50-59	19.200
60-69	15.369
70-79	3.944
>80	3.391
<b>Total</b>	<b>100%</b>

7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
*Hypothetical Risk to Teachers.*

18           16. The only elevated risks to teachers appear to be a hypothetical possibility of  
 19 increased risk of miscarriage if the teacher is pregnant and becomes infected with SARS-  
 20 CoV-2, and a potential increased risk of hospitalization relative to the full population if  
 21 pregnant.<sup>25</sup> However, CDC has supported (without FDA approval) the use of both the  
 22 influenza vaccine and the Tdap vaccine during pregnancy. A study has found that  
 23 military personnel who received the flu vaccine had 36 percent increased risk for  
 24  
 25  
 26  
 27

28 <sup>25</sup> CNN, *Coronavirus infection may make pregnant women more severely ill, CDC says*  
 (June 25, 2020) <https://www.cnn.com/2020/06/25/health/coronavirus-pregnant-risks-cdc-study/index.html>

1 coronavirus.<sup>26</sup> Other studies support the conclusion of increased risk of viral infections-  
2 especially respiratory viral infections – following the influenza shot.<sup>27,28,29</sup>

3 17. According to the chief medical officer for England, people in the UK who  
4 have received the influenza vaccine for this flu season were cautioned to self-isolate for  
5 12 weeks because they fall into the government’s “high risk” category for acquiring a  
6 SARS-CoV-2 infection.<sup>30</sup> This “disease enhancement” from a vaccine is known as  
7 “pathogenic priming<sup>31</sup>” which may occur in part due to antibody dependent enhancement.  
8 It has inaccurately been referenced as “immune enhancement.”

9 18. **Conclusion:** Contrary to the representation of risk in the mainstream media,  
10 there is minimal risk to teachers and students to return to school due to Coronavirus.  
11 Teachers receiving vaccinations during pregnancy may be at higher risk to complications  
12 if they are vaccinated and become infected with SARS-CoV-2.

13 \_\_\_\_\_  
14 <sup>26</sup> Greg G. Wolf, *Influenza vaccination and respiratory virus interference among*  
15 *Department of Defense personnel during the 2017-2018 influenza season*, Vaccine,  
16 Volume 38, Issue 30 (June 19, 2020),

17 <https://www.sciencedirect.com/science/article/pii/S0264410X19313647?via%3Dihub>

18 <sup>27</sup> Sharon Rikin, et al., *Assessment of temporally-related acute respiratory illness*  
19 *following influenza vaccination*, Vaccine, Volume 36, Issue 15 (April 5, 2018),

20 <https://www.sciencedirect.com/science/article/pii/S0264410X18303153>

21 <sup>28</sup> Heath Kelly, et al., *Vaccine Effectiveness Against Laboratory-confirmed Influenza in*  
22 *Healthy Young Children: A Case-Control Study*, The Pediatric Infectious Disease

23 *Journal*, February 2011, [https://insights.ovid.com/pediatric-infectious-](https://insights.ovid.com/pediatric-infectious-disease/pidj/2011/02/000/vaccine-effectiveness-against-laboratory-confirmed/4/00006454)

24 [disease/pidj/2011/02/000/vaccine-effectiveness-against-laboratory-](https://insights.ovid.com/pediatric-infectious-disease/pidj/2011/02/000/vaccine-effectiveness-against-laboratory-confirmed/4/00006454)  
25 [confirmed/4/00006454](https://insights.ovid.com/pediatric-infectious-disease/pidj/2011/02/000/vaccine-effectiveness-against-laboratory-confirmed/4/00006454)

26 <sup>29</sup> Benjamin J. Cowling, et al., *Increased Risk of Noninfluenza Respiratory Virus*  
27 *Infections Associated with Receipt of Inactivated Influenza Vaccine*, Clinical Infectious  
28 *Diseases*, Volume 54, Issue 12 (June 15, 2012),

29 <https://academic.oup.com/cid/article/54/12/1778/455098>

30 *Mirror*, *Coronavirus: Top medic warns anyone who gets the flue jab should stay at*  
31 *home* (Mar. 17, 2020), [https://www.mirror.co.uk/news/uk-news/coronavirus-top-medic-](https://www.mirror.co.uk/news/uk-news/coronavirus-top-medic-warns-anyone-21708701)  
32 [warns-anyone-21708701](https://www.mirror.co.uk/news/uk-news/coronavirus-top-medic-warns-anyone-21708701)

33 <sup>31</sup> James Lyons-Weiler, *Pathogenic priming likely contributes to serious and critical*  
34 *illness and mortality in COVID-19 via autoimmunity*, *Journal of Translational*  
35 *Autoimmunity*, Volume 3, 2020,

36 <https://www.sciencedirect.com/science/article/pii/S2589909020300186?via%3Dihub>

1                   **Closing schools in the Fall will have negative consequences**  
2   **for children and their families.**

3           19.    There are real, established risks to keeping schools closed this Fall, due  
4 primarily to isolation but also to the loss of normative practices in development and  
5 learning.

6           20.    *Schools are opening around the world.* California has a responsibility  
7 among the other 49 states to ensure that our students are not falling behind students  
8 around the world. Netherlands reopened in April, and had not enforced social distancing  
9 for children under twelve years of age. Due to the positive outcomes, they recently stated  
10 they will no longer be enforcing social distancing for children under the age 17.<sup>32</sup>

11           21.    Denmark, Finland, and Belgium have all also opened without issue. Austria  
12 and Germany have reopened. Belgium out for summer but due to positive outcomes will  
13 be back to full capacity classes when back in session in Fall. There has been one small  
14 outbreak in Germany, with no plans to re-close schools, and Germany plans to drop social  
15 distancing standards for students and resume at full capacity classes. Italy has pledged  
16 to reopen schools.<sup>33</sup>

17           22.    In the UK, pediatricians have pleaded for schools to remain open. In an open  
18 letter from 1,500 physicians to their government, they report that they are hoping to avoid  
19  
20  
21  
22  
23

---

24           <sup>32</sup> Jennifer Couzin-Frankel, *School openings across globe suggest ways to keep*  
25 *coronavirus at bay, despite outbreaks* (July 7, 2020),  
26 [https://www.sciencemag.org/news/2020/07/school-openings-across-globe-suggest-](https://www.sciencemag.org/news/2020/07/school-openings-across-globe-suggest-ways-keep-coronavirus-bay-despite-outbreaks)  
27 [ways-keep-coronavirus-bay-despite-outbreaks.](https://www.sciencemag.org/news/2020/07/school-openings-across-globe-suggest-ways-keep-coronavirus-bay-despite-outbreaks)

28           <sup>33</sup> Ashleigh Furlong, *School reopenings in Europe reduce virus concerns – mostly,*  
American Association for the Advancement of Science  
[https://www.politico.com/news/2020/06/10/european-school-reopeningsreduce-virus-](https://www.politico.com/news/2020/06/10/european-school-reopeningsreduce-virus-concerns-for-most-312595)  
[concerns-for-most-312595.](https://www.politico.com/news/2020/06/10/european-school-reopeningsreduce-virus-concerns-for-most-312595)



1 “scarring the life chances of a generation of young people.”<sup>34</sup> UK listened to the  
2 pediatricians and have reopened schools on a voluntary basis.<sup>35</sup>

3 23. It is abundantly clear that children under twelve years of age are not  
4 transmitting in schools. Schools across Asia are doing well, including Japan and South  
5 Korea; indeed, in Japan, classes are now back to full capacity due to positive outcomes.

6 24. If California does not open schools in the fall, the State could represent a  
7 liability for the rest of the country if other States follow suit. Currently, New York State  
8 plans to reopen with provisions for distance learning for those students who must stay  
9 home – a continuation of the program in place for children who are immunocompromised  
10 due to chemotherapy or genetics and must stay home to avoid any infection.

11 25. *Absence of Peer-to-Peer Relationships.* According to a report from The  
12 Pennsylvania State University<sup>36</sup>, “Peer relationships provide a unique context in which  
13 children learn a range of critical social emotional skills, such as empathy, cooperation,  
14 and problem-solving strategies. Peer relationships can also contribute negatively to  
15 social emotional development through bullying, exclusion, and deviant peer processes.  
16 Universal, school-based, social emotional learning programs provide a strong foundation  
17 for promoting healthy social emotional development and creating positive peer cultures.  
18 Children experiencing peer difficulties often need additional, systematic, and intensive  
19 social skill coaching. Peers can be powerful forces that facilitate or alternatively  
20 undermine group programs.” The report concluded that *Research points to the need to*

21 \_\_\_\_\_  
22 <sup>34</sup> *Open letter from UK Paediatricians about the return of children to schools* (June 17,  
23 2020) [https://www.rcpch.ac.uk/sites/default/files/2020-06/open\\_letter\\_re\\_schools\\_reopening\\_2020-06-17.pdf](https://www.rcpch.ac.uk/sites/default/files/2020-06/open_letter_re_schools_reopening_2020-06-17.pdf).

24 <sup>35</sup> Michael Birnbaum, *Reopened schools in Europe and Asia have largely avoided*  
25 *coronavirus outbreaks. They have lessons for the U.S.*, The Washington Post (July 11,  
26 2020), [https://www.rcpch.ac.uk/sites/default/files/2020-06/open\\_letter\\_re\\_schools\\_reopening\\_2020-06-17.pdf](https://www.rcpch.ac.uk/sites/default/files/2020-06/open_letter_re_schools_reopening_2020-06-17.pdf)

27 <sup>36</sup> Pepler D, and Bierman K, Pennsylvania State University, *With a Little Help from my*  
28 *Friends—The Importance of Peer Relationships for Social-Emotional Development*,  
Politico (Dec. 5, 2018), <https://www.rwjf.org/en/library/research/2018/11/with-a-little-help-from-my-friends--the-importance-of-peer-relationships-for-social-emotional-development.html>

1 *not only promote the development of critical social-emotional capacities, but also attend*  
2 *to and create positive peer processes to ensure that every child is able to engage in and*  
3 *benefit from healthy relationships at home, school, peer group, and community.*

4 26. The importance of peer-peer interactions during social development are well  
5 known. On July 21, 2020, The Secretary of California's Health & Human Services  
6 Agency, Mark Ghaly, explained how important it is for children to work in teams and be  
7 a part of groups.<sup>37</sup> Opportunities for this socialization are not likely to occur via distance  
8 learning, a non-normative approach to childhood education. Learning these skills does  
9 not end at age 10. Californians should be concerned about the ability of their states'  
10 children to learn and hone adaptive and optimal social skills at all ages.

11 27. *Isolation/Loneliness.* Like anyone, children who are socially isolated can  
12 often develop low self-esteem, as they search for identity with a social group of friends  
13 and may find it difficult to easily and readily engage in joint problem solving. They can  
14 develop a false sense that the world does not care for them, and they may have a hard  
15 time learning age-appropriateness from their peers.

16 28. Consider a quote in *The Atlantic* from Camille Farrington, an education  
17 scholar at the University of Chicago who studies the ways students' emotions and  
18 mindsets influence learning, in an article on the long-term consequences of missing  
19 school: "*(P)oor attendance itself can cause problems with healthy development because*  
20 *of the disruption it causes to academic achievement (and learning) and to social*  
21 *connections with peers and adults at school.*"<sup>38</sup>

22 29. *Psychosocial Consequences.* Beyond these obvious effects, we may also  
23 expect to observe increased incidence of acting-out behaviors as children try to cope with  
24 the psychosocial effects not only of isolation but also fear of the unknown. We may see  
25

26 \_\_\_\_\_  
27 <sup>37</sup> Secretary Mark Ghaly, MD, MPH, California Health & Human Services Agency  
(July 21, 2020) [https://www.youtube.com/watch?v=phBogH\\_sE-8](https://www.youtube.com/watch?v=phBogH_sE-8)

28 <sup>38</sup> Mikhail Zinshteyn, *The Long-Term Consequences of Missing School*, *The Atlantic*  
(Sept. 6, 2016), <https://www.theatlantic.com/education/archive/2016/09/long-term-consequences-of-missing-school/498599/>

1 increased rates of low self-esteem, depression, anxiety, concomitant increased use of  
2 psychotropic medicines, and suicide.

3 30. *Negative Influences on Scholarship.* In addition to the psychosocial and  
4 psychological effects, failure to open schools could foster a drop in the appreciation for  
5 the craft of scholarship. This could lead to increased attrition and a decrease in college  
6 enrollment.

7 31. *Future Fiscal Impact.* Due to lost opportunities and abilities to learn,  
8 students who fail to graduate from high school on time will forever be one year behind  
9 in their career development, significantly impacting their lifelong financial trajectories -  
10 including lost wages, lost contribution to their retirement accounts, etc. The same could  
11 be expected for students who graduate, but whose grades suffer due to a depreciated  
12 learning arrangement. Many families will incur an extra year – or more – of cost of  
13 dependency of high school seniors living at home for an extra year.

14 32. *Lost Scholarship Opportunities.* Athletes will lose their edge in competitive  
15 and non-competitive sports and fail to be competitive for the thousands of scholarship  
16 opportunities for access to college education both within and outside of the State of  
17 California. There are about 178,000 athletic scholarships<sup>39</sup> awarded per year across the  
18 nation; California's young, bright athletes may be left out of the running for these life-  
19 changing opportunities for athletic scholarships in CA and nationwide.

20 33. Scholarship opportunities for academically gifted students will similarly be  
21 lost, placing Californian students at a competitive disadvantage nationally. Most  
22 academically talented students will likely prove to be autodidacts – student able to learn  
23 on their own; as a result, California public schools may well lose their most gifted  
24 students to home schooling, reducing the availability positive peer role models.

25 34. *Lack of Access to Technology.* Students across the State of California  
26 benefit from access to and training in the use of technology in the classroom. Online  
27 training may be considered appealing to effect physical isolation to reduce the spread of  
28 SARS-CoV-2, and it is true that such a system would likely reduce the already very low

---

<sup>39</sup> <http://scholarshipstats.com/totalscholarships.html>

1 probability of transmission of new cases originating from children. However, such a  
2 system would place low-income students at a disadvantage, exaggerating the digital  
3 divide between the well-off and the low-income segments of the population.

4 35. Home PCs and laptops may not be available to some students because their  
5 parents may require them during school hours for employment duties. About 3.4% of the  
6 US population worked at home prior to COVID-19<sup>40</sup>; that percentage has now  
7 skyrocketed.

8 36. *Domestic Violence Risk.* Many California families are out of work due to  
9 COVID-19 and are in economic hardship due to the closure of small businesses. This  
10 leads to a strain on mental health. Indeed, California doctors reported seeing higher deaths  
11 from suicide than from COVID-19 during the most severe lockdowns.<sup>41</sup> Children may  
12 also be at increased risk of harm from physical abuse. CBS News reported that the UN  
13 estimated that six months of COVID-19 lockdown could lead to 31 million more cases  
14 of domestic violence worldwide,<sup>42</sup> with an additional 15 million every three months  
15 thereafter. Sadly, victims may feel increasingly dependent on their abusers, leading to a  
16 reduction in the number of calls to domestic abuse hotlines in California<sup>43</sup>. The safety  
17 valve of having children involved in a public forum with face-to-face contact—in which  
18 such cases of abuse can come to light, or better yet, be prevented altogether, because the  
19 perpetrator at home perceives risk of discovery—is all but lost if schools fail to open.

20  
21  
22 <sup>40</sup> <https://www.flexjobs.com/blog/post/remote-work-statistics/>

23 <sup>41</sup> Washington Examiner, *California doctors say they've seen more deaths from suicide*  
24 *than coronavirus since lockdowns* (May 21, 2020),  
25 [https://www.washingtonexaminer.com/news/california-doctors-say-theyve-seen-more-](https://www.washingtonexaminer.com/news/california-doctors-say-theyve-seen-more-deaths-from-suicide-than-coronavirus-since-lockdowns)  
26 [deaths-from-suicide-than-coronavirus-since-lockdowns.](https://www.washingtonexaminer.com/news/california-doctors-say-theyve-seen-more-deaths-from-suicide-than-coronavirus-since-lockdowns)

27 <sup>42</sup> CBS News, *6 months of coronavirus lockdown could mean 31 million more cases of*  
28 *domestic violence, UN says* (April 28, 2020),  
29 [https://www.cbsnews.com/news/domestic-violence-additional-31-million-cases-](https://www.cbsnews.com/news/domestic-violence-additional-31-million-cases-worldwide/)  
30 [worldwide/](https://www.cbsnews.com/news/domestic-violence-additional-31-million-cases-worldwide/)

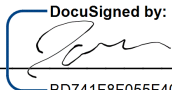
31 <sup>43</sup> ABC News, *Fewer domestic violence calls during COVID-19 outbreak has*  
32 *California officials concerned* (April 25, 2020), [https://abcnews.go.com/US/fewer-](https://abcnews.go.com/US/fewer-domestic-violence-calls-covid-19-outbreak-california/story?id=70336388)  
33 [domestic-violence-calls-covid-19-outbreak-california/story?id=70336388](https://abcnews.go.com/US/fewer-domestic-violence-calls-covid-19-outbreak-california/story?id=70336388)

1 37. *Restriction of Access to IEP Assistance.* California is home to over 795,000  
2 special needs students<sup>44</sup> who receive government-mandated individual Education  
3 Program assistance. Failing to open schools would result in a loss of access to such  
4 services to many hundreds of thousands of students. Failure of school districts to provide  
5 those services in a pedagogically effective manner denies these citizens of the rights  
6 provided by California and Federal mandates. Disenfranchisement of the disabled  
7 student, of course, means excess burdens on families of students with disabilities as well.

8 38. **Conclusion:** Having carefully studied the scientific data surrounding  
9 COVID-19 and compared it to the harm that will come to students in California should  
10 schools be not allowed to open, my conclusion is that harms inflicted on students and  
11 their parents of closing schools drastically outweigh the very low risk of harm to students  
12 from opening schools.

13  
14 I declare under penalty of perjury under the laws of the United States of America  
15 that the foregoing is true and correct.

16  
17 DATED this 27<sup>th</sup> day of July 2020

18   
19 \_\_\_\_\_  
20 BD741F8F055F40A...  
21 James Lyons-Weiler, Ph.D.

22  
23  
24  
25  
26  
27  
28  

---

44 California Department of Education, <https://www.cde.ca.gov/sp/se/sr/cefspeced.asp>

**EXHIBIT 5**



NAME James Lyons-Weiler		POSITION TITLE	
eRA COMMONS USER NAME (credential, e.g., agency login)		CEO/President/Director/Scientist Institute for Pure and Applied Knowledge	
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
State University of New York, Oswego, NY	B.A.	8, 1991	Biology
Ohio State University	M. Sc.	6, 1993	Zoology
The University of Nevada, Reno	Ph.D.	6, 1998	Ecology, Evol & Conservation Biology
Pennsylvania State University	Postdoctoral	2000	Computational Molecular Biology

**A. Personal Statement**

My research program is focused on improving healthcare via the development of treatment efficacy and risk biomarkers, optimizing clinical interventions after adverse events, and understanding the neurological and immunological basis of vaccine injuries. I have been performing collaborative research with DNA sequence data since 1996, microarray gene expression data since 1998, proteomic data since 2003, and next generation sequencing since 2009 in cancer, immunology and neurobiology. I have participated in program-level consortia including the NCI's Early Detection Research Network, caBIG, and managed a large multi-institutional consortium in Proteomics and Bioinformatics (funded via TATRC). With a deep understanding of the effects of data preprocessing algorithms on the validity of downstream statistical inferences, and fundamental comprehension of principles of ecology and evolutionary theory, I have developed novel paradigms for high-dimensional -omic analyses, including advances in statistical methods for variant calling, transcriptional profiling, machine-learning based prediction modeling, integrative translational research via decision modeling, covariate matching for case/control selection, and for the statistical evaluation of survivorship prediction models. These advances are applied via intelligent methods optimization, in which empirically optimized data analysis protocols are arrived at routinely via systematic comparative evaluative methodological research & development to insure reproducibility. I have directed the successful analysis of at least twenty-five Next Generation Sequence data sets with various applications from whole microbial and mouse genome sequencing to from various platforms for transcriptomics, variant detection, ChipSeq, methylomics, and whole genome/exome sequencing. The algorithms I have developed are current in use by many labs as they provide information measures reflective of both data quality and algorithm performance using objective evaluation measures. I have written books on Ebola, Translational Research and Autism. I founded the Institute for Pure and Applied Knowledge to conduct biomedical and translational research in the public interest.

**Positions and Honors**

- 1998-2000 AP Sloan/US Department of Energy Postdoctoral Fellow in Computational Molecular Biology
- 1998-2001 (Awarded but declined) NIH National Research Service Award in Bioinformatics
- 2000-2002 Assistant Professor, University of Massachusetts, Lowell, Department of Biological Sciences
- 2000-2002 Co-Director, Center for Bioinformatics and Computational Biology, University of Massachusetts, Lowell
- 2002-2007 Assistant Professor, University of Pittsburgh School of Medicine, Department of Biomedical Informatics; Core Faculty Member, Biomedical Informatics Training Program; Department of Pathology; Fully Associated Faculty Member, University of Pittsburgh Cancer Institute
- 2007-2014 Scientific Director, Bioinformatics Analysis Core Service, University of Pittsburgh; Adjunct Assistant Professor, Department of Biomedical Informatics, University of Pittsburgh
- 2014-present CEO/Director/Scientist, Institute for Pure and Applied Knowledge

## Other Experience and Professional Membership

2019-present Editor in Chief, *Science, Public Health Policy & the Law*  
2016-2019 Editorial Board, *Cancer Research*  
2004-present Member, *Society for Experimental Biology*  
2004-2006 Associate Editor, *Applied Bioinformatics*  
2006-2007 Founding Editor-in-Chief, *Cancer Informatics*  
2002-2012 NIH Grant reviewer  
2008-2010. Grant Review Committee, New Jersey Commission on Cancer Research  
2009 Member, The Society for Clinical and Translational Science

## B. Selected Peer-Reviewed Publications

### Most relevant to the current application

**Lyons-Weiler J.** 2020. Pathogenic Priming Likely Contributes to Serious and Critical Illness and Mortality in COVID-19 via Autoimmunity. *J Transl Autoimmun.* 2020 Apr 9:100051. doi: 10.1016/j.jtauto.2020.100051.

McFarland, G, E La Joie, P Thomas and **J Lyons-Weiler.** 2020. Acute Exposure and Chronic Retention of Aluminum in Three Vaccine Schedules and Effects of Genetic and Environmental Variation. *J Trace Elements in Medicine and Biology* 58:126444.

**Lyons-Weiler, J** 2018. Autism is an Acquired Cellular Detoxification Syndrome with Genetic Heterogeneity. *Autism Open Access* 8(1):1-15.

**Lyons-Weiler, J** and R. Ricketson. 2018. Reconsideration of the Immunotherapeutic Pediatric Safe Dose Levels of Aluminum. *Journal of Trace Elements in Medicine and Biology* 48:67-73.

Dobrowolski SF, **Lyons-Weiler J**, Spridik K, Vockley J, Skvorak K, Biery A. 2016. DNA methylation in the pathophysiology of hyperphenylalaninemia in the PAHenu2 mouse model of phenylketonuria. *Mol Genet Metab.* pii: S1096-7192(16)30001-4. doi: 10.1016/j.ymgme.2016.01.001. PMID 26822703.

Dobrowolski SF, **Lyons-Weiler J**, Spridik K, Biery A, Breck J, Vockley J, Yatsenko S, Sultana T. 2015. Altered DNA methylation in PAH deficient phenylketonuria. *Mol Genet Metab.* 115(2-3):72-7. doi: 10.1016/j.ymgme.2015.04.002. PMID: 25990862.

Ozburn AR, Falcon E, Twaddle A, Nugent AL, Gillman AG, Spencer SM, Arey RN, Mukherjee S, **Lyons-Weiler J**, 2014. Self DW, McClung CA. 2014 Direct Regulation of Diurnal Drd3 Expression and Cocaine Reward by NPAS2. *Biol Psychiatry.* pii: S0006-3223(14)00594-0. doi: 10.1016/j.biopsych.2014.07.030. PMID: 25444159.

Zubenko GS, Hughes HB 3rd, Jordan RM, **Lyons-Weiler J**, Cohen BM. 2014. Differential hippocampal gene expression and pathway analysis in an etiology-based mouse model of major depressive disorder. *Am J Med Genet B Neuropsychiatr Genet.* 165(6):457-66. doi: 10.1002/ajmg.b.32257. PMID: 25059218.

Dobrowolski, SF, A. Biery, K Sprydik, E. Kranik, K. Skvorak, J. Vockley, **J. Lyons-Weiler**, T. Sultana. 2014. Methylome repatterning in a mouse model of Maternal PKU Syndrome. *Molecular Genetics and Metabolism* 113(3):194-9. doi: 10.1016/j.ymgme.2014.08.006.

Shin SS, Bales JW, Yan HQ, Kline AE, Wagner AK, **Lyons-Weiler J**, Dixon CE. 2013. The effect of environmental enrichment on substantia nigra gene expression after traumatic brain injury in rats. *J Neurotrauma.* 30:259-70. PMID 23094804

Tanaka Y, Shigemura N, Kawamura T, Noda K, Isse K, Stolz DB, Billiar TR, Toyoda Y, Bermudez CA, **Lyons-Weiler J**, Nakao A. 2012. Profiling molecular changes induced by hydrogen treatment of lung allografts prior to procurement. *Biochem Biophys Res Commun.* 425:873-9. PMID 22902635

Hsu E, Shi H, Jordan RM, **Lyons-Weiler J**, Pilewski JM, Feghali-Bostwick CA. 2011. Lung tissues in patients with systemic sclerosis have gene expression patterns unique to pulmonary fibrosis and pulmonary hypertension. *Arthritis Rheum.* 63:783-94. PMID 21360508

Founds SA, Shi H, Conley YP, Jeyabalan A, Roberts JM, **Lyons-Weiler J.** 2012. Variations in discovery-based preeclampsia candidate genes. *Clin Transl Sci.* 5:333-9. PMID 22883611

Montecalvo A, Larregina AT, Shufesky WJ, Stolz DB, Sullivan ML, Karlsson JM, Baty CJ, Gibson GA, Erdos G, Wang Z, Milosevic J, Tkacheva OA, Divito SJ, Jordan R, **Lyons-Weiler J**, Watkins SC, Morelli AE. 2012. Mechanism of transfer of functional microRNAs between mouse dendritic cells via exosomes.



*Blood*. 119:756-66. PMID 22031862.

Hsu E, Shi H, Jordan RM, **Lyons-Weiler J**, Pilewski JM, Feghali-Bostwick CA. 2011. Lung tissues in patients with systemic sclerosis have gene expression patterns unique to pulmonary fibrosis and pulmonary hypertension. *Arthritis Rheum*. 63:783-94. PMID 21360508

Sultana, T., R. Jordan & **J. Lyons-Weiler**. 2009. Optimization of the use of consensus methods for the detection and putative identification of peptides via mass-spectrometry using protein standard mixtures. *J. of Proteomics & Bioinformatics* 2:262-273. PMID 19779596

<http://www.omicsonline.com/ArchiveJPB/2009/June/02/JPB2.262.html>

Davies, M.L., S. Xu, **J. Lyons-Weiler**, A. Rosendorff, L.R. Wasil; S.A. Webber, D. Metes, D.T. Rowe. 2011. Cellular factors associated with latency and spontaneous Epstein-Barr virus reactivation in B-lymphoblastoid cell lines. *Virology* 400:53-67. PMID 20153012

#### **Additional recent publications of importance to the field (in chronological order)**

Dagda RK, Sultana T, **Lyons-Weiler J**. 2010. Evaluation of the consensus of four peptide identification algorithms for tandem mass spectrometry based proteomics. *J Proteomics & Bioinformatics* 3:39-47. PMID 20589240.

Founds SA, Conley YP, Lyons-Weiler JF, Jeyabalan A, Allen Hogge W, Conrad KP. 2009. Altered global gene expression in first trimester placentas of women destined to develop preeclampsia. *Placenta*. 30:15-24. PMID19027158

Ranganathan S, Polshyna A, Lutka F, Nicholl G, **Lyons-Weiler J**, and Bowser R. Assessment of protein stability in cerebrospinal fluid by mass spectrometry based proteomics. *Clinical Proteomics* 2:91-101.

<http://www.springerlink.com/content/81778847577u8h73/> PMID 20200596

**Lyons-Weiler, J**, S Patel and S Bhattacharya. 2003. A classification-based machine learning approach for the analysis of genome-wide expression data. *Genome Research* 13:503-512. PMID 12618382

Bhattacharya, S, D Long, **J Lyons-Weiler**. 2004. Overcoming confounded controls in the analysis of gene expression data from microarray experiments. *Applied Bioinformatics* 2:197-208. PMID 15130791

Patel, S, **J Lyons-Weiler**. 2004. caGEDA: A web application for the integrated analysis of global gene expression patterns in cancer. *Applied Bioinformatics* 3:49-62. PMID 16323966

**Lyons-Weiler, J**, S Patel, MJ Becich and T Godfrey. 2004. Tests for finding complex patterns of differential expression in cancer: towards individualized medicine. *BMC Bioinformatics*,5:110. PMID 15307894

**Lyons-Weiler, J**, R Pelikan, HJ Zeh, III, DC Whitcomb, DE Malehorn, WL Bigbee, and M Hauskrecht. 2005. Assessing the statistical significance of the achieved classification error of classifiers constructed using serum peptide profiles, and a prescription for random sampling repeated studies for massive high-throughput genomic and proteomic studies. *Cancer Informatics* 1(1) 53-77. PMID19325865

Shi H, **Lyons-Weiler J**. 2007. Clinical decision modeling system. *BMC Med Inform Decis Mak*. Aug 13;7(1):23. PMID17697328

Jordan R, Patel S, Hu H, and **Lyons-Weiler J**. 2008. Efficiency analysis of competing tests for finding differentially expressed genes in lung adenocarcinoma. *Cancer Informatics*, 6: 389-421. [http://www.la-press.com/journal.php?journal\\_id=10&issue\\_id=101](http://www.la-press.com/journal.php?journal_id=10&issue_id=101) PMID 19259419

Berty, H.P., H. Shi & **J. Lyons-Weiler**. 2010. Determining the statistical significance of survivorship prediction models. *J. Clinical Evaluation* 16:155-165.

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT**  
 14 **CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF SEAN G. KAUFMAN IN SUPPORT OF MOTION FOR PRELIMINARY INJUNCTION**

Judge: Hon. Dean D. Pregerson

21 **DECLARATION OF SEAN G. KAUFMAN**

22 I, Sean G. Kaufman, declare as follows:

23 1. I am a certified public health professional (CPH), behaviorist, health  
 24 education and infectious disease specialist, with particular expertise in both behavioral-  
 25 based training and infectious disease risk mitigation in clinical, laboratory and other  
 26 public health settings. I make this declaration of personal, firsthand knowledge, and if  
 27 called and sworn as a witness could and would testify competently thereto.



1           2.     I received my Bachelor of Arts and Sciences in Psychology in 1996 from  
2 San Diego State University in San Diego, California. In 1999, I received my Master in  
3 Public Health in Health and Human Behavior, also from San Diego State University in  
4 San Diego California.

5           3.     From 1997 to 1999, I was employed as a Project Manager and Health  
6 Education Specialist at San Diego State University in San Diego, California, serving in  
7 the Student Health Services Office of Health Promotion. In that role, I provided  
8 training programs, counseling and patient services for a variety of health issues.

9           4.     From 1999 through 2006, I worked for the Centers for Disease Control and  
10 Prevention (“CDC”) in Atlanta, Georgia, serving during my tenure in CDC’s National  
11 Center for HIV, AIDS and Tuberculosis, CDC’s National Center for Infectious  
12 Diseases, CDC’s Office of Terrorism and Emergency Response and the Office of the  
13 Director of the CDC. While with the CDC, I assisted with the CDC’s response to HIV,  
14 the 9/11 and 2001 anthrax attacks, the West Nile Virus, SARS and monkeypox. I  
15 received a Distinguished Service Award from the United States Department of Health  
16 and Human Services in 2002 for outstanding contributions and public health activities  
17 in response to the 9/11 and subsequent anthrax attacks. I also received a Distinguished  
18 Service Award from the United States Department of Health and Human Services in  
19 2003 for outstanding contributions and public health activities in response to the 2003  
20 SARS outbreak.

21           5.     From 2004 through 2014, I served as Senior Associate and Director of the  
22 Science and Safety Training Program in the Rollins School of Public Health at Emory  
23 University in Atlanta, Georgia. During my association with Emory University, I  
24 developed and directed the Biosafety Laboratory 3 (“BSL3”) and BSL4 Science and  
25 Safety Training Program along with the ONSITE program, all of which programs  
26 trained individuals both domestically and internationally to work safely in and support  
27 high-containment laboratories equipped to handle the most infectious and dangerous  
28 biological agents in the world. While associated with Emory University, I trained and

1 managed those who clinically treated the first two Ebola patients in the United States  
2 working at the Emory University Isolation Unit during the 2014 Ebola outbreak.

3 6. From 2011 through the present, I have served as the Founding Partner,  
4 President and Chief Executive Officer of Safer Behaviors (USA), where I serve as an  
5 expert consultant in behavioral-based training around infectious diseases in clinical and  
6 laboratory settings. In that role, I develop, manage, implement, and deliver a wide  
7 range of services for people working with and around infectious diseases, including  
8 those in laboratories, healthcare settings, and high-containment work environments,  
9 Applied Laboratory Emergency Response Training (ALERT) Programs for first  
10 responders, Personal Protective Equipment (“PPE”) Training Programs, Emergency  
11 Communication Leadership Programs, and Biological Risk Mitigation Training for  
12 those serving on the frontline of emerging infectious diseases. .

13 7. Since 2014, I have provided Advanced Biological Risk Mitigation  
14 Training Programs with the American Society for Microbiology (ASM), National  
15 Institutes of Health (NIH), Fogarty International Center, CRDF Global throughout  
16 Pakistan, Egypt and Malaysia. I have consulted for the World Health Organization  
17 (WHO) and developed its Shipping of Infectious Substances Training and its  
18 Identification of Polio Samples for Eradication Efforts. In 2015, I received the John H.  
19 Richardson Special Recognition Award from the American Biological Safety  
20 Association, recognizing outstanding contributions that have enhanced ABSA and the  
21 profession of biological safety.

22 8. My publications include the following: (a) *Anthrax in New Jersey: A*  
23 *Health Education Experience in Bioterrorism Response and Preparedness*, HEALTH  
24 PROMOT. PRACT. 6:430-36 (2005); (b) *Biosafety Behavioral Based Training for High*  
25 *Biocontainment Laboratories: Bringing Theory into Practice for Biosafety Training*,  
26 APPLIED BIOSAFETY J. 12:3 (2007); (c) *Review of the Emory University Applied*  
27 *Laboratory Emergency Response Training (ALERT) Program*, APPLIED BIOSAFETY J.  
28 14:1 (2009); (c) *Surviving Biosafety: Coping with Occupational Stressors of Serving the*

1 *Profession*, APPLIED BIOSAFETY J. 17:4 (2012); (d) *Chapter 12: Strategies for*  
2 *Communicating with the General Public About High-Containment Laboratories*, ANTH.  
3 OF BIOSAFETY XIII, AM. BIOLOGICAL SAFETY ASSOCIATION (2012); (e) *Viral*  
4 *Hemorrhagic Fevers: Chapter 9 – BSL4 Workforce Preparedness in Hemorrhagic*  
5 *Fever Outbreaks*, TAYLOR & FRANCIS (2013); (f) *Bioerror and Safety Culture: The*  
6 *Leadership Commitment to the Preparedness, Protection and Promotion of Scientists*,  
7 CULTURE: A PUBLICATION OF THE AMERICAN SOCIETY FOR MICROBIOLOGY (2014); (g)  
8 *Biological Safety Principles and Practices: Chapter 28 – A One-Safe Approach.*  
9 *Continuous Safety Training Initiatives*, ASM PRESS (2017); and (h) *Prepare and*  
10 *Protect: Safer Behaviors in Laboratories and Clinical Containment Settings*, ASM &  
11 WILEY PRESS (2020).

12 9. I am an International Federation of Biosafety Professionals Certified  
13 Professional in Biorisk Management, am certified as an MBTI Certified Provider by GS  
14 Consultants, hold a Certification in Public Health provided by the National Board of  
15 Public Health Examiners and have been accredited as a Certified Health Education  
16 Specialist by the National Commission for Health Education Credentialing.

17 10. In or about November 2019, while directing a Leadership Program in  
18 Biological Risk Mitigation in Islamabad, Pakistan, I first became aware of an outbreak  
19 of what was ultimately determined to be a novel coronavirus, SARS COV-2, in Wuhan,  
20 China, that the world has since come to commonly refer to as COVID-19.

21 11. Over the ensuing months, as part of my biosafety work and regular  
22 professional development, I have engaged in a thorough review of WHO and CDC data  
23 and the reams of international and domestic scientific data that have been published  
24 regarding COVID-19 in *The Lancet*, *Dispatch*, *The New England Journal of Medicine*,  
25 *JAMA*, *Clinical Infectious Diseases* and other publications, as well as the outcomes of  
26 prevailing international and domestic and international biosafety protocols associated  
27 with COVID-19. I have also facilitated multiple trainings, discussions, and assisted  
28

1 organizations with strategies minimizing risks to health and safety specific to COVID-  
2 19.

3 12. Through that process, I have become readily familiar with COVID-19's  
4 droplet (micro and macro) and surface transmission, the risks and likelihood of  
5 symptomatic and pre-symptomatic transmission, reproduction rates, signs, symptoms,  
6 mortality, risks and other infectious disease characteristics of COVID-19 across the  
7 population – including in both children and adults, as well as those with co-morbidities.  
8 I have put that ongoing review, as well as my education and twenty-five years of public  
9 health experience, to use in implementing and evaluating COVID-19 public health and  
10 safety protocols, including with respect to public health expertise I am currently  
11 providing to, among others, large-scale venues and film and television productions on  
12 safe operating procedures and protocols.

13 13. I understand that the State of California currently claims that there is no  
14 way, consistent with science and public health, for schools located within any county  
15 that is either on or any less than 14 days removed from the State of California's  
16 COVID-19 "monitoring list" – the precise criteria for which "monitoring list" are  
17 opaque but appear to require some combination of what the state deems to be a  
18 COVID-19 "surge" in infections or hospitalizations, what the state deems to be  
19 "stretched" ICU bed or ventilator capacity, or what the state deems to be "insufficient"  
20 COVID-19 testing – to open their doors to in-person instruction of children and to do so  
21 safely. As such, I understand that the default position of the State of California is that  
22 the science of public health dictates that no school located in California counties on the  
23 "monitoring list" can open for in-person instruction at all absent, at minimum, a  
24 difficult-to-obtain waiver that most districts will not seek.

25 14. Despite the state's claim, there is no rational and legitimate scientific or  
26 public health basis supporting the sweeping breadth and scope of the State of  
27 California's above-described closure mandate. Rather, given the real and significant  
28 public health and other harms known to be associated with school closures, such



1 closures are only ever properly wielded as a disease control mechanism when the risks  
2 to children are far greater; when such closures are far more targeted – often at the  
3 individual school level; and far more limited in time. None of these criteria are met by  
4 the State of California’s school closure mandate.

5 15. With respect to risks, everything that we know as public health and  
6 infectious disease professionals about the likelihood of symptomatic and pre-  
7 symptomatic transmission, reproduction rates, signs, symptoms, mortality, risks and  
8 other infectious disease characteristics of COVID-19 in both child and adult  
9 populations both domestically and internationally does not rationally comport with what  
10 I understand the state is claiming to be true in attempting to justify its mandate. Indeed,  
11 commonly utilized Susceptible, Infectious, and Recovered – or “SIR” – disease  
12 transmission modeling associated with COVID-19, together with WHO and CDC  
13 public health metrics, suggest that California’s mandate is likely to make the overall  
14 public health situation worse and not better by, *inter alia*, enlarging the population of  
15 susceptible individuals.

16 16. With respect to targeting, the sweeping nature of the State of California’s  
17 closure mandate shows that it is not rationally targeted as an infectious disease control  
18 mechanism. There is no public health reason that a school in an unaffected portion of a  
19 California county must be prohibited from operating because of an outbreak in an  
20 affected portion of a California county. Moreover, it is simply not true for the State of  
21 California to claim that there is no way to safely operate as a school in a county that  
22 meets the state’s criteria for placement on its “monitoring list.” While nothing is ever  
23 free from any risk, the data shows that any school in any California county that (1)  
24 removes from the in-person school environment for between 5-7 days any student that  
25 (i) reports having been in contact with a person who is COVID-19 positive; or (ii) has  
26 exhibited COVID-19 symptoms; (2) engages in temperature screening of all students,  
27 staff and visitors at points of entry, denying such entry to anyone who has a fever; (3)  
28 quickly and aggressively tests, isolates and contact traces any child or staff member

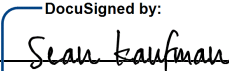
1 presenting with COVID-19 symptoms; and (4) teaches, enforces and engages in  
2 frequent handwashing, sanitization and decontamination of high travel points within the  
3 school environment, may be said to meet commonly accepted public health definitions  
4 of safe operating that minimize risks. From a public health and infectious disease  
5 control perspective, all of these features are both feasible and sustainable at minimum  
6 cost within a typical school environment.

7 17. And with respect to being limited in time, the State of California’s school  
8 closure mandate is not properly time-limited as a matter of public health and infectious  
9 disease control. To the extent the State of California may expect a vaccine at some  
10 point in the future, it should be noted that a vaccine has never been developed for a  
11 coronavirus like COVID-19. And even if developed and sufficiently adopted, any  
12 COVID-19 vaccine is likely to be similar to influenza vaccines that have been shown to  
13 quickly lose effectiveness. The latest COVID-19 data shows that the disease is not  
14 likely to ever be eradicated.

15 18. In short, the State of California’s overbroad and insufficiently targeted  
16 school closure mandate is flatly inconsistent with the science of public health, biosafety  
17 protocols and with our understanding as infectious disease professionals of the  
18 characteristics of the COVID-19 virus.

19 I declare under penalty of perjury under the laws of the United States of America  
20 that the foregoing is true and correct.

21 Executed this 26<sup>th</sup> day of July 2020, at Woodstock, Georgia.

22  
23   
24 Sean G. Kaufman  
25  
26  
27  
28





1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**  
 16 Plaintiffs,  
 17 v.  
 18 **GAVIN NEWSOM, et al.**  
 19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF CHARLES**  
 21 **CICCHETTI IN SUPPORT OF**  
 22 **MOTION FOR PRELIMINARY**  
 23 **INJUNCTION**

Judge: Hon. Dean D. Pregerson

24 Charles J. Cicchetti states under oath and on personal knowledge:

25 1. I am a resident of the State of California. I am a Managing Director at  
 26 Berkeley Research Group, Inc. I prepared my affidavit *pro bono*. The views are my  
 27 own and do not reflect the views of any entities with which I am affiliated.

28 2. I am an economist with a BA from Colorado College (1965) and a Ph.D.  
 from Rutgers University (1969), and three years of Post Graduate Research at  
 Resources for the Future (RFF). I was formally trained in statistics and econometrics



1 and accepted as an expert witness in statistics and econometrics in federal court.<sup>1</sup> In the  
2 course of my work I regularly use epidemiology models and advanced statistical  
3 techniques. I have written expert reports analyzing toxic chemical and health effects,  
4 including three reports used in settlements related to the health and cancer risks related  
5 to TCP in drinking water. I have written three monographs in support of litigation  
6 related to federal regulations based on morbidity and mortality risks from air pollution:  
7 *Why EPA's Mercury and Air Toxics Rule is Good for the Economy and America's*  
8 *Workforce*, July 2011; *Expensive Neighbors: The Hidden Cost of Harmful Pollution to*  
9 *Downwind Employers and Businesses*, January 2011; *The True Cost of Harmful*  
10 *Pollution to Downwind Families and Business*, November 2010.<sup>2</sup> In much of my work  
11 I design surveys, draw random samples and tests the data for statistically significant  
12 differences. I also have been asked to evaluate the work of other experts and to opine  
13 on the data used to draw conclusions and the significance of omitted variables and  
14 ignored facts.

15 3. I testified as an expert hundreds of times since my first testimony in 1967  
16 before regulators, arbitration panels, state and federal courts in Canada and the United  
17 States. Much of my work involves data analysis and interpretation, sampling and  
18 survey design.

19 4. I commenced my professional career after completing my academic and  
20 post-doctoral studies and eventually became a tenured Professor of Economics and  
21 Environmental Studies at the University of Wisconsin from 1972 to 1985. For the first  
22 three years I also served as the first economist for the Environmental Defense Fund

23 <sup>1</sup> For example, I analyzed the American Cancer Society's million-person health data  
24 and a Meta study of the combined health risks of smoking and asbestos exposure for a  
25 deposition in California Court in *Raybestos-Manhattan of Whiteley v. Raybestos-*  
26 *Manhattan*, Case No. 303184, November 30, 1999. More recently, I provided an expert  
27 report in *San Diego Unified Port District v. Monsanto*, No. 3:15-CV-0578 (S.D. Cal.  
28 Apr. 5, 2019).

<sup>2</sup> The last two monographs were prepared for Exelon in response to EPA's proposed  
Transport Rule under the Clean Air Act.

1 (EDF). From 1975 through 1976, I served as the Director of the Wisconsin Energy  
2 Office and as Special Energy Counselor for the Governor. In 1977, I was appointed by  
3 the Governor as Chair of the Public Service Commission of Wisconsin (“PSCW”) and  
4 held that position until 1979 and served as a Commissioner until 1980.

5 5. I am a consultant and expert witness. During much of my career I taught  
6 economics and public policy. From 1987 until 1990, I served as Deputy Director of the  
7 Energy and Environmental Policy Center at the John F. Kennedy School of  
8 Government at Harvard University. After teaching part time, in 1998, I accepted the  
9 Jeffrey J. Miller Chair in Government, Business and the Economy at the University of  
10 Southern California, which I held until 2006. I returned to a part time role at USC,  
11 where I currently meet with students who study lectures that I pre-recorded. I served on  
12 the California Governor’s Market Advisory Group responding to the California Energy  
13 Crisis in 2000. I joined Berkeley Research Group as Managing Director in 2016. A  
14 true and correct copy of my *c.v.* is attached as Exhibit 6.

15 6. I reviewed the Complaint the Dhillon Law Group filed for Declaratory and  
16 Injunctive Relief on behalf Mathew Brach and other Plaintiffs against Gavin Newsome  
17 and others to challenge California adopting a new wave of COVID-19 restrictions  
18 “barring in-person schooling for most children in California.”

19 7. The purpose of my Affidavit is to explain California’s guidelines that will  
20 cause California’s public and private schools to remain shuttered this fall and harm  
21 millions of children and their parents. I show that California’s exclusive reliance on the  
22 number of COVID-19 “cases” to quantify health risks is too narrow a focus. Very  
23 importantly the number of cases tracks the level of testing, which has been ramped-up.  
24 This quantum omits other measures of morbidity and mortality that are better indicators  
25 of health risks and provide much more accurate measures of changes in health risks  
26 over time.

27 8. School closings ignore the stubborn fact that school-age children are not  
28 very susceptible to COVID-19 health risks. Teachers and staff are younger than the

1 more at risk seniors. The CDC and California health officials have designed steps that  
2 school children should follow, distancing protocols, sanitation and other things to  
3 protect children, teachers and staff. Hard data, experience from other nations and  
4 sensible steps greatly reduce the health risk of schools reopening in California. There  
5 also would be the added benefits of providing a safe and secure place for kids and  
6 avoiding critical damages from interrupting and losing what could easily be 10% of a  
7 child's elementary and secondary education.

8 9. This action California has taken seems predicated partially on a belief that  
9 California is experiencing a worsening in COVID-19 related health conditions. The  
10 primary data used to support the conclusion that things are worse in California is the  
11 dramatic rise in positive cases reported daily. No death or serious illness should be  
12 ignored. California has its share of both. That said, trade-offs are mostly necessary to  
13 achieve the Public Interest reflecting a sober balance of benefits and costs. Very  
14 importantly, other data related to testing and health must be considered. I teach my  
15 students and testify routinely explaining that "omitting variables" biases conclusions.  
16 Facts ignored result in flawed public policy.

17 10. In practical terms concentrating on a single measure of health risk to  
18 determine the best response omits a great deal, which leads to biased conclusions and  
19 can result in faulty policy choices. California relies heavily, if not exclusively on  
20 COVID-19 case counts (cases), to determine if various counties should slow down,  
21 accelerate or reverse opening businesses, gathering places and more. More specifically,  
22 the California Department of Public Health (CDPH) issued "Guidance on Closure of  
23 Sectors in Response to COVID-19" on July 1, 2020. The state monitors counties to  
24 determine what can open, remain shuttered, and closed after reopening.

25 11. The current Guidance continues the May 7, 2020 Order of the State Public  
26 Health Officer that relies on confirmed cases requiring "stable rates of infections",  
27 based on new infections, hospitalizations, surge capacity, improved ability to test,  
28 contract trace, isolate and provide support to individuals exposed. Two refer to medical

1 matters directly. “Cases” mean people who test positive for a COVID-19 infection.  
2 “Hospitalizations” refers to available capacity including standard non-Covid-19  
3 patients, current Covid-19 patients in hospital care and potential surges in patients  
4 needing hospital care. The description of hospitalizations anticipates that some  
5 treatments and surgeries can be postponed. This makes the potential supply of beds,  
6 ICU and ventilator resources somewhat elastic because it is reasonable to free-up  
7 resources if an “acute care surge” in COVID-19 patients were to hit California’s  
8 hospitals. (I explain below that California counties mostly satisfy the standards based  
9 on maintaining hospital capacity.)

10 12. The CDPH formulates its “opening” or the more pessimistic “shuttering”  
11 criteria for counties and sub-political units with a variance form, “Covid-19 County  
12 Variance Attestation Form”. This provides a roadmap that allows political sub-divisions  
13 to seek to alter the state’s rules on what can open in either direction.

14 13. The CDPH publishes its data that monitors its “opening” criteria daily. As  
15 of July 23, 2020. Only 6 of 58 counties exceeded the 3-day criteria for increased  
16 hospitalizations for COVID-19 and other patients by more than 10%. Two of the six  
17 were 10.5% or less. None of the counties had less than the 25% of stand-by ventilator  
18 capacity criteria. Only 12 of the 58 counties missed the stand-by ICU bed availability  
19 criteria of 20%. Based on hospital resource availability criteria, virtually all schools in  
20 California could re-open this fall.

21 14. The number of new cases being reported is the criteria that drives school  
22 closings in California. Most counties are performing the required number of tests. Four  
23 counties had fewer than the CDPH criteria of 150 tests performed per 100,000 people  
24 based on a 7-day average with a 7-day lag. Nevertheless, three<sup>3</sup> passed at least one of  
25 the “Case Rate” criteria based on less than 100 per 100,000 over 14 days, or less than a  
26 25 case rate and positivity less than 8%. The other 54 counties exceeded the number of

27 \_\_\_\_\_  
28 <sup>3</sup> Glenn county with a population of about 28,000 did not satisfy the state’s number of  
testing and case level criteria.

1 tests per day criteria, but could not satisfy the case level criteria for re-opening. There  
2 were 23 counties with case rates that exceeded both the CDPH threshold elevated case  
3 rate criteria. There were another 14 counties that did not CDPH's case rate per 100,000  
4 (14 day) criteria. These 37 counties could not seek a variance. Others would need to  
5 file a variance to re-open.

6 15. It is logical to expect that the number of tests performed and cases reported  
7 would be highly correlated. Put simply more testing will yield more positive cases  
8 being reported. The only exceptions would reflect differences in demographic and  
9 medical conditions in the additional people being tested. In the early days of covid-19  
10 most testing was done at hospitals where people who were very sick were omitted and  
11 for first responders and medical-care providers. The former were almost certainly  
12 infected. The first responders were often healthy and relatively younger than the senior  
13 citizens who were very prone to being infected and becoming sick.

14 16. By mid-April testing was ramping up. Prior testing samples were not  
15 random. The initial expanded testing involved self-selecting and this skewed early  
16 results, but the initial bias was reduced. By mid-May there were 10 million tests  
17 performed and a month later in mid-June the total number of tests doubled. In July total  
18 testing nationwide approaches 50 million. Testing remains mostly self-selection.  
19 Nevertheless, with the number of tests approximating 15% of the population the "law of  
20 large numbers" results in the sample mean moving closer to the average of the whole  
21 population. For this reason, with more testing the underlying statistics related to  
22 infection rates and deaths become more stable. Nationally, the 7-day average infection  
23 rate per test using the Johns Hopkins University (JHU) data is 8.5%. The current  
24 national death rate across all demographic groups is about 43 people per 100,000. The  
25 deaths per infected case nationwide average 3.7%.

26 17. California is a state with about 40 million people. The number tested is  
27 about 6.7 million, or nearly 17%. California has a lower corresponding infection rate of  
28 about 7.6% than the national average. Current deaths for all demographic groups are



1 19.9 people per 100,000 or less than half the national rate. In California the deaths per  
2 infected case averages less than 2.0%.

3 18. The JHU and CDC data show that between mid-May through today that as  
4 testing was ramped up cases reported and thus infections 100,000 increased  
5 proportionally. The CDPH criteria for seeking a variance to open businesses and  
6 schools is based on the cases reported at a county level. With high and growing levels  
7 of testing this effectively means shuttering schools and businesses.

8 19. Other states have not implemented what is in effect a statewide ban on  
9 school re-opening. This is despite the fact that California has not suffered as much as  
10 the rest of the nation and other large states. See the following table<sup>4</sup>. Further, since  
11 early July confirmed new cases and deaths have stabilized in California based on  
12 moving average data.

13  
14 **Politico Summary top five states (July 22, 2020)**

	<b>Deaths</b>	<b>Pos Cases</b>	<b>Tests</b>	<b>Population</b>
15 NY (all)	25,506	407,326	5,164,812	19 million
16 CA	7,694	391,538	6,414,321	40 million
17 FL	5,183	360,394	3,052,106	21 million
18 TX	4,020	332,434	2,984,554	29 million
19 NJ	15,715	176,963	1,802,874	8.9 million

20  
21 California has less mortality and morbidity relative to its population size compared to  
22 national data and the other large states shown except for Texas with respect to deaths  
23 relative to population. California's infection rate of positive cases divided by the  
24 number of tests using the Politico data is 6.1%. Nationwide there are about 4.17 million  
25 positive cases with about 4.86 million cases for an infection rate nationally of 8.6%.  
26 California has less than half the national mortality rate and lower infection rates.

27  
28 <sup>4</sup> Politico data is used because CDC data separate New York and New York City.

1           20. Other than case growth consistent which is directly tied to the number of  
2 tests, there is no evidence that California should continue to shutter schools. There is  
3 insufficient evidence or facts to justify the exceptional decision to close virtually every  
4 school in the state. The use of the number of cases to drive this policy obfuscates  
5 matters and yields a flawed statistic and a costly policy choice all things considered.

6           21. California effectively bans all schools from reopening because it adopted a  
7 nearly impossible to achieve “variance” application process. Virtually every county  
8 could pass the hospitalization and critical medical resource availability criteria the  
9 CDPH adopted for reopening. However, a relatively constant infection rate, regardless  
10 of having lower infection rates than other states, means that maintaining daily testing  
11 levels will yield more cases. Expanding testing as planned in some counties will  
12 actually further increase the number of reported cases. Headlines will proclaim a  
13 growing health threat and mostly ignore the stubborn fact that the more people tested  
14 the more cases will be detected. Worse, the CDPH criteria will make it impossible with  
15 expanded testing for variances to be granted.

16           22. Medical treatments are reportedly showing improvements in recovery and  
17 reducing the time COVID-19 patients need to be hospitalized and given extensive  
18 treatment. This is good news and deaths in California are also stabilizing since early  
19 July. Such successes are mostly good news. Nevertheless, they mask some important  
20 data that should affect the reasonableness of shuttering schools this fall.

21           23. The CDPH reported on July 21, 2020 (shown below) there were no deaths  
22 for children under 17 in California related to COVID-19. The following table shows the  
23 race and ethnic breakdown when the information was reported. The actual number of  
24 cases in this category is 37,335 with 34% not reporting race/ethnicity.



1                   **Proportions of Cases and Deaths by Race and Ethnicity Among Ages 0- 17**

2

3

4

5

Race/Ethnicity	No. Cases	Percent Cases	No. Deaths	Percent Deaths	Percent CA Population
6 Multi-Race	173	0.7	0	0.0	4.0
7 Latino	16,481	67.3	0	0.0	47.9
8 White	2,231	9.1	0	0.0	29.2
9 Asian	561	2.3	0	0.0	12.7
10 African American	567	2.3	0	0.0	5.4
11 American Indian	36	0.1	0	0.0	0.4
12 Native Hawaiian and other Pacific Islander	70	0.3	0	0.0	0.3
13 Other	4,364	17.8	0	0.0	0.0
14 Total	24,483	100.0	0	0.0	100.0

15

16

17

18

19

20

21                   This comparison shows that Latino children have 2/3 of the reported COVID-19

22 cases and are less than half the sample. For the children that report race/ethnicity,

23 Latino children appear to be at much greater risk of infection. There are no deaths for

24 any children across California. Non-white children represent more than 70% of the

25 infected cases. The different race/ethnicity effects are made worse to the extent there is

26 a similar correlation with respect to access to educational resources during school

27 closings.

28

1           24. Older California residents are more likely to be infected and some will die.  
2 The health risks increase with age. The CDPH have compiled the following data with  
3 somewhat higher case levels than JHU and CDC. The following table shows the age  
4 breakdown of cases and deaths in the CDPH data.

5                           **CDPH Infection and Death**

6                           **July 21**

7

8           Age	Cases	Percent %	Deaths	Percent %
9           0-17	37335	8.8	0	0
10          18-34	149968	35.3	97	1.2
11          35-49	106885	25.1	429	5.4
12          50-64	82217	19.3	1371	17.3
13          65-79	33529	7.9	2565	32.3
14          80 plus	15215	3.6	3487	43.9
15				
16 <b>Total</b>	425149	100	7949	100

17

18           More than 76% of deaths in California were people 65 and older, but just about  
19 11.5% of the infections. This shows based on age alone that most teachers and staff in  
20 schools, who are likely less than 65 have much lower mortality risk. If adults in schools  
21 who have pre-existing conditions are protected as the CDPH Guidelines specify, this  
22 further reduces teacher and staffing risk.

23           25. I conclude that school age children are not at risk form serious COVID-19  
24 and the minimal general risk can be further reduced using the Guidelines of the CDPH  
25 and CDC related to hand washing, masks, social distancing, additional sanitation and  
26 more. Coupled with widely discussed additional risks related to reduced nutrition, abuse  
27 and losing learning, the net benefits for children attending in-person schools are  
28 overwhelming. I have been teaching for fifty years. In my experience elementary and

1 secondary preparation can level the ability to perform. Most children lost last semester  
2 in class studies. Adding another year would be a loss of more than 10 percent of a  
3 child’s time learning in elementary and secondary schools. After returning there would  
4 be time spent to enable children to catch-up. Without extending the number of school-  
5 days the loss would be difficult to overcome. Later at university and during work years,  
6 these lost months of learning will put most kids behind others who did not miss similar  
7 time in classroom learning.

8 26. I also conclude that teachers and other staff risks can be controlled with  
9 improvements in testing, tracking, better therapeutic care, identifying at risk people and  
10 isolating them. Accordingly, it seems certain that the risks this fall for teachers and  
11 staff are much less than last spring when schools shuttered in California. Further, there  
12 is increasing evidence from other nations that children do not have high transmission  
13 rates for COVID-19.

14 27. I have been teaching undergraduate college students for many decades.  
15 Many of my generation are living proof that education lifts students and opens many  
16 pathways for success. In my experience over a number of decades teaching  
17 undergraduates, I find that race and ethnicity do not matter in terms of academic  
18 performance. However, I am concerned that a new gap will open without in-classroom  
19 teaching, if internet access and other teaching resources are not equal across  
20 race/ethnicity. This would reverse the many recent decades of success for many  
21 California children.

22 I declare under the penalty of perjury under the laws of the United States of  
23 America and the State of California that the foregoing is true and correct.

24  
25  
26 Dated: July 25, 2020

DocuSigned by:  
*Charles J. Cicchetti*  
F358633A818F49B...  
Charles J. Cicchetti



**EXHIBIT 6**

## Curriculum Vitae



**Charles J. Cicchetti**  
BERKELEY RESEARCH GROUP, LLC  
Emeryville | California | 94608

Direct: 626.577.9551  
[ccicchetti@thinkbrg.com](mailto:ccicchetti@thinkbrg.com)  
[ccicchetti@mac.com](mailto:ccicchetti@mac.com)

### SUMMARY

Charles J. Cicchetti, Ph.D. is a Managing Director at Berkeley Research Group. Dr. Cicchetti is an economist and former Chair of the Wisconsin Public Service Commission (PSCW). He was a tenured Full Professor of Economics and Environmental Studies at the University of Wisconsin, Madison, Deputy Director of the Energy and Environmental Policy Center at the John F. Kennedy School at Harvard University, and The Miller Chair of Government, Business and the Economy at The University of Southern California (USC). He currently lectures graduate students in the Electricity Engineering Department at the University of Southern California.

He testified extensively and written a number of books and articles on electricity economics. He co-authored *Perspective on Power* and the *Marginal Cost and Pricing of Electricity*, which is widely referenced worldwide. He also authored *Restructuring Electricity Markets*, discusses market economic principles developed for the World Bank, and *The California Electricity Crisis*, that expanded his discussion of electricity market liberalization and things to avoid. His most recent books are *Going Green and Getting Regulation Right* (2009), and *Climate Change and Regulation* (2019).

Dr. Cicchetti has served as an expert advisor in complex litigation and arbitration related to wholesale markets in Canada and the United States. He was the sole author of an *Amicus Curiae Brief for the US Supreme Court* on expanding wholesale markets to include demand-side management. Much of his work throughout his career includes valuing benefits and costs and estimating damages related to environmental preservation and injury and preservation.

### EDUCATION

Ph.D., Economics	Rutgers University, 1969
B.A.	Colorado College, 1965
	US Air Force Academy, 1961 to 1964

### PRESENT EMPLOYMENT

Managing Director and Member, Berkeley Research Group (BRG) 2017

Adjunct Instructor, Department of Electrical Engineering, USC Viterbi School of Engineering 2016 to present



## **PREVIOUS ACADEMIC POSITIONS**

2009- Present	Instructor in Electric Engineering, University of Southern California
1991-2008	Adjunct Professor, University of Southern California
1998-2006	Jeffrey J. Miller Professor in Government, Business, and the Economy, University of Southern California
1987-1990	Deputy Director, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University
1979-1986	Tenured Professor of Economics and Environmental Studies, University of Wisconsin-Madison
1974-1979	Associate Professor, Economics and Environmental Studies, University of Wisconsin-Madison
1972-1974	Visiting Associate Professor, Economics and Environmental Studies, University of Wisconsin-Madison
1972	Associate Lecturer, School of Natural Resources of the University of Michigan
1969-1972	Post-Doctoral Research Resources for the Future, Washington, D.C.
1968-1969	Instructor, Rutgers University

## **PROFESSIONAL AWARDS, RECOGNITION, AND PRIZES**

1965 Leo Mohl Award for Best Senior Thesis in Economics, Colorado College  
1965 Kaye Prize for Outstanding Student in Economics, Colorado College

## **EXTERNAL GRANTS**

1966 to 1969 US Department of the Interior (DOI), Bureau of Outdoor Recreation, financed PhD Thesis.  
1972 to 1975 Environmental Defense Fund (EDF)  
1972 to 1975 National Science Foundation and Upper Great Lakes Regional Commission  
1973 to 1974 Ford Foundation Energy Policy Project and Public Interest Economic Foundation  
1975 to 1977 National Science Foundation and Planning and Conservation Foundation

## **PROFESSIONAL AFFILIATIONS**

### **PRIOR EDITORIAL BOARDS**



*Journal of Environmental Economics and Management*, Former Member;

*Energy Systems and Policy*, Former Member

*Land Economics*, Former Editor

## **BUSINESS AND NOT-FOR-PROFIT AFFILIATIONS**

2013-Present	Co-Founder and Board Member, Sally's Rescue Inc., dog rescue 501 3(c) Foundation
1996-2016	Co-Founder, Pacific Economics Group, a California LLC
2008-2016	Senior Advisor to Navigant Consulting, Inc.
1992-1996	Managing Director, Arthur Andersen Economic Consulting
1991-1992	Co-Chairman, Putnam, Hayes & Bartlett, Inc.
1988-1991	Managing Director, Putnam, Hayes & Bartlett, Inc.
1984-1987	Senior Vice President, National Economic Research Associates
1980-1984	Co-Founder and Partner, Madison Consulting Group
1977-1979	Chairman, Public Service Commission of Wisconsin, Appointed by Governor Patrick J. Lucey (member until 1980)
1975-1976	Director, Wisconsin Energy Office and Special Energy Counselor for Governor Patrick J. Lucey, State of Wisconsin

## **PUBLICATIONS**

### **BOOKS AND MONOGRAPHS**

*Climate Change and Regulation: Going Green II*. Vienna, Virginia: Public Utilities Report, Inc. 2019.

*Amicus Curiae* Brief of Charles J. Cicchetti (sole author) before the Supreme Court of the United States related to including Demand Side Bidding in wholesale electricity markets on behalf of Petitioners in *Federal Energy Regulatory Commission v. Elec. Power Supply Association*, 135 S. Ct. 2049 (2015).

*Why EPA's Mercury and Air Toxics Rule is Good for the Economy and America's Workforce*, July 2011.

*The Results in Context: A Peer Review of EEI's "Potential Impacts of Environmental Regulation in the U.S. Generation Fleet,"* with Susan Tierney, PhD, May 11, 2011.

*Expensive Neighbors: The Hidden Cost of Harmful Pollution to Downwind Employers and Businesses*, prepared for Exelon in response to EPA's proposed Transport Rule under the Clean Air Act, January 2011.

*The True Cost of Harmful Pollution to Downwind Families and Business*, prepared for Exelon in response to EPA's proposed Transport Rule under the Clean Air Act, November 2010.



- Economic Regulation and the Development of Integrated Energy Systems*, with Mike Cleland & Sean Conway, *ICES Literary Series*, Vol. 1, September 2012.
- Going Green and Getting Regulation Right: A Primer for Energy Efficiency*. Vienna, Virginia: Public Utilities Report, Inc. 2009.
- Natural Gas: The Other California Energy Crisis*, Pacific Economics Group Working Paper, with Colin M. Long, February 2007.
- The California Electricity Crisis: What, Why, and What's Next*, with Jeffrey A. Dubin & Colin M. Long, 2004.
- A Tarnished Golden State: Why California Needs a Public/Private Partnership for its Electric Supply System*, with Colin M. Long, August 2003.
- Restructuring Electricity Markets: A World Perspective Post-California and Enron*, with Colin M. Long & Kristina M. Sepetys, 2003.
- Energy Deregulation: The Benefits of Competition Were Undermined by Structural Flaws in the Market, Unsuccessful Oversight, and Uncontrollable Competitive Forces*, 2001.
- Restructuring Electricity Markets: A World Perspective*, with Kristina M. Sepetys, 1996.
- The Economic Consequence of Independent Film Making*, with W.B. Peale, Stefan Boedeker, Jeffrey Dubin & Jeff Truitt, 1995.
- The Application of U.S. Regulatory Techniques to Spain's Electric Power Industry, Energy and Environmental Policy Center, Harvard University*, with Irwin M. Stelzer, March 1988.
- The Economic Theory of Enhanced Natural Gas Service to the Industrial Sector: An Applied Approach*, Vol. II, with L.D. Kirsch, 1982 (prepared for the Gas Research Institute, Contract No. 5080-380-0349)
- The Economic Theory of Enhanced Natural Gas Service to the Industrial Sector: An Applied Approach*, Vol. I, with L.D. Kirsch, 1981 (prepared for the Gas Research Institute, Contract No. 5080-380-0349).
- The Economic Effects of Deregulating Natural Gas*, with R.H. Haveman, M. Lowry, M. Post & R. Schmidt, for the Northeast Coalition for Energy Equity, 1981.
- The Marginal Cost and Pricing of Electricity: An Applied Approach*, with W. Gillen & P. Smolensky, Cambridge: Ballinger Publishing Company, 1977.
- The Costs of Congestion: An Econometric Analysis of Wilderness Recreation*, with V.K. Smith, Cambridge: Ballinger Publishing Company, 1976.
- Energy System Forecasting, Planning and Pricing*, ed. with W. Foell for the National Science Foundation, Madison: University of Wisconsin Monograph, 1975.
- Studies in Electric Utility Regulation*, ed. with J. Jurewitz for the Ford Foundation Energy Policy Project, Cambridge: Ballinger Publishing Company, 1975.
- Perspective on Power: A Study of the Regulation and Pricing of Electric Power*, with E. Berlin & W. Gillen for the Ford Foundation Energy Policy Project, Cambridge: Ballinger Publishing Company, 1974.





*A Primer for Environmental Preservation: The Economics of Wild Rivers and Other Natural Wonders*, New York: MSS Modular Publication, 1973.

*Forecasting Recreation in the United States: An Economic Review of Methods and Applications to Plan for the Required Environmental Resources*, Lexington: Lexington Books, June 1973.

*Alaskan Oil: Alternative Routes and Markets*, for Resources for the Future, Baltimore: Johns Hopkins University Press, December 1972.

*The Demand and Supply of Outdoor Recreation: An Econometric Analysis*, Ph.D. Thesis: Rutgers University, 1969. Also, with J.J. Seneca & P. Davidson, Washington, D.C.: U.S. Department of Interior, Bureau of Outdoor Recreation, Contract No. 7-14-07-4, 1969.

*The Impact of Mine Drainage on Recreation* (Appendix E, Appalachian Regional Commission, 1969). Consultant to Robert R. Nathan Associates, State of New York: an analysis recreation participation to develop the recreational attributes of Finger Lakes (1969). (Assisted John Carson of RRNA.)

*Visitor Industry and Hawaii's Economy: A Benefit Cost Analysis*, MATHEMATICA, Inc., Princeton, NJ 1969. Consultant to Mathematica Inc. (Princeton, NJ) assisted William Baumol to estimate an econometric model for the visitor industry in Hawaii to design state tax and tourist policy.

*The Demand for Water Oriented Recreation*, assisted Paul Davidson and Joseph Seneca of the Wharton School of Finance, RFF Mimeo, 1967.

*A Neo Keynesian Equilibrium Analysis For an Open Economy*, A.B. Thesis, Colorado College, Colorado, Springs, Colorado, May 1965.

## ARTICLES

“Why Regulators Should Replace Electric Utility Rate Base: Challenging Choices,” *Public Utilities Fortnightly*, May 2018.

“Why Are We Still Arguing About NEM: Competitive Markets Will Take Care of Next Burning Issue,” *Public Utilities Fortnightly*, March 2017.

“Residential Demand Charges: A Bad Choice,” *Public Utilities Fortnightly*, December 2016.

“Response to Brown Re: Net Metering,” *Public Utilities Fortnightly*, April 2016.

“Order 745: Challenges Plain Old Electricity Markets,” *Public Utilities Fortnightly*, April 2016.

“The Policy Aspects of Benefit-Cost Analyses for Distributed Solar Generation and Net Metering,” *Electricity Policy, Electricity Daily*, January 2016.



- “Solar Battle Lines,” with Jon B. Wellinghof, *Public Utilities Fortnightly*, December 2015.
- “Inflated Numbers; Erroneous Conclusions: The Navigant Wind Jobs Report,” American Energy Alliance, The National Center for Public Policy Research, March 2013.
- “Technology for the Masses: The Consumer-Centric Smart Grid and Its Challenge for Regulators,” with Philip Mause, *Public Utilities Fortnightly*, October 2011.
- “Duke’s Fifth Fuel,” *Public Utilities Fortnightly*, January 2008.
- “Public Service Commission of Wisconsin, 1977-1980,” *The NRRI Journal of Applied Regulation*, Vol. 4, December 2006.
- “A Brief History of Rate Base: Necessary Foundation of Regulatory Misfit,” with Colin M. Long, *Public Utilities Fortnightly*, July 2006.
- “ISOs and Transcos: What’s at Stake?” with Gary D. Bachman & Colin M. Long, *The Electricity Journal*, December 2000.
- “Politics as Usual: A Roadmap to Backlash, Backtracking and Re-regulation,” with Colin M. Long, *Public Utilities Fortnightly*, October 2000.
- “Transmission Products and Pricing: Hidden Agendas in the ISO/Transco Debate,” with Colin M. Long, *Public Utilities Fortnightly*, June 1999.
- “Mergers and the Convergence of the Electric and Natural Gas Industries,” *Natural Gas*, March 1997.
- “Been There, Done That: Sunk Costs, Access Charges and the Transmission Pricing Debate,” *Energy*, Vol. XXI, No. 4, September 1996.
- “Regulating Competition: Transition or Travesty?” with Kristina M. Sepetys, *The Electricity Journal*, May 1996.
- “California Model Sets the Standard for Other States,” with Kristina M. Sepetys, *World Power Yearbook*, 1996.
- “Measuring the Effects of Natural Resource Damage and Environmental Stigma on Property Value,” *Environmental Law*, September/October 1995.
- “The Route Not Taken: The Decision to Build the Trans-Alaska Pipeline and the Aftermath,” *The American Enterprise*, Vol. 4, No. 5, September/October 1993.
- “A Micro-Econometric Analysis of Risk-Aversion and the Decision to Self-Insure,” with Jeffrey Dubin, *Journal of Political Economy*, Revised, July 1993. (Vol. 102, No. 1, February 1994.)
- “Energy Utilities, Conservation, Efficiency,” with Vinayak Bhattacharjee & William Rankin, *Contemporary Policy Issues*, Vol. XI, No. 1, January 1993.
- “Uniqueness, Irreversibility, and the Theory of Nonuse Values,” with Louis L. Wilde, *American Agricultural Economics Association*, December 1992.



- “Utility Energy Services,” with Ellen K. Moran, *Regulatory Incentives for Demand-Side Management*, Ch. 9, American Council for an Energy-Efficient Economy, December 1992.
- “A Micro-Econometric Analysis of Risk Aversion and the Decision to Self-Insure,” with Jeffrey A. Dubin, *California Institute of Technology*, January 1992.
- “The Use and Misuse of Surveys in Economic Analysis: Natural Resource Damage Assessment Under CERCLA,” with Jeffrey Dubin & Louis Wilde, *California Institute of Technology*, July 1991.
- “The Federal Energy Regulatory Commission’s Proposed Policy Statement on Gas Inventory Charges (PL-89-1-1000),” *Energy and Environmental Policy Center*, Harvard University, Discussion Paper E-89-11, July 1989.
- “Incentive Regulation: Some Conceptual and Policy Thoughts,” *Energy and Environmental Policy Center*, Harvard University, Discussion Paper E-89-09, June 1989.
- “Including Unbundled Demand-Side Options in Electricity Utility Bidding Programs,” with William Hogan, *Public Utilities Fortnightly*, June 1989. (Also a Discussion Paper E-88-07).
- “Assessing Natural Resource Damages Under Superfund: The Case Against the Use of Contingent Value Survey Methods,” with Neil Peck, *Natural Resources & Environment*, Vol. 4, No. 1, Spring 1989.
- “Pareto Optimality Through Non-Collusive Bilateral Monopoly with Cost-of-Service Regulation (or: Economic Efficiency in Strange Places),” with Jeff D. Makhholm, *Energy and Environmental Policy Center*, Harvard University, Working Paper, 1988.
- “The FERC’s Discounted Cash Flow: A Compromise in the Wrong Direction,” with Jeff Makhholm, *Public Utilities Fortnightly*, July 9, 1987.
- “Conservation Subsidies: The Economist’s Perspective,” with Suellen Curkendall, *Electric Potential*, Vol. 2, No. 3, May/June 1986.
- “Our Nation’s Gas and Electric Utilities: Time to Decide,” with R. Shaughnessy, *Public Utilities Fortnightly*, December 3, 1981.
- “Is There a Free Lunch in the Northwest? (Utility-Sponsored Energy Conservation Programs),” with R. Shaughnessy, *Public Utilities Fortnightly*, December 1980.
- “Opportunities for Canadian Energy Policy,” with M. Reinbergs, *Journal of Business Administration*, Vol. 10, Fall 1978/Spring 1979.
- “Energy Regulation: When Federal and State Regulatory Commissions Meet,” with J. Williams, *American University Law Review*, 1978.
- “The End-User Pricing of Natural Gas,” with Don Wiener, *Public Utilities Fortnightly*, March 1978.
- “An Econometric Evaluation of a Generalized Consumer Surplus Measure: The Mineral King Controversy,” with V.K. Smith & A.C. Fisher, *Econometrica*, Vol. 44, No. 6, 1976.



- “Alternative Price Measures and the Residential Demand for Electricity: A Specification Analysis,” with V.K. Smith, *Regional Science and Urban Economics*, 1975.
- “An Economic Analysis of Water Resource Investments and Regional Economic Growth,” with V.K. Smith & J. Carston, *Water Resources Research*, Vol. 12, No. 1, 1975.
- “A Note on Fitting Log Linear Regressions with Some Zero Observations for the Regressand,” with V.K. Smith, *Metroeconomica*, Vol. 26, 1975.
- “The Design of Electricity Tariffs,” *Public Utilities Fortnightly*, August 28, 1975.
- “The Economics of Environmental Preservations: Further Discussion,” with A.C. Fisher & J.V. Krutilla, *American Economic Review*, Vol. 64, No. 6, December 1974.
- “Electricity Price Regulation: Critical Crossroads or New Group Participation Sport,” *Public Utilities Fortnightly*, August 29, 1974.
- “Interdependent Consumer Decisions: A Production Function Approach,” with V.K. Smith, *Australian Economic Papers*, December 1973.
- “Economic Models and Planning Outdoor Recreation,” with A.C. Fisher & V.K. Smith, *Operations Research*, Vol. 21, No. 5, September/October 1973.
- “Evaluating Federal Water Projects: A Critique of Proposed Standards,” with R.K. Davis, S.H. Hanke, & R.H. Haveman, *Science*, Vol. 181, August 1973.
- “The Mandatory Oil Import Quota Program: A Consideration of Economic Efficiency and Equity,” with W. Gillen, *Natural Resources Journal*, Vol. 13, No. 3, July 1973.
- “Congestion, Quality Deterioration and Optimal Use: Wilderness Recreation in the Spanish Peaks Primitive Area,” with V.K. Smith, *Social Sciences Research*, Vol. 2, March 1973 (reprinted July 1973).
- “The Economics of Environmental Preservation: A Theoretical and Empirical Analysis,” with A.C. Fisher & J.V. Krutilla, *American Economic Review*, Vol. 62, No. 4, September 1972.
- “Recreation Benefit Estimation and Forecasting: Implications of the Identification Problem,” with V.K. Smith, J.L. Knetsch, & R. Patton, *Water Resources Research*, Vol. 8, No. 4, August 1972.
- “Evaluating Benefits of Environmental Resources with Special Application to the Hells Canyon,” with J.V. Krutilla, *Natural Resources Journal*, Vol. 12, No. 1, January 1972. (Also published in *Benefit-Cost and Policy Analysis*, 1972.)
- “On the Economics of Mass Demonstrations: A Case Study of the November 1969 March on Washington,” with A.M. Freeman, R.H. Haveman, & J.L. Knetsch, *American Economic Review*, Vol. 61, No. 4, September 1971.
- “Option Demand and Consumer Surplus: Further Comment,” with A.M. Freeman III, *Quarterly Journal of Economics*, Vol. 85, August 1971.
- “Some Economic Issues Involved in Planning Urban Recreation Facilities,” *Land Economics*, February 1971.



“A Note on Jointly Supplied Mixed Goods,” with V.K. Smith, *Quarterly Review of Economics and Business*, Vol. 10, No. 3, Autumn 1970.

“A Gravity Model Analysis of the Demand for Public Communication,” with J.J. Seneca, *Journal of Regional Science*, Vol. 9, No. 3, Winter 1969.

## Articles Appearing in Other Volumes

“Including Unbundled Demand-Side Options in Electric Utility Bidding Programs,” in *Competition in Electricity: New Markets & New Structures*, with William Hogan and edited by James L. Plummer & Susan Troppmann, Public Utilities Reports and QED Research Inc.: Arlington, Virginia, March 1990.

“Meeting the Nation’s Future Electricity Needs: Cogeneration, Competition and Conservation,” in *1989 Electricity Yearbook*, New York: Executive Enterprises, 1989.

“Environmental Litigation and Economic Efficiency: Two Case Studies,” with R. Haveman in *Environmental Resources and Applied Welfare Economics: Essays in Honor of John F. Krutilla*, V.K. Smith ed., Washington, DC: Resources for the Future, 1988.

“Electricity and Natural Gas Rate Issues,” with M. Reinbergs, in *The Annual Energy Review*, Palo Alto: Annual Reviews Inc., Vol. 4, 1979.

“Die Erhaltund der Naturlichen Umwelt: Eine Theoretische und Empirische Untersuchung” with A. Fisher & John Krutilla, *Sonderdruck aus Umivelt und Wirtschaftliche Entwicklung*, Sieten 249-279, 1979.

“The Measurement of Individual Congestion Costs: An Econometric Application to Wilderness Recreation,” with V.K. Smith, in *Theory and Measurement of Economic Externalities*, ed. S.A. Lin, New York: Academic Press, 1976.

“Implementing Diurnal Electricity Pricing in the U.S.: A Pragmatic Approach,” in *Energy System Forecasting, Planning and Pricing*, ed. C.J. Cicchetti & W. Foell, Madison: University of Wisconsin Press, February 1975.

“Measuring the Price Elasticity of Demand for Electricity: The U.S. Experience,” with V.K. Smith, in *Energy System Forecasting, Planning and Pricing*, ed. C.J. Cicchetti & W. Foell, Madison: University of Wisconsin Press, 1975.

“Public Utility Pricing: A Synthesis of Marginal Cost, Regulatory Constraints, Averch-Johnson Bias, Peak Load and Block Pricing,” with J. Jurewitz, in *Studies in Electric Utility Regulation*, ed. C.J. Cicchetti & J. Jurewitz, Cambridge: Ballinger Publishing Company, 1975.

“Congestion, Optimal Use and Benefit Estimation: A Case Study of Wilderness Recreation,” with V.K. Smith, in *Social Experiments and Social Program Evaluation*, ed. J.G. Albert & M. Kamrass, Cambridge: Ballinger Publishing Company, 1974.

“Electricity Growth: Economic Incentives and Environmental Quality,” with W. Gillen, in *Energy: Demand, Conservation and Institutional Problems*, ed. M. Macrakis, Cambridge: MIT Press, 1974.



- “Some Institutional and Conceptual Thoughts on the Measurement of Indirect and Intangible Benefits and Costs,” with John Bishop, in *Cost-Benefit Analysis and Water Pollution Policy*, ed. H. Peskin & E. Seskin, Washington, D.C.: Urban Institute, 1974.
- “The Trans-Alaska Pipeline: An Economic Analysis of Alternatives,” with A.M. Freeman III, in *Pollution, Resources and the Environment*, ed. A.C. Enthoven & A.M. Freeman III, New York: W.W. Norton and Co., 1973.
- “Alternative Uses of Natural Environments: The Economics of Environmental Modification,” with A.C. Fisher and J.V. Krutilla, in *Natural Environments: Studies in Theoretical and Applied Analysis*, ed. J.V. Krutilla, Baltimore: Johns Hopkins University Press, 1972.
- “A Multivariate Statistical Analysis of Wilderness Users in the United States,” in *Natural Environments: Studies in Theoretical and Applied Analysis*, ed. J.V. Krutilla, Baltimore: Johns Hopkins University press, 1972.
- “Benefits or Costs? An Assessment of the Water Resources Council's Proposed Principles in Standards,” with R.K. Davis, S.H. Hanke, R.H. Haveman & L. Knetsch, in *Benefit-Cost and Policy Analysis*, ed. W. Nishkanen, et al, Chicago: Aldine Publishing Company, 1972.
- “Observations on the Economics of Irreplaceable Assets: Theory and Method in the Social Sciences,” with J.V. Krutilla, A.M. Freeman III & C. Russell, in *Environmental Quality Analysis*, ed. A Kneese and B.T. Bower, Baltimore: Johns Hopkins University Press, 1972.
- “Outdoor Recreation and Congestion in the United States,” in *Population, Resources and the Environment*, ed. R. Ridker, Washington, D.C.: U.S. Government Printing Office, 1972.
- “Benefit-Cost Analysis and Technologically Induced Relative Price Changes: The Case of Environmental Irreversibilities,” with J.V. Krutilla, *Natural Resources Journal*, 1972.

## Less Technical Articles

- “Still the Wrong Route,” *Environment*, Vol. 19, No. 1, January/February 1977.
- “National Energy Policy Plans: A Critique,” *Transportation Journal*, Winter 1976.
- “The Mandatory Oil Import Program: A Consideration of Economic Efficiency and Equity,” with W. Gillen, *Joint Economic Committee of the U.S. Congress*, 1974.
- “The Political Economy of the Energy Crisis,” with R. Haveman, *Carroll Business Review*, Winter 1974.
- “The Wrong Route,” *Environment*, Vol. 15, No. 5, June 1973.
- “A Review of the Empirical Analyses that Have Been Based Upon the National Recreation Surveys,” *Journal of Leisure Research*, Vol. 4, Spring 1972.



“How the War in Indochina is Being Paid for by the American Public: An Economic Comparison of the Periods Before and After Escalation,” *Public Forum*, July 1970, (reprinted in the *Congressional Record*, August 13, 1970).

“User Response in Outdoor Recreation: A Reply,” with J.J. Seneca, *Journal of Leisure Research*, Vol. 2, No. 2, Spring 1970.

“User Response in Outdoor Recreation: A Production Analysis,” with J.J. Seneca, *Journal of Leisure Research*, Vol. 1, No. 3, Summer 1969.

“We Must Increase Access to Alaska’s Resources,” Op-Ed in the *Washington Examiner*, August 4, 2015.

“Competitive Battlefield: A View from the Trenches,” Northeast Utilities 1987 Annual Report, *Competition: A Matter of Choices*, 1987.

### **Speeches and Papers Presented Since 1971**

“California: Going Green and Getting Regulation Right,” Law Seminars International 11<sup>th</sup> Annual Conference on Energy in California, San Francisco, CA, September 15, 2009.

“The Business Case For Energy Efficiency,” CS Week Conference, Washington, D.C., May 21, 2009.

“Back to The Future: Energy Planning and Lessons for the 1970’s,” Third Annual Nelson Institute Earth Day Conference, Madison, WI, April 22, 2009.

“Energy Efficiency and Regulatory Incentives,” EUEC 11<sup>th</sup> Annual Energy and Environment Conference, Tucson, AZ, January 27-30, 2008.

“Conservation Reconsidered: A First Row Seat,” Reconsidering “Conservation Reconsidered”: A 40-Year Legacy, Resources for the Future, October 3, 2007.

“Market Issues: Power Procurement & Contracts,” Law Seminars International, San Francisco, CA, September 17-18, 2007.

“Economists as Appraisers, Threats or Compliments?” Appraisal Institute Seminar, Los Angeles, CA, March 26, 2007.

“The Economic Health of California’s Energy Markets,” An Economist’s Perspective on the Electronic Health of CA Energy Markets, San Francisco, CA, September 26, 2006.

“California’s Electricity Supply and Demand: Reality Check 2006,” Electricity Policy Roundtable, San Francisco, CA, February 17, 2004.

“Solving California’s energy Problems: A Pragmatic Approach,” University of Southern California, Los Angeles, CA, September 12, 2003.

“Lessons from California to Russia,” Edison Electric Institute’s US/Russia Electricity Markets Conference, Washington, D.C., February 25, 2003.



- “Measuring the Effects of Natural Resource Damage and Environmental Stigma on Property Value and Health,” April 30, 2002.
- “State Regulation Is Here to Stay: Financing the Future,” NARUC 113th Annual Convention, Philadelphia, PA, November, 2001.
- “Deregulation Revisited: The Power Crisis in California,” New York University’s Energy Forum, New York, NY, February 26, 2001.
- “The Changing Face of Utilities,” Arthur Andersen 21st Annual Energy Symposium, Houston, TX, November 28-29, 2000.
- “Lessons for Bangladesh: Thinking Globally While Acting Locally,” The World Bank’s Bangladesh Power Sector Reforms Workshop, Dhaka, Bangladesh, October 1, 2000.
- “Some Global Insights on Power Sector Reform in Bangladesh,” The World Bank’s Bangladesh Power Sector Reforms Workshop, Dhaka, Bangladesh, October 1, 2000.
- “Diversification and Shareholder Value,” The Energy Daily’s 27th Annual Conference: Lighting the World, Williamsburg, VA, December 2, 1999.
- “Challenges for Government-Owned Utilities,” The Bond Buyer Public Power Conference, Santa Monica, CA, October 7, 1999.
- “Restructuring America’s Electricity Industry and Public Power or Customer Owned Utilities,” APPA’s CEO Roundtable, Scottsdale, AZ, March 3, 1998.
- “Electricity Restructuring: The Future Role of Regulation (Woulda, Shoulda, Coulda),” American Bar Association’s Annual Electricity Conference, Denver, CO, February 13, 1998.
- “Mergers in the Utility Industry,” Arthur Anderson’s 18th Annual Energy Symposium, Houston, TX, December 9, 1997.
- “Convergence, Competition, Mergers and Marketing: Are You Getting Ready for the Millennium?” California Foundation on the Environment and the Economy, Santa Cruz, CA, December 4, 1997.
- “Electric Utility Strategy: Regulation, Restructuring and Competition,” The Fourth Annual Power Industry Forum: “A View Toward the New Energy Corporation,” San Diego, CA, March 7, 1997.
- “Restructuring Energy Markets: A World Perspective,” The Energy Daily’s 22<sup>nd</sup> Annual Conference: *The One-Stop Energy Stop*, Williamsburg, VA, December 12, 1996.
- “Mergers in the Utility Industry,” Arthur Anderson’s Energy Symposium, Houston, TX, December 10, 1996.
- “Political, Economic, and Regulatory Challenges when Transforming Privately-Owned Utilities to Competitive Enterprises,” Presentation at the Economist Conferences, Bilbao, Spain, November 12, 1996.
- “Transmission, Divestiture, and the Future,” Panelist at the EEI Strategic Planning Conference, Seattle, WA, October 14, 1996.





- “Merger Mania,” Utilities AIS Conference, St. Charles, IL. October 1-2, 1996.
- “Cost-of-Service Regulation: The Old Dog Won’t Hunt, and Recently, It Wasn’t Very Good,” Presentation to the Board of Wisconsin Electric Power Company, Belize, Central America, April 3, 1996.
- “Primary Mergers: An Insider’s Guide,” Electric Utility Week Conference, March 15, 1996.
- “Merger Policy Issues—When is a Proposed Electric Utility Merger in the Public Interest?” Panelist at the 3<sup>rd</sup> Annual DOE-NARUC National Electricity Forum, December 5, 1995.
- “Measuring the Effects of Natural Resources Damage and Environmental Stigma on Property Value,” Presented to Morgan, Lewis & Bockius, November 29, 1995.
- “Strategy for a Natural Gas Distributor: Competition, Consolidation, Cost Cutting,” Washington Gas Light, October 23, 1995.
- “Strategic Issues Facing the Electric Utility Industry,” AIS Symposium, St. Charles, IL, October 9, 1995.
- “Worldwide Electricity Restructuring: Regulation, Competition or Both?” presented at the 4<sup>th</sup> World Economic Development Congress, Washington, D.C., October 6, 1995.
- “Competition, Consolidation, Restructuring: A Program for Expanding Utility Consulting,” Western Region Utility Presentation, September 28, 1995.
- “North/South Estimated Savings Compared to Recent Merger Claimed Savings,” for PSCo information only, July 28, 1995.
- “California PUC Plans for Restructuring the Electric Industry,” Utilities Overheads, July 3, 1995.
- “Public Utility Holding Company Act (PUHCA) Current Issues,” Utilities Overheads, July 3, 1995.
- “Power Industry Restructuring: Competition and Deregulation are Not Synonyms,” Utilities Overheads, July 3, 1995.
- “The FERC’s Role in Electric Utility Industry Restructuring,” Utilities Overheads July 3, 1995.
- “Where to Regulation? Slice and Dice Supplants Command and Control,” HARC Presentation, August 8, 1995.
- “Strategic Issues Facing the Electric Utility Industry,” US West Presentation, August 1, 1995.
- “Proposal to Provide Consulting Services to Assist with An Alternative Ratemaking Proposal,” Boston Gas Presentation, July 27, 1995.
- “Strategic Issues Facing the Electric Utility Industry,” ConEd Presentation, July 26, 1995. (Also “Power Thinking”)
- “Strategic Issues Facing the Electric Utility Industry,” NU Board of Trustee Presentation, July 25, 1995.
- “Public Utility Holding Company Act (PUHCA),” Presentation to Southwest Gas Corporation, June 19, 1995.



- “FERC Activity-Gas Industry Update,” Presentation to Southwest Gas Corporation, June 19, 1995.
- “Electric Industry Restructuring Recent FERC and CPUC Developments,” Presentation to Southwest Gas Corporation, June 19, 1995.
- “Power Marketing and Bulk Power Markets: Power Marketing and its Impact on the Electric Power Industry,” Infocast’s Power Marketing and Bulk Power Markets, June 8, 1995.
- “Energy Industry in Transition,” Yankee Energy Systems presentation, May 23, 1995.
- “State Regulation in an Era of Regulated Competition,” American Enterprise Energy Policy Forum, May 16, 1995.
- “Natural Resource Damages Latest Developments and Future Focus,” The CVM Controversy. Executive Enterprises NRDA Conference, May 5, 1995, San Francisco, CA.
- “Restructuring the Electric Industry,” Prepared for Georgia Power Company, March 28, 1995.
- “Electric, Gas and Telephone Industry Insights and Outlooks,” Prepared for Peoples Energy Corporation Officers’ Planning Retreat, March 12, 1995.
- “The Driving Forces Reshaping the Electric Power Industry,” Presentation to Northeast Utilities Management, February 27, 1995.
- “Electricity Markets: Yesterday, Today, and Tomorrow,” and “The Driving Forces Reshaping the Electric Power Industry,” Presentation to General Electric, February 13, 1995.
- “Power Marketing and Its Role in the Competitive Energy Industry: Projecting Future and International Power Needs,” EEI Conference, January 27, 1995.
- “Evolution or Revolution: Whoever Gets the Customers Wins!” Energy Daily Conference, December 1, 1994.
- “Natural Resource Damages Latest Developments and Trends: CVM Controversy,” Executive Enterprise’s NRDA Conference, November 15, 1994.
- “The Current Natural Gas Transportation Issues that Affect the North American Market,” IGUA/ACIG Natural Gas Conference, November 15, 1994.
- “Power Marketing and Its Role in the Competitive Energy Industry: Projecting Future and International Power Needs,” Infocast-New York, October 28, 1994.
- “FERC and State Regulatory Incentives: Restructuring the Electric Utility Industry,” Arthur Andersen’s Financial Symposium, September 27, 1994.
- “Restructuring the Electric Utility Industry,” Arthur Andersen’s Financial Symposium, September 27, 1994.
- “What Do We Want to Get Out of the CPUC Restructuring Process,” Aspen Institute Presentation Materials, July 6, 1994.



- “The Debate over Retail Competition in California: A Prescriptive Suggestion,” Aspen Institute Presentation Materials, July 6, 1994.
- “A Review and Critique of Internal Revenue Service Economist Report Regarding Electricity Conservation Program Expenditures and Related Tax Deductions,” EEI Taxation Committee Meeting, June 14, 1994.
- “Environmental Law, Liability & Litigation,” Director’s Roundtable, May 18, 1994.
- “Arthur Andersen Group Presentation to The Gas Company: Customer Values Initiative,” Los Angeles, California, 1994.
- “NRDA and Property Valuation Analysis,” presented to Fennemore Craig, P.C., February 28, 1994.
- “Commentary on the Future of Regulation: Pro or Kahn? (To Regulate or Not to Regulate: That is the Question,” NARUC/DOE presentation, February 15, 1994.
- “Latin America Assertion of Membership in Pacific Basin,” Aspen Institute, Pac Rim Workshop, January 31, 1994.
- “Utility Rate Regulation in the 1990s and Beyond,” 1993 Utilities Financial Symposium, September 14, 1993.
- “Natural Resource Damages: An Economic Critique,” Presented to Beveridge & Diamond (with J. Dubin), September 8, 1993.
- “Understanding Economic Damage Valuations Under NRDA,” Presented to Occidental USA, (with L. Wilde), August 17, 1993.
- “Allocating Costs in Superfund Cases,” Presented to Waste Management, July 1993.
- “Understanding Economic Damage Valuations Under NRDA,” Presented to Sidley & Austin, June 29, 1993.
- “Allocating Cost in Superfund Cases,” Presented to Keck, Mahin & Cate, June 23, 1993.
- “Draft RCRA Corrective Action Regulatory Impact Analysis (RIA),” Presented to Beveridge & Diamond, June 18, 1993.
- Chicago Energy Economic Association Speech, (CJC used notes/speech from UC Berkeley/RFF speech of May 10, 1993), June 10, 1993.
- “Understanding Economic Damage Valuations Under NRDA,” AAEC Corporate Counsel Symposium Series (Dallas & Houston), May 18-19, 1993.
- “The Regulatory Triad for the 90s: Integrated Resource Planning, Incentive, Regulation and Social Costing,” UC Berkeley/RFF Briefing, May 10, 1993.
- “Understanding Economic Damage Valuation Under NRDA,” AA/Perkins Coie Presentation, May 4, 1993.
- “DSM & Shareholder Incentive,” 1993 Rate Symposium, April 25-27, 1993.



- “Twenty Years Since Earth-Day I: What Have We Learned?” USC Economic Honor Society Omicron, Delta Epsilon, April 15, 1993.
- “The Clinton Economic Plan,” USC Panel Discussion, February 26, 1993.
- “Incorporating Externalities in Utility Least-Cost Planning,” Edison Electric Institute, February 10, 1993.
- “Incorporating Externalities in Utility Least-Cost Planning,” A Presentation to the ABA Mid-Year Meeting, February 7, 1993.
- “Understanding Economic Damage Valuations Under NRDA,” Presented at “OPA-On the Gulf Coast,” Seminar, sponsored by Haight, Gardner, Poor & Havens, January 27, 1993.
- “DSM and Shareholders Incentives,” Prepared for Southern California Edison, January 1993.
- “DSM and Shareholders Incentives,” Prepared for the Allied Social Science Association 1993 Annual Meetings, January 5, 1993.
- “Social Cost of Electricity,” Panel Discussant, Anaheim, CA, January 5 & 6, 1993.
- “Environmental Externalities: Are There Any Left?” American Bar Association’s Winter Meeting. Boston, MA, February 7, 1993.
- “Incorporating Externalities in Utility Least-Cost Planning,” Edison Electric Institute Energy and Environmental Committee, San Francisco, CA, February 10, 1993.
- “Environmental Policy: The Good, The Bad, The Ugly,” University of Southern California - Los Angeles, CA, February 25, 1993.
- “Incorporating Environmental Strategies into Your Corporation’s Overall Strategy to Improve the Bottom Line,” moderator, Arthur Andersen & Co. 1993 Energy Expo, Pittsburgh, PA, March 2-3, 1993.
- “Resource Planning, Incentives, and Pricing for Electric, Natural Gas, and Telecommunications Services: New Products and Regulations,” University of Missouri’ 1993 Rate Symposium, Kansas City, MO, April 26, 1993.
- “An Economist’s View of Demand Side Management,” Chicago Energy Economists Association, Chicago, IL, June 10, 1993.
- “Presentation to the Board of Southwest Gas,” Las Vegas, NV, June 14, 1993.
- “Draft RCRA Corrective Action Regulatory Impact Analysis (RIA),” Beveridge & Diamond, June 18, 1993.
- “Where Do We Go From Here: Bush or Clinton?” Presented at the Corporate Recovery Conference sponsored by Arthur Andersen & Co., Scottsdale, AZ, September 17, 1992.
- “The Economic Effect of the Clean Air Act on the U.S. Economy: Tradable Emissions Allowances,” National Clean Air Conference, Houston, TX, May 20, 1992.
- “Electric Utility Industry Through 2000,” Fluor Daniel Power Sector Meeting, San Diego, CA, January 28, 1992.



- “Valuation of Natural Resource Damages: Evolution of a Process,” Executive Enterprises, Inc. Conference Natural Resource Damages Claims and Litigation “Problems in Valuation,” November 7, 1991.
- “The Evolution of the Electric Utility Sponsored Conservation Movement in North America: Remembrance of Things Past,” Demand Side Management: A Current and Future Resource Conference Sponsored by the Commission of the European Communities and the International Energy Agency; Copenhagen, Denmark, October 23, 1991.
- “Are There Any Economic Efficiency Arguments for Embracing Utility-Sponsored Conservation Programs?” WEA International Conference, Seattle, WA, June 29, 1991.
- “National Resource Damages: What Does the Proposed Final DOI Rule Mean?” Presented at the Workshop on Natural Resource Damages, Washington, D.C., May 30, 1991.
- When Green Turns Mean: Pollution as a Crime,” Emerging Environmental Policies and Business Conference, University of North Carolina State University, April 18, 1991.
- “When Green Turns Mean: Pollution as a Crime,” Presented at the Third Annual Law and Economics Seminar of Putnam, Hayes & Bartlett, Inc., The Arizona Biltmore Hotel, Phoenix, AZ, November 7-11, 1990.
- “The Legal and Economic Consequences of 1992,” Presented at the Second Workshop on Post Keynesian Economics, Knoxville, TN, July 3, 1990.
- “Environment: A Green Gimmick or a New Game Plan?” Presented at Pacific Gas & Electric Company’s Managers Meeting, San Francisco, CA, May 31, 1990.
- “Energy Firms and Global Environmental Policy,” 1990 PacRim Workshop, Seoul, Korea, May 16, 1990.
- “Can the Gas Business Fulfill Its New Promise?” Presented at “Inside F.E.R.C.,” San Francisco, CA, April 20, 1990.
- “Energy Firms and Global Environmental Policy,” Presented at Pacific Gas & Electric’s Management Committee Retreat, Santa Cruz, CA, March 17-26, 1990.
- “Can Economic Efficiency and Demand Side Bidding Co-Exist?” Bidding for Electricity Conference, Davis, CA, March 15, 1990.
- “Electric Utility Mergers and Reorganization: Antitrust Meets Regulation,” Presented at the Third Annual Conference on Electric Law and Regulation, Denver, CO, March 9, 1990.
- “Infrastructure, Regulatory, Risk/Reward Issues,” Presented at the Portland General Symposium, Portland, OR, November 6, 1989.
- “Belated and Expensive: How Utilities Have Reacted to New Economic Imperatives in the Last Two Decades,” Conference Sponsored by the Energy Daily, The Watergate Hotel, Washington, D.C., November 3, 1989.
- “Competitive Building: Price, Time, Location and Uncertainties,” Presented at the Coopers & Lybrand Annual Electric & Gas Conference, Crystal Gateway Marriot, Arlington, VA, November 2, 1989.



- “Electric Utilities: New Markets, New Challenges,” Speech before the Interstate Natural Gas Association of America Seminar, The Greenbrier, White Sulphur Springs, West Virginia, October 17, 1989.
- “Sweetening the Pot: Plaintiff Devices to Maximize Claims (Contingent Value Surveys Hedonic Price Measures),” Second Annual Law and Economics Seminar a Putnam, Hayes & Bartlett, Inc., The Arizona Biltmore Hotel, Phoenix, AZ, October 11-14, 1989.
- “Incentive Regulation and Conservation Policy,” Presented at the New England Conference of Public Utility Commissioners, Kennebunkport, ME, September 2, 1989.
- “Incentive Regulation and Conservation Policy,” Presented at the New England Conference of Public Utility Commissioners (NARUC) Least-Cost Planning Conference, Charleston, SC, September 11, 1989.
- “Twenty Years Since Earth Day I: What Have We Learned,” 7<sup>th</sup> International Oil and Gas Conference, Cambridge, MA, June 1-2, 1989.
- “The Resurgence of Political Economy in Regulated Industries,” Law and Economics Seminar, London, England, May 18, 1989.
- “Back to the Future in Gas and Electric Industries,” Annual Meeting of the Federal Bar Association, Washington, D.C., May 5, 1989.
- “The Role of Rate Reform: The Bundling of Services,” International Association of Energy Economists, North American Gas Supply and Markets Conference, The Hyatt Regency, Denver, CO, September 7, 1989.
- “Incentive Regulation: What Works and What Doesn’t,” Presented at the Great Lakes Conference of Public Utility Commissioners, The Greenbrier, White Sulphur Springs, WV, July 11, 1989.
- “New Proposals for Incentive Regulation in the Electric Utility Industry,” Chief Executives’ Forum, Key Largo, FL, Sponsored by the First Boston Corporation and Putnam, Hayes & Bartlett, Inc., February 9-12, 1989.
- “Current Trends in Regulation and Some New Proposals to Alter Incentives in the Electric Utility Industry,” Harvard Utility Forum Meeting, Cambridge, MA, February 2, 1989.
- “Some New Proposals to Introduce Incentive Tariffs in the Electric and Natural Gas Industries,” Utility Discussion Group, Held by Putnam, Hayes & Bartlett, Inc., Capital Hilton, Washington, D.C., January 5, 1989.
- “Privatization in Developing Countries: Case Studies of Electricity in Turkey and Pakistan,” EESIG Brown-Bag Lunch, December 14, 1988.
- “Some New Proposals to Introduce Incentive Tariffs in the Electric and Natural Gas Industries,” Harvard Utility Forum – Harvard Gas Forum Demand-Side Bidding/Alternatives to Rate Base Regulation Workshop, Cambridge, MA, December 13, 1988.
- “The March Towards a Competitive Gas Industry: Obligation to Serve, Incentive Regulation, and Risk Allocation,” The Interstate Natural Gas Association of America Seminar, Washington, D.C., December 2, 1988.





- “Pricing and Contracting Issues and Experience,” Presented at the AIT/ASEAN Senior Executive Seminar, Hua Hin, Thailand, November 9-11, 1988.
- “Some Thoughts on Why and How to Initiate Private Power in Pakistan,” ASEA/AIT/USAID Senior Executive Seminar in Co-Generation and Private Power, Hua Hin, Thailand, November 1988.
- “Meeting the Nation’s Future Electricity Needs: Cogeneration, Competition and Conservation,” Presented at the 100<sup>th</sup> Annual Convention and Regulatory Symposium of the National Association of Regulatory Utility Commissioners, San Francisco, CA, November 2, 1988.
- Speech before the New Dimensions in Pricing Electricity Conference of Niagara Mohawk Power Corporation and the Electric Power Research Institute, “Cogeneration and Competition,” Syracuse, NY, September 30, 1988.
- Speech before the Second Annual Conference of the American Cogeneration Association, “Cogeneration and Competition,” Chicago, IL, September 26, 1988.
- “Valuing Damages to Natural Resources in Environmental Litigation,” Presentation before the American Bar Association Annual Meeting, Toronto, Ontario, CAN, August 8, 1988.
- “Decision Making and Environmental Risks: Economic and Political Issues An Executive Summary,” The Robert M. La Follette Institute of Public Affairs, The University of Wisconsin-Madison, June 1988.
- Comments Before the American Bar Association First Annual Conference on Electricity Law and Regulation, Denver, CO, April 7-8, 1988.
- “After the Chaos: Gas Strategies for the Long Term,” Inside F.E.R.C.’s Eight Annual Conference, New Orleans, LA, March 21-22, 1988.
- “Wholesale Electricity, Old Scar-Tissue: New Wounds Versus New Solutions,” before the National Governors’ Association, Washington, D.C., December 10, 1987.
- “Recent Changes in Natural Gas Transportation and Marketing: What, if Anything, Can They Tell Us About Electricity Reform?” Seventh Annual Electricity and Gas Executives Conference, First National Bank of Chicago, September 21, 1987.
- “U.S. Economic Regulation of Electricity,” with Miles Bidwell, NERA Seminar, London, England, June 26, 1987.
- “Pricing and Energy Policy in Wisconsin and the United States,” Workshop on Energy, The Economy, and the Environment, IIASA, Laxenburg, Austria, June 23-25, 1987.
- “State Regulation in the Natural Gas Revolution,” presented at Proceeding of Gas Mart ’87, The First National Trade Fair for Natural Gas, sponsored by *Natural Gas Intelligence*, Washington, D.C., May 3-5, 1987.
- “Can Natural Gas Deregulation be a Model for the Electric Industry?” Speech given at the First Rutgers/New Jersey Department of Commerce Annual Conference on Energy Policy in the Middle Atlantic States, February 20, 1987 (also published in *Energy Deregulation and Economic Growth*).



- “Are Energy Efficiency Programs Worth It?” with Suellen M. Curkendall, IAEE Conference, MIT, Cambridge, MA, November 19-21, 1986.
- “Marketing Strategies for Natural Gas Distributors in the 1900s,” before the Gas Utility Managers Conference Sponsored by the New England Gas Association, September 7-9, 1986.
- “Conservation and Cogeneration: The Utilities’ Friends or Foes?” with M. Berkman, S. Curkendall and H. Parmesano, before the NERA Electric Utility Conference, Scottsdale, AZ, February 12-15, 1986.
- “The Future Competitive Environment for Utilities,” remarks prepared for Dayton Power & Light Company 1985 Interdivisional Meeting, December 9, 1985.
- “The Final Rule for Natural Gas Carriage,” Presentation before the Ohio Electric Association, Cincinnati, OH, October 23, 1985.
- “The FERC’s Recent Interest in Wheeling and Carriage,” co-authored by Robert D. Obeiter, before the Ninth Annual News Media Seminar, Columbus, Ohio, and the Third NARUC Electric Research and Development Seminar, St. Charles, IL, October 22, 1985.
- “The Regulatory World of Natural Gas: Are We Quitting the Game or Changing the Rules?” before the Natural Gas Supply Association 1985 Annual Meeting, Miami, FL, October 10, 1985.
- “Marginal Cost and Competition: Unbundling Natural Gas Carriage,” before the Advanced Seminar in Gas Pricing Policies, Sponsored by the American Gas Association, College Park, MD, October 8, 1985.
- “Commingling Competition with Regulation: Closing the Circle or Quitting the Game,” before the Iowa Investor-Owned Utilities Management Conference, Waterloo, IA, October 7, 1985.
- “The State Regulator in a Free Gas Market,” Comments Presented at a Conference Sponsored by The Gas Daily, Chicago, IL, August 1985.
- “Grafting Competition Onto Regulation: The Problems and The Promise,” before the Iowa State Regulatory Conference, Ames, IA, May 1985.
- “Comments Before The Workshop on Current Antitrust Issues in Public Utility Industries, sponsored by the American Bar Association, Washington, D.C., March 1985.
- “Yesterday, Today and Tomorrow,” Comments before the IEEE Winter Power Meeting, New York, NY, February 5, 1985.
- “Natural Gas: The Eggs Have Been Scrambled, Now What?” Before the National Association for Regulatory Utility Commissioners Annual Meeting, Los Angeles, CA, November 1984.
- “The Performance of the Regulation of Public Utilities in the U.S., “A NERA Seminar: Is American-Style Regulation Appropriate to the UK?” London, England, October 1984.
- “A Strategy for Implementing Electricity Tariff Reform and Load Management in Korea,” Seoul, Korea, 1982.
- “The National Energy Act and State Utility Regulation,” NARUC Convention, Las Vegas, NV, November 1982.





“Time of the Electricity Pricing: Correcting Some Continuing Confusion,” NARUC Annual Convention, New Orleans, LA, November 16, 1977.

“Our Energy Crisis and Education: A Critical Assessment,” Council for Educational Development and Research Conference on Education Confronts Energy Conference, Washington, D.C., June 22, 1977.

“Alaskan Oil and Gas: The Wrong Route Revisited,” American Association for the Advancement of Science, Denver, CO, February 22, 1977.

The At Rann II Symposium, Prepared Summary of NSF Study to Provide a Practical Guide for the Analysis of the Marginal Cost Structure of Electric Utilities for the Purpose of Designing Electricity Tariffs, Washington, D.C., November, 1976.

Prepared Remarks “Cost/Benefit Aspects of Non-Waste Technology and Production,” presented at the NWT Seminar, Seminar on the Principles and Creation of Non-Waste Technology, Paris, France, November, 1976

The Advest Seminar comments entitled “Meeting Experiments,” at New York, NY, October, 1976.

The Annual Meeting of American Economic Association,” Nixon-Ford National Policy Plans: A Critique,” Atlantic City, New Jersey, September, 1976.

The NARUC annual Regulatory Studies Program, Prepared Remarks “Excerpt from the Marginal Cost and Pricing of Electricity: An applied Approach,” East Lansing, MI, August, 1976.

Prepared Remarks before the 1976 Symposium on Rate Design Problems of Regulated Industries, “The Marginal Cost of Electricity and Continuing Rate Controversies,” Kansas City, MO, February, 1976.

Prepared Remarks before the Wisconsin Manufacturing Association in Stevens Point, WI, September, 1975.

“Public Utility Pricing, Conservation and Ecology,” NARUC Annual Regulatory Studies Program, Michigan State University, East Lansing, MI. August 1975.

“Energy Pricing: The Growing Consumer Burden,” Third National Seminar for Consumer Representatives in State and Local Government. Milwaukee, WI, July, 1975.

“New Approaches to Public Utility Rate Setting,” Third National Seminar for Consumer Representatives in State and Local Government, Milwaukee, WI, July, 1975.

“The Design of Electricity Tariffs,” Upper Great Lakes Utilities Commission. Greenbriar, West Virginia. July 1975.

“Time of Day Pricing: WHY and HOW,” Joint Conference by the Federal Energy Administration, the American Public Power Association, the Edison Electric Institute, the National Association of Regulatory Utility Commissioners, and the National Electric Cooperatives Association. Washington, D.C., June, 1975.

Prepared Remarks before the Institute of Public Utilities, Michigan State University, East Lansing, MI, May, 1975.



“The Energy Game: Who are the Players?” 49<sup>th</sup> Annual Convention of the Wisconsin Petroleum Association, April 2, 1975.

“Implementing Time-of-Day Pricing of Electricity: Promises and Pitfalls,” Atlanta, GA. March, 1975.

Prepared remarks “The Time has Come to Speak Out On Our Energy and Economic Crisis,” Madison, WI, March, 1975.

Prepared Remarks before The American Association for the Advancement of Science at the Minnesota Energy Agency Conference, 1975,” Energy Pricing in the United States: A Critique,” 1975.

“Benefit Cost Analysis and the National Environmental Policy Act,” Proceedings of the American Bar Association, 1975.

“Electricity Price Regulation: Critical Crossroads or New Group Participation Sport,” Ames Public Utility Conference and the Midwest Association of Regulated Utilities Conference, both 1974.

“Implementing Diurnal Pricing: A Pragmatic Approach,” At the Regulatory Information Systems Conference. St. Louis, MO. 1974.

“An Economist Views the National Environmental Policy Act and the Environmental Impact Statement,” Public Choice Meetings, American Bar Association Annual Meeting, College Park, MD, March, 1973.

“Electricity Growth: Economic Incentive and Environmental Quality,” With W. Gillen. Conference on Energy: Demand and Institutional Problems, February, 1973.

“Some Economic Implications of the NEPA,” Public Choice Meetings, American Bar Association Annual Meeting, Washington, D.C., 1973.

“Regression Analysis with Dichotomous Dependent Variables,” With V. Kerry Smith. Toronto, CAN, December, 1972.

“Optimality in Producing and Distributing Public Outputs,” The American Economic Association, December, 1971.

“Preservation Versus Development: Some Economic Issues,” with J.V. Krutilla, Econometric Society Meetings, December, 1970.

## **CIVIL PROCEEDINGS AND RELATED LEGISLATIVE TESTIMONY**

Before the U. S. District Court for Northern California, 2019, Declaration and Deposition in a matter related to contract termination based in part on the feasibility of burning wood as a renewable energy resource compared to solar and wind power on the Big Island of Hawaii.

Testimony in the Matter of an Arbitration (Alberta) between TransAlta Generation Partnership and the Balancing Pool, in the matter of the definition of Rate Base and Net Book Value, April, 2019.



Before the U.S. District Court, Southern District of California, Expert Report in San Diego Unified Port District v. Monsanto for plaintiff in Case No. 3:15-CV-0578, April 5, 2019.

Expert Report in the Matter of an Arbitration (Alberta) between TransAlta Generation Partnership and the Balancing Pool, in the matter of the definition of Rate Base and Net Book Value, January, 2019.

Before the Superior Court of California, County of Los Angeles, Expert Report in Shell Oil Company v Barclay Hollander Corporation, Case No. BC544786, June 15, 2017.

Before the Superior Court of California, County of Los Angeles, Declaration in Support of Plaintiff's Motion for Class Certification, Imhoff v Goin, Case No. BC593161, January 3, 2017.

Before the United States District Court for the District of Arizona, Declaration in Support of the Navajo Transitional Energy Company's Motions to Dismiss, October 26, 2016.

Before the United States District Court for the District of Arizona, Declaration in Support of the Navajo Transitional Energy Company's Motions to Intervene, August 26, 2016.

Before the American Arbitration Association, Declaration in Opposition to Motion for Summary Judgment, *U.S. Topco, Inc. v. Ever Energy Co., Ltd.*, Case No. 01-15-0002-6291, June 30, 2016.

Before the Supreme Court of the State of New York, County of Albany, Affidavit in Support of National Energy Marketers Association's Application for an Order to Show Cause for a Temporary Restraining Order and Permanent Injunction, Index No. 868-16, May 9, 2016.

Expert Report in the Matter of an Arbitration (Alberta) between TransAlta Generation Partnership, ENMAX Energy Corporation, and the Balancing Pool, December 18, 2015.

Before the United States District Court for the District of Colorado Supplemental Expert Report in the matter of *Arkansas River Power Authority (ARPA) v. Babcock & Wilcox Power Generation*, in re ARPA's Conversion of the Lamar Power Plant to Coal from Natural Gas, July 27, 2015.

Before the United States Supreme Court, Amicus Curiae Brief of Charles J. Cicchetti (sole author) on behalf of Petitioners in *Federal Energy Regulatory Commission v. Electric Power Supply Association, et. al.*, Nos. 14-480 & 14-841, July 2015.

Before the United States District Court for the District of Colorado, Expert Report of in the matter of *Arkansas River Power Authority (ARPA) v. Babcock Wilcox Power Generation*, in re ARPA's Conversion of the Lamar Power Plant to Coal from Natural Gas, April 6, 2015.

*New Jersey Department of Environmental Protection, et al. v. Occidental Chemical Corporation, et al.*, Superior Court of New Jersey Law Division—Essex County, Docket No. ESX-L-9868-05), Expert Report Estimating Economic Damages Related to Dioxin at Lister Avenue and the Passaic River, March 13, 2014.

In the Matter of Arbitration Proceedings Concerning Disputes with to TAGP'S July 26, 2012 Notice of Force Majeure at Sundance Generating Station Unit 6, Among TransAlta Generation Partnership (TAGP) and Capital Power PPA Management, Inc. (CPPMI) and Balancing Pool (Balancing Pool), Expert Report November 13, 2013.



Before the Superior Court of New Jersey Law Division: Union County, Union County Docket No.: UNN-L-2601-11, *Lionetti Associates, LLC t/a Lorco Petroleum Services v. City of Elizabeth, City Council of the City of Elizabeth and Liberty Water Company v. Joint Meeting of Essex and Union Counties*, Deposition Transcript, November 1, 2013.

Before the Superior Court of New Jersey Law Division: Union County, Civil Action Docket No.: UNN-L-0556-10, *Papetti's Hygrade Egg Products, Inc. v. City of Elizabeth, City Council of the City of Elizabeth and Liberty Water Company*, Expert Report, April 1, 2013.

Before the United States District Court for the District of Colorado, Civil Action No. 1:12-cv-01275-JLK, *Diné Citizens Against Ruining our Environment v. Kenneth Salazar*, Declaration August 2012.

Before the Supreme Court of the United States, *Metropolitan Edison Company and Pennsylvania Electric Company v. Pennsylvania Public Utility Commission*, On Petition for a Writ of Certiorari to the Commonwealth Court of Pennsylvania, Motion for Leave to File Brief as Amici Curiae in Support of Petitioners and Brief of Electrical Engineers, Scientists and Economists as Amici Curiae in Support of Petitioners, August 1, 2012.

Before the United States Court of Appeals for the Tenth Circuit, Nos. 11-9552, 11-9557 & 11-9567, On Petitions for Review of Final Action of the United States Environmental Protection Agency, Declaration in Support of the Navajo Nation's Amicus Brief, May 18, 2012.

Before the State Assessment Review Board, Prepared Supplemental Testimony on behalf of Anadarko Petroleum, Case No. P-08-9, May 9, 2012.

Expert Rebuttal Report In the Matter of Arbitration Proceedings Concerning Disputes with Respect to Units 1 & 2 at Sundance Generating Station among TransAlta Generation Partnership, TransCanada Energy LTD. and Balancing Pool, March 27, 2012.

Expert Report in the Matter of Arbitration Proceedings Concerning Disputes with Respect to Units 1 & 2 at Sundance Generating Station among TransAlta Generation Partnership, TransCanada Energy LTD. and Balancing Pool, February 3, 2012.

Before the United States District Court for the District of Colorado, Civil Action No. 1:11-cv-002243-REB-CBS, *Center for Biological Diversity, et al v. Joseph Pizarchik*, Affidavit on behalf of the Navajo Nation, in Support of Limited Motion to Intervene and Motion to Dismiss; June 13, 2011.

Before the Superior Court for the State of Alaska, Third Judicial District of Anchorage, in *BP Pipelines (Alaska), et al. v. Alaska Department of Revenue et al.*, Videotaped Deposition Transcript, June 8, 2011.

Before the Superior Court for the State of Alaska, Third Judicial District of Anchorage, in *BP Pipelines (Alaska), et al. v. Alaska Department of Revenue et al.*, Rebuttal Expert Report, May 11, 2011.

Before the Circuit Court of the State of Oregon, Linn County, Trial Testimony on behalf of PacifiCorp in the matter of *Wah Chang v. PacifiCorp*, Case No. 002578, April 24, 2011.

Before the Superior Court for the State of Alaska, Third Judicial District of Anchorage, in *BP Pipelines (Alaska), et al. v. Alaska Department of Revenue et al.*, Expert Report, March 3, 2011.



Before the Superior Court of New Jersey Law Division—Essex County, New Jersey *Department of Environmental Protection et al. v. Occidental Chemical Corporation, et al.*, Docket No. ESX-L-9868-05, Expert Report on Damages Related to Lister Avenue, December 2010.

Before the Superior Court for the State of California, County of San Diego, *City of Oceanside v. Dow Chemical*, Docket No. 05-439807, Expert Report on behalf of the City of Oceanside, July 2010.

Before the U.S. Bankruptcy Court for the District of Delaware, *In re Semcrude*, Case No. 08-11525 BLS, on behalf of the Unsecured Creditors of Semcrude L.P. Expert Analysis of Trading Data, February 2010.

Before the District Court of Chambers County, Texas, Oral Videotaped Deposition *In re David Jenkins, et al. vs. Entergy Jenkins Corporation, et.al.*, Cause No. 20666, December 15, 2009.

Before the District Court of Chambers County, Texas, Expert Report on Behalf of Defendants, In re: *David Jenkins, George W. Strong, Francis N. Gans and Gary M. Gans vs. Entergy Corporation, Entergy Services, Inc., Entergy Power, Inc., Entergy Power Marketing Corporation, Entergy Arkansas, Inc., and Entergy Gulf States, Inc.*, Cause No. 20666, October 16, 2009.

Before the Superior Court for the State of Alaska, Third Judicial District at Anchorage, Affidavit In re: *Tesoro Alaska Company v. Union Oil Company of California, Unocal Pipeline Company, Unocal Corporation*, Case No. 3AN-05-5877 Civ, September 9, 2009.

Before the Supreme Court of the United States, *NRG Power Marketing, LLC, et al., Petitioners, v Main Public Utilities Commission, et.al.*, Respondents, On Writ of Certiorari to the United States Court of Appeals for the District of Columbia Circuit, Brief as *Amici Curiae* in Support of Petitioners, July 14, 2009.

Before the Superior Court of New Jersey Law Division – Essex County, *New Jersey Department of Environmental Protection et al. v. Occidental Chemical Corporation, et al.*, Docket No. ESX-L-9868-05, Expert Report on a Comparison of Damage Theories, June 15, 2009.

Before the Superior Court for the State of Alaska, Third Judicial District at Anchorage, Rebuttal Report In re: *BP Pipelines (Alaska) Inc., Exxon Mobil Pipeline Company, Unocal Pipeline Company, Conoco Phillips Transportation Alaska, Inc. and Koch Alaska Pipeline Company, Owners, and Alyeska Pipeline Service Company, as Agent for the Owners, Fairbanks North Star Borough and City of Valdez v. State of Alaska Department of Revenue, State Assessment Review Board, and North Slope Borough*, Case No. 3AN-06-08446 CI, May 15, 2009. Deposition taken on May 28, 2009.

Before the United States District Court Southern District of Mississippi Jackson Division, Declaration In re: *The State of Mississippi, ex rel. Jim Hood, Attorney General for the State of Mississippi v. Entergy Mississippi, Inc., et al.*, No 3:08cv780-HTW-LRA, May 4, 2009.

Before the United States District Court Southern District of Mississippi Jackson Division, Supplemental Declaration In re: *The State of Mississippi, ex rel. Jim Hood, Attorney General for the State of Mississippi v. Entergy Mississippi, Inc., et al.*, No 3:08cv780-HTW-LRA, May 15, 2009.

Before the District Court of Chambers County, Texas, Oral Videotaped Deposition *In re David Jenkins, et al. vs. Entergy Jenkins Corporation, et.al.*, Cause No. 20666, December 15, 2009.





Before the District Court of Chambers County, Texas, Expert Report on Behalf of Defendants, In re: *David Jenkins, George W. Strong, Francis N. Gans and Gary M. Gans vs. Entergy Corporation, Entergy Services, Inc., Entergy Power, Inc., Entergy Power Marketing Corporation, Entergy Arkansas, Inc., and Entergy Gulf States, Inc.*, Cause No. 20666, October 16, 2009.

Before the Superior Court for the State of Alaska, Third Judicial District at Anchorage, Expert Report In re: *BP Pipelines (Alaska) Inc., Exxon Mobil Pipeline Company, Unocal Pipeline Company, Conoco Phillips Transportation Alaska, Inc. and Koch Alaska Pipeline Company, Owners, and Alyeska Pipeline Service Company, as Agent for the Owners, Fairbanks North Star Borough and City of Valdez v. State of Alaska Department of Revenue, State Assessment Review Board, and North Slope Borough*, Case No. 3AN-06-08446 CI, April 8, 2009.

Before the United States District Court for the District of Nevada, Declaration in re *Western States Wholesale Natural Gas Antitrust Litigation* (McGraw Hill), Base Case No, 2:03-cv-01431-PMP-PAL, MDL Docket No. 1566, April 9, 2009.

Before the Superior Court of California, County of Los Angeles, Declaration in re *Joseph Ward-Wallace v. City of Los Angeles, Dennis Ellement, Jim Digrado, Randall Judd and Does 1 thorough 100, Inclusive*, Case No.: BC 358255, February 4, 2009. Deposition on January 26, 2009.

Before the Chancery Court of Hinds County, Mississippi, First Judicial District, Affidavit in re *State of Mississippi v. Entergy Corporation*, Cause No. G2008-1540, November 6, 2008.

Before the United States District Court Southern District of Mississippi Jackson District, Declaration in re *Entergy Corporation, Entergy Mississippi, Inc. and Entergy Services, Inc. v. Jim Hood, Attorney General of Mississippi, Scott A. Johnson, Special Assistant Attorney General of Mississippi, and Lee McDivitt, Investigator, Mississippi Attorney General's Office, Consumer Protection Division*, Civil Action No. 3:08-CV-541-WHB-LRA, September 12, 2008.

In the United States District Court for the Central District of Illinois Springfield Division, Expert Report on Behalf of Enbridge Pipelines (Illinois) LLC, In re: *Carlisle Kelly and Deanna Kelly v. Enbridge (US) Inc.*, January 22, 2008.

Before the Supreme Court of the United States, *Morgan Stanley Capital Group Inc. v. Public Utility District No. 1 of Snohomish County, Washington, et al.*, On Writ Certiorari to the United States Court of Appeals for the Ninth Circuit, Brief as *Amici Curiae* in Support of Petitioners, September 12, 2007.

Before the State Assessment Review Board, State of Alaska, Report in the Matter of *Trans-Alaska Pipeline System v. Oil and Gas Property Tax* (AS 43.46) 2007 Assessment Year, Appeal of Revenue Decisions, No. 07-56-06 & No. 07-56-07, May 17, 2007.

Before the Superior Court of California County of Placer, Expert Report In People of the *State of California, ex rel. Edmund G. Brown, Jr., Attorney General of California, State Air Resources Board and the Placer County Air Pollution Control District v. Sierra Pacific Industries, Inc.*, No. SCV 17449, March 19, 2007.

Before the United States Bankruptcy Court for the Southern District of New York, Expert Report in *Enron Power Marketing, Inc. vs. Virginia Electric and Power Co. d/b/a Dominion Virginia Power*, Case No. 01-16034 (AJG), November 6, 2006.



Before the Circuit Court of Holmes Mississippi, Expert Report in re *Charles U. Donald, Virginia Donald and Mary Snowden Newton, vs. Entergy Corporation, Entergy Mississippi Inc., Entergy Services, Inc., Entergy Technology Holding Company, and Entergy Technology Company*, Civil Action No. 2004-340, September 1, 2006.

Before the State Assessment Review Board, State of Alaska, Report in the Matter of the *Trans-Alaska Pipeline System v. Oil and Gas Property Tax* (AS 43.46) 2006 Assessment Year, Appeal of Revenue Decision, No.06-56-17, May 16, 2006.

Before the United States District Court of Idaho, Expert Report in *Powerex Corp v. IDACORP Energy, L.P.*, Civil Case No.CV-04-441-S-EJL, October 28, 2005.

Before the United States District Court, District of Washington, Expert Reply Report In re Calpine Corporation Securities Litigation, August 24, 2005.

Before the United States District Court, District of Nevada, Declaration In the Matter of the *Nevada Power Company v. El Paso Corporation*, No. CV-S-03-0875-RLH-RJJ, August 15, 2005.

Before the United States District Court, District of Nevada, Expert Report In the Calpine Corporation Securities Litigation, Master File No. C02-1200 SBA, August 3, 2005.

Before the State Assessment Review Board, State of Alaska, Report In the Matter of the *Trans-Alaska Pipeline System v. Oil and Gas Property Tax* (AS 43.46) 2005 Assessment Year, OAIL No. 05-0307-TAX, Appeal of Revenue Decisions, No. 05-56-12 & No. 05-56-13, May 9, 2005.

Before the United States District Court, District of Nevada, Reply To Reports of *Brett Friedman and Craig Berg in Nevada Power Company v. El Paso Corporation, et al.*, Civil Case No. CV-S-03-0875-RLH-RJJ, February 9, 2005.

Before the Court of Chancery of the State of Delaware, in and for New Castle County, Report in *VLIW Technology, L.L.C. v. Hewlett Packard Company, and STMICROELECTRONICS*, Civil Case No. 20069-NC, January 21, 2005.

Before the United States District Court, District of Nevada, Report in *Nevada Power Company v. El Paso Corporation, et al.*, Civil Case No. CV-S-03-0875-RLH-RJJ, January 10, 2005.

Before the United States District Court, District of New Hampshire. Expert Report in *Enterasys Networks, Inc. v. Gulf Insurance Company*, Civil Action No. 1:04-CV-27-SM, October 2004.

Before the United States District Court, District of Kansas, Expert Analyses in criminal proceeding related to alleged manipulation of share prices with fraudulent cable company customer count data. USA versus Barford, Kalkwarf, and Smith, August, 2004.

Expert Report In the Matter of *Idacorp Energy L.P. v. Overton Power District No. 5*, CV OC 0107870D, March 4, 2003.

Before the American Arbitration Association, Expert Affidavit on behalf of Vulcan Geothermal Power Company, Del Ranch, L.P., and CE Turbo LLC, October 2, 2002.



Before the United States District Court for the Western District of Wisconsin, Second Affidavit in Support of Plaintiffs' Motion for Summary Judgment and in Opposition to Defendants' Motion For Summary Judgment on behalf of Alliant Energy Corporation and Wisconsin Power and Light Corporation, Docket No. 00-C-0611-S, April 23, 2002.

Before the USDC, Eastern District of Virginia, Expert Report in *Federal Energy Sales v. AES*, Civil Action 01-420-A, July 13, 2001.

Before the United States District Court for the Western District of Wisconsin, Expert Affidavit on behalf of Alliant Energy Corporation and Wisconsin Power and Light Corporation, Docket No. 00-C-0611-S, February 12, 2002.

Before the United States District Court for the Western District of Wisconsin, Expert Affidavit on behalf of Alliant Energy Corporation and Wisconsin Power and Light Corporation, No. 00-C-0611-S, February 1, 2001.

Before the District Court of Lancaster County, Nebraska, Trial testimony on behalf of KN Energy in KN Energy vs. Cities of Alliance Case Nos. CI 00:1309, CI 00:1310, CI 00:1311, CI 00:1312 (Consolidated), January 22, 2001.

Before the California Superior Court, County of Los Angeles, Deposition testimony on behalf of Tosco Corporation of Tosco Corporation vs. The Los Angeles Water and Power, Case No. BC 215396, January 17, 2001.

Before the District Court of Lancaster County, Nebraska Deposition testimony on behalf of KN Energy in KN Energy vs. Cities of Alliance Case Nos. CI 00:1309, CI 00:1310, CI 00:1311, CI 00:1312 (Consolidated), November 1, 2000.

Before the United States District Court for the Central District of California, Affidavit in the Matter of *United States of America v. Montrose Chemical Corporation of California, et.al.*, Civil Action No. CV 90 3122-R, 21 August 2000.

Before the United States District Court for the Central District of California, Expert Report in the Matter of *United States of America v. Montrose Chemical Corporation of California, et.al.*, Civil Action No. CV 90 3122-AAH (JRx), 15 April 2000.

Before the California Superior Court, County of San Francisco, Deposition testimony on behalf of *Raybestos-Manhattan of Whiteley vs. Raybestos-Manhattan*, Case No. 303184, November 30, 1999.

Before the California Superior Court, County of Los Angeles, Deposition testimony on behalf of F&M Trust of in re The Conservatorship of Leroy and Estelle Strader, September 8-9, 1999.

Before the United States District Court, District of Colorado, Deposition in re *Atlantic Richfield v. Smallwood*, Civil Action No. 95-Z-1767, July 1, 1997.

Before the United States District Court for the Western District of Missouri, Western Division, Expert Rebuttal Affidavit on behalf of Western Resources, Inc., No. 94-0509-CV-W-1, March 8, 1996.

Before the United States District Court for the Western District of Missouri, Western Division, Expert Affidavit on behalf of Western Resources, Inc., No. 94-0509-CV-W-1, June 15, 1995.





- Before the United States District Court for the Central District of California, Affidavit on behalf of Montrose Chemical Corporation of California, et.al., No. CV90-3122-AAH (JRx), March 1, 1995.
- Before the Department of the Interior, Comments re NRDA Regulations, Type B Rule, September 22, 1993.
- Before the National Oceanic and Atmospheric Administration, Comments on the Advance Notice of Proposed Rulemaking (57 Federal Register 8964) of Natural Resource Damage Assessment Regulations (Oil Pollution Act, Section 1006), October 1, 1992.
- Before The United States District Court for the District of Utah. Testimony on behalf of Kennecott Corporation, Docket No. 86-C-902C, March 26, 1992.
- Before the American Arbitration Association, Testimony on behalf of Hard Rock Cafe International, January 22, 1992.
- G&H Landfill. Prepared analysis of the statistical effect of landfill location and neighborhood property values (early 1990s).
- Before the Superior Court of California, Orange County, Expert Report re economic and stigma analysis related to environmental damages related to groundwater contamination in *Bouchier v. MacHoward Leasing (Honda)* (early 1990s).
- State of Washington v. Nestucca* (Sause Brothers). Prepared an economic analysis of sea bird losses related to an oil spill in the Pacific Ocean off the coast of Washington (early 1990s).
- Before the Department of Interior, Comments on Notice of Proposed Rulemaking for Natural Resource Damage Assessment Regulations, Type B Rule (43 CFR Part 11), July 12, 1991.
- Before the Massachusetts Appellate Tax Board, Analysis of the Fair Market Value of Boston Edison's Mystic Generating Station, Prepared for Boston Edison Company, December 10, 1990.
- Before the U.S. Department of Interior, Comments on the U.S. Department of Interior's Advanced Notice of Proposed Rulemaking re: Natural Resource Damage Assessments (43 CFR Part 11), November 13, 1989.
- Before the Senate Committee on Energy and Natural Resources, Prepared Statement related to the Demand-Side Provisions of the Public Utility Regulatory Policies Act of 1978 (PURPA) Contained in Subtitle B of Title III of S-324, The National Energy Policy Act of 1989, November 7, 1989
- U.S. v. Motorola*. Prepared statistical analyses of property values and ground water for Phoenix metropolitan area (early 1990s).
- Before the United States District Court, State of Colorado, Expert Damages Report in *State of Colorado v. Gulf & Western*, December 2, 1985.
- French Limited. Prepared analysis of environmental damages (late 1980s).
- Commonwealth of Massachusetts v. Charles George Trucking Company*. Prepared a damages analysis for environmental damages (late 1980s)



*U.S. v. Aerovox (New Bedford Harbor)*. Prepared numerous economic damage calculations, conducted surveys, and analyzed property data for several different clients in the late 1980s.

Before the House Subcommittee on Energy Conservation and Power of the Committee on Energy and Commerce, Comments on Hydroelectric Relicensing, June 5, 1985

Before the Department of Health and Social Services, Testimony on behalf of Madison General Hospital, In *Application for Certificate of Need for Open Heart Surgery*, CON 82-026, November, 1982. (Antitrust)

Before the Senate Committee on Energy and Natural Resources, Prepared Statement related to the Implementation of Title I of the Natural Gas Policy Act of 1978, November 5 and 6, 1981.

Before the Postal Rate Commission, Testimony on behalf of the National Association of Greeting Card Publishers, Docket No. R80-1, August 13, 1980.

Before the House Ways and Means Committee, Washington, D.C., Testimony on Utility Tax Reform, March 8, 1978.

Before the Senate Subcommittee on Energy Conservation and Regulation of the Senate Committee on Energy and Natural Resources, Comments on Utility Tax Reform, July, 1977.

Before the Subcommittee on Energy and Power of the U.S. House of Representatives Interstate and Foreign Commerce, comment with respect to Synthetic Fuel Loans, May, 1976.

Prepared comments on "H.R. 12461, Summary of Major Provisions of Electric Utility Rate Reform and Regulatory Improvement Act (formerly H.R. 10100), March, 1976.

Before the Subcommittee on Energy and Power of the U.S. House of Representatives Interstate and Foreign Commerce, Comments with respect to Electric Utility Reform, March, 1976.

Before the Senate and House Interior Committees, comments on Trans-Alaska Pipeline; Energy Conservation and Pricing; and the Optimum Transportation System for Alaskan Natural Gas, March, 1976

Before the Federal Energy Administration, "Amendments of Entitlements Program," February, 1976.

Before the Wisconsin State Legislature, Environmental Quality Commission Testimony, January, 1976.

Before the Department of Energy, Mines and Resources, Testimony on behalf of the office of Energy Conservation, May 16, 1977.

Before the U.S. Senate Committee on Interstate and Foreign Commerce, Subcommittee on Energy and Power, Testimony, May 25, 1976.

Before the Wisconsin State Legislature, Testimony on the Governor's transportation Program before the Senate Committee on commerce, Joint Committee on Highways, 1975.

Before the Senate Interior Committee re Energy Transportation, Testimony, December 12, 1973.

Before the Senate Sub-Committee on Consumer Economics, Testimony re Electricity Pricing, October 25, 1975.



Before the U.S. Senate Committee on Interior and Insular, Testimony re the Trans Alaska Pipeline, May 3, 1973.

Before the U.S. Senate Committee on Interior and Insular Affairs, Comments re the Role of Energy Conservation in National Energy Policy, March 22, 1973.

Before the Joint Economic Committee, Testimony Concerning the Relative Economic Merits of the Proposed Trans Alaska Pipeline, June 9, 1972.

*State of Florida v. U.S. Army Corps of Engineers.* Prepared an economic analysis for the State of Florida related to damages on the Kissimmee River related to stream channelization (mid 1970s).

*U.S. Forest Service v. Disney.* Prepared an economic analysis of preservation versus development of Mineral King Ski development (early 1970s).

Before the US Senate Commerce Committee, comments with respect to Natural Gas De-Regulation.

Before the Subcommittee on Energy and Power of the U.S. House of Representatives Interstate and Foreign Commerce, Comments with respect to Energy and Power, Electricity and Natural Gas Utility Policy.

Before the Subcommittee on Energy and Power of the U.S. House of Representatives Interstate and Foreign Commerce, comment with respect to Electricity and Natural Gas Utility Policy.

Before the Department of the Interior, Comments with respect to the Trans-Alaska Pipeline.

Before the New York and New Jersey Environmental Protection Agencies and Civil Proceedings, Testimony With Respect to Tocks Island Dam and Delaware River Development.

Before the Energy Council of the Federal Government, Critique of the Project Independence Report and Critique of Oil and Natural Gas Policy.

Before the Joint Economic Committee, Testimony on the Trans Alaska Pipeline, Mandatory Oil Import Quotas, Hells Canyon, Energy Policy, and Electricity Pricing.

Before the Florida Federal Courts on Kissimmee River Channelization.

Before Tennessee Federal Courts on Tennessee Tombigbee River Development.

## **REGULATORY PROCEEDINGS AND RELATED LEGISLATIVE TESTIMONY**

Before the Alberta Utility Commission, Written Supplemental Evidence on behalf of Trans Alta Utilities in the matter of Recovering Decommissioning Costs for Deferred Actions, March 2020.

Before the Public Utility Commission of Colorado, Written Evidence on behalf of Tri-State G&T related to United Power and La Plata Electric's membership contract abrogation, February 2020.

Before the Public Service Commission of Wisconsin, 2019, testimony related to assigning costs related to the Milwaukee Metropolitan Sewerage District's renewable energy generating capacity.



- Before the Public Utility Commission of Colorado, Written Evidence on behalf of Tri-State G&T related to Delta-Montrose Electric Association's membership contract abrogation, April 2019.
- Before the Alberta Utility Commission, Written Evidence on behalf of Trans Alta Utilities in the matter of Recovering Decommissioning Costs for Deferred Actions, December 2018.
- Before the California Public Utilities Commission, Rebuttal Testimony on Behalf of Avalon Freight Services, Application Numbers 14-10-105 and 15-01-005, April 16, 2018.
- Before the California Public Utilities Commission, Direct Testimony on Behalf of Avalon Freight Services, Application Numbers 14-10-105 and 15-01-005, March 25, 2018.
- Before the Alberta Utilities Commission, Rebuttal Evidence on Behalf of Direct Energy Regulated Services (DERS) Application for a Retail Margin, February 9, 2018.
- Before the New York Public Service Commission, Direct Testimony on Behalf of National Energy Marketers Association (NEM), Cases 15-M-0127, 12-M-0476, and 98-M-1343, September 15, 2017.
- Before the Nevada Public Utilities Commission, Direct Testimony in Support of MGM Resorts International in Nevada Power Company d/b/a NV Energy's 2017 General Rate Case, Cost of Capital Phase, Docket No. 17-06003, September 12, 2017.
- Settlement in Application of MGM Resorts International to Purchase Energy, Capacity, and Ancillary Services From a Provider of New Electric Resources, Docket No. 15-05017, June 14, 2017.
- Before the Alberta Utilities Commission, Evidence in Support of Direct Energy Regulated Services (DERS) Application for a Retail Margin, September 2016.
- Before the Federal Energy Regulatory Commission, Affidavit on Behalf of Algonquin Gas Transmission, LLC. *NextEra Energy Resources, LLC, PSEG Companies v. ISO New England, Inc.*, Docket No EL16-93-000, July 28, 2016.
- Before the Arizona Corporation Commission, Responsive Testimony on Behalf of the Energy Freedom Coalition of America (EFCA) In the Matter of Tucson Electric Power Company for Approval of its 2016 Renewable Energy Standard and Tariff Implementation, Docket No. E-01933A-15-0239, March 28, 2016.
- Before the Arizona Corporation Commission, Testimony on Behalf of the Energy Freedom Coalition of America (EFCA) In the Matter of Tucson Electric Power Company for Approval of its 2016 Renewable Energy Standard and Tariff Implementation, Docket No. E-01933A-15-0239, March 11, 2016.
- Before the National Energy Board, Written Evidence on Behalf of Westcoast Energy Inc., Carrying on Business as Spectra Energy Transmission, in the Matter of Nova Gas Transmission Ltd. Application for the Towerbirch Expansion Project, Hearing Order GH-003-2015, March 8, 2016.
- Before the California Public Utilities Commission, Testimony on behalf of ChargePoint, Inc. in re Application of Pacific Gas & Electric for Approval of its Electric Vehicle Infrastructure and Education Program, Docket No. A.15-02-009, November 30, 2015.



Before the Public Utilities Commission of Nevada, Testimony on behalf of the Alliance for Solar Choice in re Application of Nevada Power Company, Docket No. 15-07041, August 20, 2015.

Before the Pennsylvania Public Utility Commission, In re: *Pennsylvania Public Utility Commission Bureau of Investigation and Enforcement v. HIKO Energy, LLC*, Direct Testimony, Docket No. C-2014-2431410, March 13, 2015.

Before the Public Service Commission of Wisconsin, In re: Joint Application of Wisconsin Electric Power Company and Wisconsin Gas LLC, both d/b/a We Energies, for Authority to Adjust Electric, Natural Gas, and Steam Rates, Surrebuttal Testimony, on behalf of the Milwaukee Metropolitan Sewerage District, Case No. 05-UR. 107, September 22, 2014.

Before the Public Service Commission of Wisconsin, In re: Joint Application of Wisconsin Electric Power Company and Wisconsin Gas LLC, both d/b/a We Energies, for Authority to Adjust Electric Natural Gas, and Steam Rates, Rebuttal Testimony on behalf of the Milwaukee Metropolitan Sewerage District, 05-UR,107, September 12, 2014.

Before the National Energy Board, In re: Application for Approval of Mainline 2013-2030 Settlement, Additional Written on Behalf of Centra Gas Manitoba, T211-2013-05-01, September 3, 2014.

Before the National Energy Board, In the Matter of Trans Mountain Pipeline ULC, Application for Tariff Amendments Regarding Verification Procedures, Public Written Reply Evidence on Behalf of Phillips 66, Hearing Order RHW-001-2013, August 8, 2014.

Before the National Energy Board, Nova Gas Transmission LTD. Application for the North Montney Project, Written Evidence on Behalf of Westcoast Energy Inc., Carrying on Business as Spectra Energy Transmission, Hearing Order GH-001-2014, July 10, 2014.

Before the National Energy Board, T211-2013-05-01, Application for Approval of Mainline 2013-2030 Settlement, Written Evidence on Behalf of Centra Gas Manitoba, July 4, 2014.

Before the Regulatory Commission of Alaska, Prepared Answering Testimony on Behalf of Cook Inlet Energy, LLC and Aurora Gas, LLC, In the Matter of the Tariff Revisions Designated as TA 252-4 and TA 253-4 Filed by ENSTAR Natural Gas Company, a Division of SEMCO Energy, Inc., U-14-010, May 5, 2014.

Before the State Assessment Review Board (SARB) State of Alaska, Expert Report on the valuation of the Trans Alaska Pipeline System (TAPS) on behalf of various municipalities; May 2014.

Before the National Energy Board, Public Written Direct Evidence on behalf of Phillips 66 in the Matter of Trans Mountain Pipeline ULC Application for Tariff Amendments Regarding Verification Procedures, April 22, 2014.

Before the Minnesota Public Utilities Commission, Rebuttal Testimony on Behalf of Enbridge Energy, Limited Partnership, Docket No. PL-9/CN 13-153, OAH Docket No. 8-2500-30952, March 13, 2014.

Before the Regulatory Commission of Alaska, Prepared Testimony in the Matter of the Application Filed by Fairbanks Natural Gas, LLC to Amend Certificate of Public Convenience and Necessity No. 514 to Expand its Service Area and in the Matter of Application Filed by Interior Alaska Natural Gas Utility for a Certificate



of Public Convenience and Necessity to Operate as a Natural Gas Utility in Areas of the Fairbanks North Star Borough, RCA Docket Nos. U-13-083/U-13-103, September 9, 2013.

Before the Alberta Handling Commission, Written report of Memoranda in re Retail Margins (Handling Fee) for the Alberta Bottle Depots August 29, 2013.

Before the Illinois Commerce Commission, Testimony in re Enbridge Pipelines (FSP) L.L.C., Docket No. 12-0347, July 3, 2012.

Before the Federal Energy Regulatory Commission and the Regulatory Commission of Alaska, Prepared Supplemental Reply Testimony., On Behalf of Anadarko Petroleum Corporation and Tesoro Alaska Company, Phase II Cost of Service-FERC/RCA Concurrent Hearing, Docket No. IS09-348-006, et al., June, 19, 2012.

Before the National Energy Board, Written Evidence on Behalf of Westcoast Energy, Case No. GH-001-2012, May 29, 2012.

Before the Federal Energy Regulatory Commission and the Regulatory Commission of Alaska, Prepared Supplemental Testimony. on Behalf of Anadarko Petroleum Corporation and Tesoro Alaska Company, Phase II Cost of Service-FERC/RCA Concurrent Hearing, May 4, 2012.

Before the Alberta Utility Commission, Written Evidence on behalf of EPCOR Distribution and Transmission Inc., Performance Based Ratemaking Proceeding, Appendix C, Application No. \_\_\_; Proceeding \_\_\_; July 22, 2011.

Expert Report in Support of the Formation of the Energy Interchange Natural Gas Network Hub in Central Louisiana, on behalf of Energy Interchange Joint Application for Certificates of Public Convenience and Necessity, Abandonment Authority, and for Authority to Offer New Market Based Rates; Docket No. CP11-\_\_\_; June 2011.

Before the Alberta Handling Commission, on behalf of the Beverage Container Management Board re Appropriate Margin; November 9, 2010.

Before the Alberta Utility Commission, Written Evidence on behalf of ATCO Gas 2011-2012 General rate application, Section 4.4 Appendix A, November 8, 2010.

Before the Federal Energy Regulatory Commission, Comments re Supplemental Notice of Proposed Rulemaking and Notice of Technical Conference, Docket RM10-17-000, August 25, 2010.

Before the Federal Energy Regulatory Commission, Prepared Testimony on Behalf of Puget Sound Energy's Proposed amendment to its Open Access Transmission Tariff to add Schedule 12, Wind Integration-Within Hour Generation Following Service; Docket No. ER10-\_\_\_000, June 14, 2010.

Before the Federal Energy Regulatory Commission, Comments on behalf of PJM Interconnection, LLC in re Demand Response Compensation in Organized Wholesale Energy Markets, Docket RM 10-17-00, April 27, 2010.





Before the Alberta Utility Commission, Written Evidence on behalf of EPCOR Distribution and Transmission Inc., in re 2010-2011 Phase I Distribution Tariff and 2010-2011 Transmission Facility Owner Tariff, Appendix G-10, December 22, 2009.

Retail Margin Evidence on behalf of EPCOR Energy Alberta Inc., in re: 2010-2011 Regulated Tariff Application, AppendixE-5, December 22, 2009.

Before the Alberta Utilities Commission, Written Rebuttal Evidence for EPCOR Energy Alberta, Inc., Review Hearing on the AEUB Decision 2008-031, 2007-2009 Regulated Rate Tariff Non-Energy Return, Application No. 1577836 Proceeding Id. 174, September 28, 2009.

Before the Public Utilities Commission of the State of California, Supplemental Rebuttal Testimony on Behalf of the Navajo Nation, In re: Application of Southern California Edison Company Regarding the Distribution of SO2 Allowance Sales Proceeds Related to the Suspended Operation of Mohave Generating Station, Application 06-12-022, August 19, 2009.

Before the Alberta Utilities Commission, Rebuttal Testimony in Support of AltaLink Management LTD 2009-2010 General Tariff Application, April 16, 2009.

Before the Alberta Utilities Commission, Written Evidence In Support of EPCOR Energy Alberta Inc. Review Hearing on AEUB Decision 2008-031 2007-2009 Regulated Rate Tariff (RRT) Non-Energy Return, Appendix T, Application No. 1577836, Proceeding ID 174, April 9, 2009.

Before the Alberta Utilities Commission, Rebuttal Evidence on Behalf of ATCO Electric, Application No. 1578371, February 4, 2009.

Before the Alberta Utilities Commission, Testimony in Support of AltaLink Management LTD 2009-2010 General, Tariff Application, September 16, 2008.

Before the Public Utilities Commission of the State of California, Rebuttal Testimony. on Behalf of the Navajo Nation, in re Application of Southern California Edison Company (U 338-E) Regarding the Distribution of SO2 Allowance Sale Proceeds Related to the Suspended Operation of Mohave Generating Station, Application 06-12-022, August 1, 2008

Before the Public Utilities Commission of the State of California, Direct Testimony on Behalf of the Navajo Nation, in re Application of Southern California Edison Company (U 338-E) Regarding the Distribution of SO2 Allowance Sale Proceeds Related to the Suspended Operation of Mohave Generating Station, Application 06-12-022, August 1, 2008.

Before the North Carolina Utilities Commission, Rebuttal Testimony for Duke Energy Carolinas, In re: Application of Duke Energy Carolinas, LLC for Approval of Save-a-Watt Approach, Energy Efficiency Rider, and Portfolio of Energy Efficiency Programs, Docket No. E-7, SUB 831, July 21, 2008

Before the Nebraska Public Service Commission, Prefiled Direct Testimony On Behalf of SourceGas Distribution, LLC and Kinder Morgan, Inc., Docket No. FC-1327, July 9, 2008.

Before the Alberta Utility Commission, Direct Evidence on Behalf of ATCO Electric, Application No. 1578371, July 4, 2008.





- Before the Indiana Utility Regulatory Commission, Rebuttal Testimony on related to energy efficiency on Behalf of Duke Energy Indiana, Inc. Case No. 43373, July 2, 2008.
- Before the Arizona Corporation Commission, Affidavit in Support of Arizona Public Service Company's Motion for Interim Rate, Docket No. E-01345A008-0172, June 4, 2008.
- Before the Illinois Commerce Commission, Sur-rebuttal, on Behalf of Enbridge Pipelines (Illinois) LLC, Docket No. 07-0446, May 21, 2008.
- Before the North Carolina Utilities Commission, Direct Testimony in re Application of Duke Energy Carolinas, LLC for Approval of Save-a-Watt Approach, Energy Efficiency Rider, and Portfolio of Energy Efficiency Programs, Docket No. E-7, SUB 831, April 3, 2008.
- Before the Illinois Commerce Commission, Reply Testimony on Behalf of Enbridge Pipelines (Illinois) LLC, Docket No. 07-0446, February 4, 2008.
- Before the Public Service Commission of South Carolina, Rebuttal Testimony for Duke Energy Carolinas, In re: Application of Duke Energy Carolinas, LLC For Approval of Energy Efficiency Plan Including Energy Efficiency Rider and Portfolio of Energy Efficiency Programs, January 2008.
- Before the Public Utility Commission of Oregon, Declaration (with Jeffrey A. Dubin) in Response to Wah Chang's Renewed, Supplemental and Alternative Motions to Compel Compliance with DR 203, In *Wah Chang v PacifiCorp*, UM 1002, November 19, 2007.
- Before the Public Utility Commission of Oregon, Declaration in Support of PacifiCorp's Post Hearing Brief, In *Wah Chang v. PacifiCorp*, UM 1002, November 12, 2007.
- Before the Illinois Commerce Commission, Testimony on Behalf of Enbridge Pipelines (Illinois) LLC, Docket No. 07-0446, October 5, 2007.
- Before the Public Utility Commission for the State of Oregon, Supplemental Reply Testimony (with Jeffrey A. Dubin, Ph.D.) In *Wah Chang v. PacifiCorp*, Docket No. UM 1002, July 31, 2007.
- Before the Oregon Public Utility Commission, Deposition in *Wah Chang v. PacifiCorp*, UM 1002, June 14, 2007.
- Before the Oregon Public Utility Commission, Reply Testimony In *Wah Chang v. PacifiCorp*, UM 1002, May 24, 2007.
- Before the Illinois Commerce Commission, Expert Testimony of On Behalf of Enbridge Energy Partners, L.P. and Enbridge Energy, Limited Partnership, Docket No. 06-0470, December 21, 2006.
- Before the Alberta Energy and Utility Board, Expert Testimony on behalf of DERS and ENMAX In Support of The Direct Energy Regulated Services Default Rate Tariff and Regulated Rate Tariff Application in 2007 and 2008, December 15, 2006.
- Before the Alberta Handling Commission, Written report Memoranda in re Retail Margins (Handling Fee) for the Alberta Bottle Depots September 19, 2006.



- Before the Alberta Utility Board, Rebuttal Evidence on Behalf of DERS re Application for Approval of Regulated Rate Tariff (RRT), August 11, 2006.
- Before the Alberta Utility Board, Rebuttal Evidence on Behalf of ENMAX re Application for Approval of Regulated Rate Tariff (RRT), August 11, 2006.
- Before the Alberta Energy and Utility Board, Expert Testimony In Support of The Enmax Energy Corporation Application for Approval of a Regulated Rate Tariff (RRT) to take effect July 1, 2006, Pursuant to Section 103 of the Electric Utilities Act and Section 23 of the Regulated Rate Option Regulation, April 4, 2006.
- Before the Alberta Energy and Utility Board, Expert Testimony In Support of The Direct Energy Regulated Services Application for Approval of a Regulated Rate Tariff (RRT) to take effect July 1, 2006, Pursuant to Section 103 of the Electric Utilities Act and Section 26 of the Regulated Rate Option Regulation, March 21, 2006.
- Before the FERC, Prepared Reply Testimony on behalf of Idacorp Energy L.P. and Idaho Power Company, Docket No. EL00-95-147, EL00-98-134, October 17, 2005.
- Before the FERC, Prepared Reply Testimony of on behalf of Avista Energy Inc., Docket No. EL 00-95-000, EL00-98-000, November 7, 2005.
- Before the FERC, Prepared Supplemental Testimony on behalf of Avista Energy Inc., Docket No. EL00-95-000, EL00-98-000, September 30, 2005.
- Before the FERC, Prepared Testimony on behalf of Idacorp Energy L.P. and Idaho Power Company, Docket No. EL00-95-000, EL00-98-000, September 14, 2005.
- Before the FERC, Prepared Testimony on behalf of Avista Energy Inc., Docket No. EL00-95-000, EL00-98-000, September 14, 2005.
- Before the Florida Public Service Commission, Rebuttal Testimony on behalf of Progress Energy Florida, Docket No. 050078-EI, August 5, 2005.
- Before the Florida Public Service Commission, Direct Testimony o on behalf of Progress Energy Florida, Review of Progress Energy Florida's Rate Case Filing, Docket No. 050078, April 29, 2005.
- Before the FERC, on Behalf of Pepco Holdings, Inc. in Docket No. EC05-43-000, April 11, 2005.
- Before the FERC, Affidavit to Comment on Order Granting Motion and Requesting Comments in *San Diego Gas & Electric Company v. Sellers Of Energy and Ancillary Service Into Markets Operated by the California Independent System Operator Corporation And the California Power Exchange*, Docket No. EL00-95-045, EL00-98-042, January 10, 2005.
- Before the Washington Utilities and Transportation Commission, Prefiled Rebuttal Testimony on behalf of Puget Sound Energy, Inc., Docket No. UE-04/UG-04, November 2004.
- Before the National Energy Board, Direct Evidence In the Matter of TransCanada Pipelines, RH-3-2004, June 21, 2004.



- Before the California Public Utilities Commission, Rebuttal Testimony on behalf of The Navajo Nation, Application No. 02-05-046, June 4, 2004.
- Before the California Public Utilities Commission, Superseding Testimony on behalf of The Navajo Nation, Application No. 02-05-046, May 14, 2004.
- Before the California Public Utilities Commission, Reply Testimony on behalf of Cal-CLERA, Docket No. R03-10-003, May 7, 2004.
- Before the California Public Utilities Commission, Prepared Testimony on behalf of Cal-CLERA and the City of Victorville, Docket No. R03-10-003, April 15, 2004.
- Before the Washington Utilities and Transportation Commission, Prefiled Direct Testimony on behalf of Puget Sound Energy, Inc., Docket No. UE-04/UG-04, April 5, 2004.
- Before the FERC, Affidavit for the Independent Energy Producers, on Behalf of Mountainview Power, January 8, 2004.
- On Behalf of VENCORP (Australia), Final Report on Stage 1 Definition of Market Design Packages, December 24, 2003.
- On Behalf of VENCORP (Australia), Initial Report on Stage 1 Definition of Market Design Packages, December 8, 2003.
- Before the Public Utilities Commission of the State of California, Prepared Rebuttal Testimony on behalf of The Navajo Nation, Application No. 02-05-046, October 29, 2003.
- Before the Public Utilities Commission of the State of California, Comments on behalf of The California Clean Energy Resources Authority (Cal-CLERA), October 22, 2003.
- Before the Public Utilities Commission of California, Prepared Direct Testimony on behalf of The Navajo Nation, Application No. 02-5-046, October 10, 2003.
- Before the Public Utilities Commission of California, Prepared Rebuttal Testimony on behalf of the Independent Energy Producers Association, Docket No. A-03-03-032, October 6, 2003.
- Before the California Public Utilities Commission, Prepared Direct Testimony on behalf of the Independent Energy Producers Association (IEP), Docket No. A.03-07-032, September 29, 2003.
- Before the FERC, Testimony on behalf of BP Energy, Docket No. EL03-60-000, April 16, 2003.
- Before the FERC, Testimony on behalf of Idacorp Energy L.P. and Idaho Power Company, Docket No. EL01-10-007, March 20, 2003.
- Before the FERC, Testimony on Behalf of Avista Energy, Inc., BP Energy Company, Idacorp Energy L.P., Puget Sound Energy Inc., TransAlta Energy Marketing (U.S.) Inc., TransAlta Energy Marketing (California) Inc., and TransCanada Energy, Ltd., Docket No. EL00-95-075, EL00-98-063, March 3, 2003.



Before the FERC, Affidavit to Comment on FERC Staff's Recommendations Related to Natural Gas Prices in California's Electric Markets During the Refund Period, Docket No. EL00-95-045, EL00-98-042, October 14, 2002.

Before the FERC, Prepared Reply Testimony on Behalf of Avista and Accompanying Exhibits, Docket No. EL00-95-045, EL00-98-042, August 9, 2002.

Before the FERC, Prepared Rebuttal Testimony Issues II and III, Docket No. EL00-95-045, EL00-98-042, July 26, 2002.

Before the FERC, Prepared Responsive Testimony Issues II and III, Docket No. EL00-95-045, EL00-98-042, July 3, 2002.

Before the US House of Representatives Subcommittee on Energy Policy, Natural Resources and Regulatory Affairs, Comments in the Matter of "California's Electricity Markets: The Case of Enron and Perot Systems," on behalf of Perot Systems Corporation, July 22, 2002.

Before the Arizona Corporation Commission, Supplemental Testimony on behalf of Arizona Public Service Company, Docket No. E-00000A-02-0051m June 26, 2002.

Before the Arizona Corporation Commission, Rebuttal Testimony on behalf of Arizona Public Service Company, Docket No. E-00000A-02-0051, et al., June 11, 2002.

Before the Alberta Energy and Utilities Board, In the Matter of an Application by NOVA Gas Transmission Ltd. For Fort Saskatchewan Extension & Scotford Sales Meter Station & Josephburg Sales Meter Station & Astotin Sales Meter Station, Supplemental Evidence May 7, 2002.

Before the Arizona Corporation Commission, Rebuttal Testimony on behalf of Arizona Public Service Company, Docket No. E-01345A-01-0822, April 22, 2002.

Before the Alberta Energy Board, Evidence In the Matter of An Application by NOVA Gas Transmission Ltd. for Fort Saskatchewan Extension & Scotford Sales Meter Station & Josephburg Sales Meter Station & Astotin Sales Meter Station March 26, 2002.

Before the Florida Public Service Commission, Rebuttal Testimony on behalf of Florida Power Corporation, Docket No. 000824-EI, February 11, 2002.

Before the Federal Energy Regulatory Commission, Prepared Supplemental Testimony on behalf of Avista Energy Inc., BP Energy Company, Coral Power, LLC, IDACORP Energy, LP, Puget Sound Energy and Semptra Energy Trading Corp (Competitive Supplier Group), Docket No. EL00-95-045 – EL00-98-042, January 31, 2002.

Before the Federal Energy Regulatory Commission Deposition testimony on behalf of Competitive Suppliers Group, Docket Nos. EL00-95-045 and EL00-98-042, November 28, 2001. (FERC)

Before the Federal Energy Regulatory Commission, Issue I. Prepared Testimony., on behalf of the Competitive Suppliers Group (Cal Refund), Docket No. EL00-95-045 – EL00-98-042, November 6, 2001.



Before the Florida Public Service Commission, Direct Testimony on behalf of Florida Power Corporation, Docket No. 000824-EI, September 14, 2001.

Before the Federal Energy Regulatory Commission, prepared Direct Testimony and Exhibits on behalf of Idacorp Energy, L.P., Docket Nos. EL01-10-000 and EL01-10-001, August 27, 2001.

Before the State Corporation Commission of the State of Kansas, Rebuttal Testimony on behalf of Western Resources, Inc., Docket No. 01-WRSE-949-GIE, June 2001.

Before the State Corporation Commission of the State of Kansas, Direct Testimony on behalf of Western Resources, Inc., Docket No. 01-WRSE-949-GIE, June 2001.

Before the California Energy Commission, Statement and Affidavit re the Baldwin Energy Facility, June 2001.

Before the State Corporation Commission of the State of Kansas, Surrebuttal Testimony on behalf of Western Resources, Inc., Docket No. 01-WRSE-436-RTS, May 2001.

Before the State Corporation Commission of the State of Kansas, Rebuttal Testimony on behalf of Western Resources, Inc., Docket No. 01-WRSE-436-RTS, April 2001.

Before the State Corporation Commission of the State of Kansas, Direct Testimony on behalf of Western Resources, Inc., Docket No. 01-WRSE-436-RTS, January 2001.

Before the Federal Energy Regulatory Commission, Affidavit on behalf of Entergy Power Marketing Corp. and Koch Energy Trading, Inc., Docket No. EC00-106, 20 June 2000.

Before the Federal Energy Regulatory Commission, Affidavit on behalf of Western Resources, Inc., Docket No. ER00-00-000, 28 April 2000.

Before the Public Service Commission of Florida, Intervenor Testimony on behalf of Florida Power Corporation, Docket No. 991462, 7 March 2000.

Before the Public Service Commission of Wisconsin, Direct Testimony on behalf of ANR Pipeline Company, Docket No. 6650-CG-194, 6 March 2000.

Before the Federal Energy Regulatory Commission, Rebuttal Testimony on behalf of Duke Energy South Bay, LLC, Docket Nos. ER98-496-000 and ER98-2160-000, 1 March 2000.

Before the Federal Energy Regulatory Commission, Affidavit on behalf of ANR Pipeline Company, Docket Nos. CP00-36-000, CP00-37-000, and CP00-38-000, 28 December 1999.

Before the Federal Energy Regulatory Commission, Direct Testimony on behalf of Duke Energy South Bay, LLC, Docket Nos. ER98-496-000 and ER98-2160-000, 22 December 1999.

Before the Public Service Commission of Wisconsin, Rebuttal Testimony on behalf of Alliant Energy Corporation, Docket Nos. 9403-YI-100 and 6680-UM-100, 23 September 1999.

Before the Public Service Commission of Wisconsin, Direct Testimony on behalf of Alliant Energy Corporation, Docket Nos. 9403-YI-100 and 6680-UM-100, 1 July 1999.



- Before the Public Service Commission of the State of Missouri, Surrebuttal Testimony on behalf of Western Resources, Inc. and Kansas City Power & Light, Case No. EM-97-515, 10 June 1999.
- Before the State Corporation Commission of the State of Kansas, Rebuttal Testimony on behalf of Western Resources, Inc., Docket No. 97-WSRE-676-MER, 18 March 1999.
- Before the Federal Energy Regulatory Commission, Affidavit on behalf of Duke Energy South Bay LLC, Docket No. ER98-496-000 and ER98-2160-000, February 1999.
- Before the Georgia Public Service Commission, Rebuttal Testimony on behalf of Georgia Power Company, GPSC Docket No. 9355-U, 27 October 1998.
- Before the Public Service Commission of the State of Missouri, Direct Testimony on behalf of Western Resources, Inc. and Kansas City Power & Light Company, Case No. EM-97-515, Vol. III, June 1998.
- Before the State Corporation Commission of the State of Kansas, Direct Testimony on behalf of Western Resources, Inc., Docket No. 97-WSRE-676-MER, 17 June 1998.
- Before the Georgia Public Service Commission, Direct Testimony on behalf of Georgia Power Company, GPSC Docket No. 9355-U, 3 June 1998.
- Before the Federal Energy Regulatory Commission, Direct Testimony on behalf of Duke Energy, Docket No. ER98-496-000 and ER98-2160-000 24 April 1998.
- Before the Public Service Commission of Wisconsin, Surrebuttal Testimony on behalf of Wisconsin Electric Power Company, Docket No. 05-BE-100, \_\_\_ March 1998.
- Before the Public Service Commission of Wisconsin, Rebuttal Testimony on behalf of Wisconsin Electric Power Company, Docket No. 05-BE-100, 23 March 1998.
- Before the Public Service Commission of Wisconsin, Testimony on behalf of Wisconsin Electric Power Company, Docket No. 05-BE-100, 9 March 1998.
- Before the Pennsylvania Public Utilities Commission, Rebuttal Testimony on behalf of Pennsylvania Power Company, Docket No. R-00974149, 19 February 1998.
- Before the State Corporation Commission of Kansas, Prepared Statement on behalf of Western Resources, Inc., 28 October 1997
- Before the Federal Energy Regulatory Commission, Testimony on behalf of Wisconsin Energy Corporation and ESELCO, Inc., Docket No. EC97-\_\_\_-000, 22 October 1997.
- Before the Pennsylvania Public Utilities Commission, Direct Testimony on behalf of Pennsylvania Power Company, Docket No. R-00974149, 26 September 1997.
- Before the Public Utilities Commission of the State of California, Testimony on behalf of Southern California Edison Company, Docket No. U-338-E, September 15, 1997.





- Before the Federal Energy Regulatory Commission, Affidavit on behalf of The Power Company of America, L.P., Docket No. ER95-111-000, November 1, 1996.
- Before the Public Service Commission of Wisconsin, Rebuttal Testimony on behalf of Wisconsin Energy Corporation, Wisconsin Electric Power Company, *et.al.* (Applicants), Docket Nos. 6630-UM-100, 4220-UM-101, October 23, 1996.
- Before the Public Utilities Commission of the State of California, Rebuttal Testimony on behalf of Pacific Telesis Group, No. 96-04-038, October 15, 1996.
- Before the Commonwealth of Massachusetts Department of Public Utilities, Rebuttal Testimony on behalf of Boston Gas Company, Docket No. D.P.U. 96-50, Exhibit BGC-117, August 16, 1996.
- Before the State Corporation Commission of the State of Kansas, Revised Direct Testimony on behalf of Western Resources, Inc. and Kansas Gas and Electric, Docket Nos. 193,306-U and 193,307-U, July 11, 1996.
- Before the Federal Energy Regulatory Commission, Prepared Rebuttal Testimony on behalf of Koch Gateway, Docket No. RP95-362-000, June 18, 1996.
- Before the Federal Energy Regulatory Commission, Rebuttal Testimony on behalf of Wisconsin Electric Power Company, Northern States Power Company (Minnesota and Wisconsin), and Cenerprise, Docket Nos. EC95-16-000, ER95-1357-000, and ER95-1358-000, May 28, 1996.
- Before the Arkansas Public Service Commission, Rebuttal Testimony on behalf of Arkansas Power & Light, Docket No. 89\_128 U, 1996.
- Before the New Mexico Public Utility Commission, Direct Testimony on behalf of Southwestern Public Service Company, Case No. \_\_\_\_\_, November 1995.
- Before the State Corporation Commission of the State of Kansas, Direct Testimony on behalf of Kansas Gas and Electric Company, August 11, 1995.
- Before the Federal Energy Regulatory Commission, Direct Testimony on behalf of Koch Gateway Pipeline Company, Docket No. RP-95- -000, June 28, 1995.
- Before the National Energy Board of Canada, Evidence in the Matter of Fort St. John and Grizzly Valley Expansion Projects, British Columbia Gas, January 1995.
- Before the Federal Energy Regulatory Commission, Rebuttal Comments in the Matter of Pricing Policy for New and Existing Facilities Constructed by Interstate Natural Gas Pipelines on behalf of Cascade Natural Gas Corporation, *et.al.* Docket No. PL94-4-000, December 5, 1994.
- Before the Federal Energy Regulatory Commission, Comments Related to Pricing Policy for New and Existing Facilities Constructed by Interstate Natural Gas Pipelines on behalf of Cascade Natural Gas Corporation, LFC Gas Company, Northwest Natural Gas Company, and Washington Natural Gas Company, Docket No. PL94-4-000, November 4, 1994.
- Affidavit on behalf of Barr Devlin, October 1994. (FERC)





Before the Federal Energy Regulatory Commission, Comments and Responses Related to Pricing Policy for New and Existing Facilities Constructed by Interstate Natural Gas Pipelines on behalf of Cascade Natural Gas Corporation, LFC Gas Company, Northwest Natural Gas Company, and Washington Natural Gas Company, Docket No. PL94-4-000, September 26, 1994.

Before the Federal Energy Regulatory Commission, Statement on behalf of Buckeye Pipe Line Company, L.P., Docket Nos. OR94-6-000 and IS87-14-000, February 22, 1994.

Before the Federal Energy Regulatory Commission, Surrebuttal Testimony on behalf of Koch Gateway Pipeline Company, Docket No. RP93-205-000, November 29, 1993.

Before the Federal Energy Regulatory Commission, Direct Testimony on behalf of Koch Gateway Pipeline Company, Docket No. RP93-205-000, September 30, 1993.

Before the Indiana Utility Regulatory Commission, Direct Testimony on behalf of PSI Energy, Inc.(now Duke Energy Indiana), Cause Nos. 39646, 39584-S1, June 23, 1993.

Before the Minnesota Public Utilities Commission, Rebuttal Testimony on behalf of Northern States Power Company, Docket Nos. E002/GR-92-1185, G002/GR-92-1186, March 23, 1993.

Before the Pennsylvania Public Utility Commission, Rebuttal Testimony on behalf of Pennsylvania Gas and Water Company, Docket No. R-22482, March 9, 1993.

Before the State of Maine Public Utilities Commission, Direct Testimony on behalf of Central Maine Power, Docket No. 90-085-A, January 7, 1993.

Before the Federal Energy Regulatory Commission, Affidavit regarding Order 636-A Compliance Filing Proposed Restructuring on behalf of United Gas Pipe Line Company, Docket No. RS92-26-000, October 29, 1992.

Before the Federal Energy Regulatory Commission, Rebuttal and Cross Answering Testimony on behalf of Exxon Pipeline Company, Docket Nos. IS92-3-000, *et.al.*, August 10, 1992.

Before the Arizona Corporation Commission Task Force on Externalities, Comments in Response to Shortcomings and Pitfalls in Attempts to Incorporate Environmental Externalities into Electric Utility Least-cost Planning, Docket No. U-000-92-035, March 20, 1992.

Before the Federal Energy Regulatory Commission, Rebuttal Testimony on behalf of Texas Eastern Transmission Corporation, Docket Nos. CP90-2154-000, RP85-177-008, RP88-67-039, *et.al.*, RP90--119-001, *et.al.*, RP91-4-000, RP91-119, and RP90-15-000, January 30, 1992.

Before the Federal Energy Regulatory Commission, Rebuttal Testimony on behalf of Washington Gas Light Company, Docket Nos. RP90-108-000, *et.al.*, RP90-107-000, January 17, 1992.

Before the Federal Energy Regulatory Commission, Comments in Response to Notice of Proposed Rulemaking on behalf of United Gas Pipe Line Company, Docket No. RM92-11-000, October 15, 1991.

Before the Federal Energy Regulatory Commission, Direct Testimony on behalf of Washington Gas Light Company, Docket Nos. RP91-82-000, *et.al.*, August 27, 1991.



Before the Arizona Corporation Commission, Rejoinder Testimony on behalf of Arizona Public Service Company, Docket Nos. U-1345-90-007 and U-1345-89-162, June 18, 1991.

Before the Federal Energy Regulatory Commission, Comments submitted in Response to Notice of Public Conference and Request for Comments on Electricity Issues, Docket No. PL91-1-000, June 10, 1991.

Before the Arizona Corporation Commission, Rebuttal Testimony on behalf of Arizona Public Service Company, Phase II, Docket Nos. U-1345-90-007 and U-1345-89-162, May 3, 1991.

Before the Federal Energy Regulatory Commission, Direct Testimony on behalf of United Gas Pipe Line Company, Docket Nos. RP91-126-000, CP91-1669-000, CP91-1670-000, CP91-1671-000, CP91-1672-000, and CP91-1673-000, April 15, 1991.

Before the Federal Energy Regulatory Commission, Comments on Electricity Issues, Docket No. PL91-1-000, April 12, 1991.

Before the Arizona Corporation Commission, Rebuttal Testimony on behalf of Arizona Public Service Company, Docket No. U-0000-90-088, November 26, 1990.

Before the State of Maine Public Utilities Commission, Rebuttal Testimony and Exhibits on behalf of Central Maine Power, Docket No. 90-076, November 16, 1990.

Before the State Corporation Commission of Virginia, Direct Testimony on behalf of Historic Manassas, Inc., SCC Case No. PUE 890057, VEPCO Application 154, November 2, 1990.

Before the Iowa Utilities Board, Comments Prepared at the Request of Iowa Electric Light and Power Company on Iowa's Proposed Rulemaking Related to Utility Energy Efficiency Programs, Docket No. RMU90-27, October 15, 1990.

Before the Arkansas Public Service Commission, Testimony on behalf of Arkla, Inc., Docket no. 90-036-U, August 31, 1990.

Before the Federal Energy Regulatory Commission, Rebuttal Testimony on behalf of Northeast Utilities Service Company, Docket Nos. EC90-10-000, ER90-143-000, ER90-144-000, ER90-145-000 and EL90-9-000, July 20, 1990.

Before the Illinois Commerce Commission, Testimony on behalf of Commonwealth Edison, Docket No. 90-0169, July 17, 1990.

Before the Federal Energy Regulatory Commission, Rebuttal Testimony on behalf of New York State Customer Group (Niagara Mohawk Power Corporation; Rochester Gas & Electric Corporation; New York State Electric & Gas Corporation), Docket Nos. RP88-211-000, RP88-10-000, RP90-27-000, June 1, 1990.

Before the Federal Energy Regulatory Commission, Statement on behalf of Public Service Company of Indiana, now Duke Energy Indiana, Docket Nos. ER89-672-000, February 15, 1990.

Before the Federal Energy Regulatory Commission, Prepared Direct Testimony submitted on behalf of The New York State Customer Group, which includes Niagara Mohawk Power Corporation, Rochester Gas and Electric



Corporation and New York State Electric & Gas Corporation, Docket Nos. RP88-211-000, RP88-10-000, RP88-215-000 and RP90-27-000, January 23, 1990.

Before the Arkansas Public Service Commission, Rebuttal Testimony on behalf of Arkansas Power & Light Company, Docket No. 89-128-U, January 12, 1990.

Before the Federal Energy Regulatory Commission, Prepared Answering Testimony Sponsored by Texas Eastern Transmission Corporation, Docket Nos. RP88-67-000 and RP88-81-000, January 10, 1990.

Before the Federal Energy Regulatory Commission, Comments on the Federal Energy Regulatory Commission's Proposed Policy Statement on Gas Inventory Charges, Docket No. PL89-10999, July 1989.

Before the Public Utilities Commission of Texas, Direct Testimony on behalf of Enron-Dominion Cogen Corporation, Docket No. 8636, June 12, 1989.

Before the Maine Public Utilities Commission, Direct Testimony on behalf of Central Maine Power Company, Docket No. 88-310, March 1, 1989.

Before the Public Utilities Commission of Ohio, Comments Submitted on behalf of Dayton Power and Light Company, In the Matter of the Revision and Promulgation of Rules for Long Term Forecast reports and Integrated Resource Plans of Electric Light Companies, Case no. 88-816-EL-OR, November 21, 1988.

Before the Federal Energy Regulatory Commission, Comments of the Energy and Environmental Policy Center, RE: Regulations Governing Independent Power Producers, Docket No. RM88-4-000, July 18, 1988.

Before the Federal Energy Regulatory Commission, Comments of the Energy and Environmental Policy Center, RE: Regulations Governing Bidding Programs, Docket No. RM88-5-000, July 18, 1988.

Before the Federal Energy Regulatory Commission, Comments of the Energy and Environmental Policy Center, Re: Administrative Determination of Full Avoided Costs, Sales of Power to Qualifying Facilities, and Interconnection Facilities, Docket No. RM88-66-000, July 18, 1988.

Before the Maine Public Utilities Commission, Testimony on behalf of Central Maine Power Company, Docket No. 88-111, June 22, 1988.

Before the Federal Energy Regulatory Commission, Comments of the Energy and Environmental Policy Center, Re: Brokering of Interstate Natural Gas Pipeline Capacity, Docket No. RM88-13-000, June 17, 1988.

Before the Federal Energy Regulatory Commission, Comments of the Energy and Environmental Policy Center, Re: Administrative Determination of Full Avoided Costs, Sales of Power to Qualifying Facilities, and Interconnection Facilities, Docket No. RM88-6-000, June 16, 1988.

Before the Federal Energy Regulatory Commission, Rebuttal Testimony on behalf of Public Service Company of New Mexico, April 12, 1988.

Before the Federal Energy Regulatory Commission, Oral Comments, Re: Order No. 500, Docket No. RM87-34-000 *et.al.*, March, 1988.



Before the Federal Energy Regulatory Commission, Statement on behalf of Transwestern Pipeline Company, Docket No. CP88-143-000, March, 1988.

Before the Public Service Commission of New Hampshire, Testimony on behalf of Public Service Company of New Hampshire, Docket No DR88-000, January 7, 1988.

Before the Ontario Energy Board, Testimony on behalf of ICG Utilities (Ontario) LTD, *The 1987 Amended Gas Pricing Agreement*, E.B.R.O. 411-III *et.al.*, November, 1987.

Before the New Hampshire Public Utility Commission, Technical Statement on behalf of Public Service Company of New Hampshire, Filing of special Contract No. NHPUC-54 Between Nashua Corporation and Public Service Company of New Hampshire, October 30, 1987.

Before the Federal Energy Regulatory Commission, Statement on behalf of Arkla, Inc., included as an exhibit in Arkla, Inc.'s Comments on Notice of Proposed Rulemaking, Docket No. RM87-34-000, October 13, 1987.

Before the Pennsylvania Public Utility Commission, Rebuttal Testimony on behalf of West Penn Power Company, Docket No. R-850220, September 28, 1987.

Before the Public Service Commission of New York, Prepared Rebuttal Testimony on behalf of National Fuel Gas Distribution Company, September 14, 1987.

Before the New Hampshire Public Utilities Commission, Prefiled Direct Testimony on behalf of Public Service Company of New Hampshire, Docket No. DR87-151, August 28, 1987.

Before the Pennsylvania Public Utility Commission, Direct Testimony on behalf of West Penn Power Company, Docket No. R-850220, Reconsideration, July 27, 1987.

Before the Commonwealth of Massachusetts Department of Public Utilities, Statement on behalf of Boston Edison Company, Docket Nos. 86-36, June 12, 1987.

Before the State of Illinois Commerce Commission, Rebuttal Testimony on behalf of Commonwealth Edison Company, Docket Nos. 87-0043, 87-0044, 8700096, May 4, 1987.

Before the Federal Energy Regulatory Commission, Comments on behalf of Tennessee Gas Pipeline Company, *In the Matter of Iroquois Gas Transmission System*, Docket No. CP86-523-001, March 9, 1987.

Before the New Hampshire Public Utility Commission, Direct Testimony on behalf of Public Service Company of New Hampshire, NHPUC Docket No. DR86-122, March 3, 1987.

Before the Federal Energy Regulatory Commission, Comments on behalf of Transwestern Pipeline Company, *In the Matter of Notice of Inquiry into alleged anticompetitive Practices Related to Marketing Affiliates of Interstate Pipelines*, Docket No. RM87-5-000, December 29, 1986.

Before the Maine Public Utilities Commission, Testimony on behalf of Central Maine Power Company, Docket No. 86-215, Re: Proposed Amendments to Ch. 36, December 18, 1986.



- Before the Utah Public Service Commission, Surrebuttal Testimony on behalf of NUCOR Steel Corporation, *In the Matter of the Investigation of Cost of Service Issues for Utah Power & Light Company*, Case No. 85-035-06, December 5, 1986.
- Before the Public Service Commission of New York, Prepared Direct Testimony on behalf of National Fuel Gas Distribution Corporation, Case Nos. 38947 and 28954, November 21, 1986.
- Before the Federal Energy Regulatory Commission, Prepared Rebuttal Testimony on behalf of Transwestern Pipeline Company, Docket No. RP86-126, November 13, 1986.
- Before the Federal Energy Regulatory Commission, Prepared Cross-Answering Testimony on behalf of Members of the New England Customer Group, Docket No. RP86-119, October 28, 1986.
- Before the Federal Energy Regulatory Commission, Prepared Testimony on behalf of Members of the New England Customer Group, Docket No. RP86-119, October 14, 1986.
- Before the Utah Public Service Commission, Rebuttal Testimony on behalf of NUCOR Steel Corporation, Docket No. 85-035-04, September 30, 1986.
- Before the State of New Jersey Department of Energy, Board of Public Utilities, Rebuttal Testimony on behalf of Elizabethtown Gas Company, September, 1986.
- Before the State of Illinois Commerce Commission, Testimony on behalf of Commonwealth Edison Company, Docket No. 86-0249, August 25, 1986.
- Before the Public Utilities Commission of Ohio, Rebuttal Testimony on behalf of Ohio Power Company, Case No. 85-726-EL-AIR, April, 1986.
- Before the State of New Jersey Department of Energy, Board of Public Utilities, Testimony on behalf of Elizabethtown Gas Company, Docket No. 8112-1039, March, 1986.
- Before the Maine Public Utilities Commission, Rebuttal Testimony on behalf of Central Maine Power Company, Docket No. 85-132, March, 1986.
- Before the Federal Energy Regulatory Commission, Comments on behalf of National Economic Research Associates, Inc., *Notice of Inquiry Re: Regulation of Electricity Sales-for-Resale and Transmission Service, 18 C.F.R. Parts 35 and 290, Issued June 28, 1985*, Docket No. RM85-17-000 (Phase II), January 23, 1986.
- Before the Alaska Public Utilities Commission, Rebuttal Testimony on behalf of Seagull, Enstar Corporation, and Enstar Natural Gas Company, U-84-67, December, 1985.
- Before the Virginia State Corporation Commission, Rebuttal Testimony on behalf of Dominion Resources, Inc. and Virginia Electric and Power Company, Case No. PUE 830060, November 26, 1985.
- Before the Federal Energy Regulatory Commission, Comments on behalf of National Economic Research Associates, Inc., *Notice Requesting Supplemental Comments Re: Regulation of Natural Gas Pipeline After Partial Wellhead Decontrol*, Docket No. RM85-1-000 (Part D), November 18, 1985.





- Before the Federal Energy Regulatory Commission, Oral Comments on behalf of National Economic Research Associates, Inc., *Notice of Inquiry Re: Regulation of Electricity Sales-for-Resale and Transmission Services* (Phase II), Docket No. RM85-17-000, November 4, 1985.
- Before the Public Service Commission of Wisconsin, Rebuttal Testimony on behalf of Eastern Wisconsin Utilities, Docket No. 05-EP-4, November, 1985.
- Before the Federal Energy Regulatory Commission, Oral Comments on behalf of National Economic Research Associates, Inc., *Notice of Inquiry Re: Regulation of Electricity Sales-for-Resale and Transmission Services* (Phase I), Docket No. RM85-17-000, August 9, 1985.
- Before the Maine Public Utilities Commission, Direct Testimony on behalf of Central Maine Power Company, Docket No. 85-132, August, 1985.
- Before the Public Utilities Commission of Ohio, Direct Testimony on behalf of Ohio Power Company, Docket No. 85-726-EL-AIR, July, 1985.
- Before the Public Service Commission of Wisconsin, Direct Testimony on behalf of Wisconsin Gas Company, Docket Nos. 05-UI-18 and 6650-DR-2, June, 1985.
- Before the Ontario Energy Board, Testimony on behalf of Unicorp of Canada Corporation, *In the Matter of Union Enterprises Ltd. and Unicorp of Canada Utilities Corporation*, E.B.R.L.G. 28, Exhibit 10.4, April, 1985.
- Before the Utah Public Utilities Commission, Testimony on behalf of NUCOR Steel, Docket No. 84-035-01 (Rate Spread Phase), January, 1985.
- Before the Nuclear Regulatory Commission, Affidavit for Alabama Power Company, October 1984.
- Before the Federal Energy Regulatory Commission, Prepared Direct Testimony on behalf of Consolidated Gas Supply Corporation, *Application of Consolidated Gas Supply Corporation for Rate Relief*, Docket No. RP82-115, April, 1984.
- Before the Public Utilities Commission of Ohio, Rebuttal Testimony on behalf of East Ohio Gas Company, *et.al., In the Matter of the Investigation into Long Term Solutions Concerning Disconnection of Gas and Electric Service During Winter Emergencies*, Case No. 83-303-GE-COI, March, 1984.
- Before the Federal Energy Regulatory Commission, Testimony on behalf of Florida Power and Light Company, Docket Nos. ER82-793 and EL83-24, February, 1984.
- Before the Public Utilities Commission of Ohio, Direct Testimony on behalf of East Ohio Gas Company, *et.al., In the Matter of the Investigation into Long Term Solutions Concerning Disconnection of Gas and Electric Service During Winter Emergencies*, Case No. 83-303-COI, January, 1984.
- Before the Federal Energy Regulatory Commission, Supplemental Direct Testimony on behalf of Consolidated Gas Supply Corporation, Docket No. RP81-80, September, 1983.
- Before the Arkansas Public Service Commission, Direct Testimony on behalf of Arkansas Louisiana Gas Company, Docket No. 83-161-U, August, 1983.



Before the New Mexico Public Service Commission, Testimony on behalf of Public Service Company of New Mexico, Case No. 1811, July 17, 1983.

Before the Federal Communications Commission, Rebuttal Case Testimony on behalf of Interstate Mobile Phone Company, in *American Mobile Commission of Washington and Oregon*, CC Docket No. 83-445, June, 1983.

Before the Public Service Commission of Indiana, Prepared Rebuttal Testimony on behalf of Northern Indiana Public Service Company, Case No. 37023, May, 1983.

Before the Public Service Commission of New York, Testimony on behalf of the Industrial Energy Users Association, in *Procedure to Inquire into the Benefits to Ratepayers and Utilities from Implementation of Conservation Programs that will Reduce Electric Use*, Case No. 28223, May, 1983.

Before the Public Utilities Commission of Maryland, Testimony on behalf of the Mid-Atlantic Petroleum Distributors Association, the Oil Heat Association of Washington, and Steuart Petroleum Company, Case No. 7649, May, 1983.

Before the Connecticut Department of Public Utility Control, Testimony on behalf of the Independent Petroleum Association, Docket No. 83-01-01, April, 1983.

Before the State Corporation Commission of Virginia, Testimony on behalf of the Mid-Atlantic Petroleum Distributors Association, the Oil Heat Association of Washington, and Steuart Petroleum Company, Case No. PUE 830008, March, 1983.

Before the Federal Energy Regulatory Commission, Rebuttal Testimony on behalf of Arkansas Louisiana Gas Company, Docket Nos. RP82-75-000 *et.al.*, February 1983.

Before the Federal Communications Commission, Rebuttal Case Testimony on behalf of Interstate Mobile Phone Company, in *American Mobile Communications of Washington and Oregon*, CC Docket No. 83-3, February, 1983.

Before the Federal Energy Regulatory Commission, Prepared Testimony on behalf of Consolidated Gas Supply Corporation, in *Application of Consolidated Gas Supply Corporation for Rate Relief*, Docket No. RP82-115, July, 1982.

Before the Federal Energy Regulatory Commission, Rebuttal Testimony on behalf of Consolidated Gas Supply Corporation, Docket No. RP81-80, April, 1982.

Before the Florida Public Service Commission, Testimony on behalf of Florida Power & Light Company, Docket No. 820097-EU, April, 1982.

Before the Massachusetts Department of Public Utilities, Direct Testimony on behalf of Boston Edison Company, Docket No. 906, January, 1982.

Before the New Mexico Public Service Commission, Testimony on behalf of Public Service Company of New Mexico, *In the Matter of New Mexico Public Service Commission Authorization for Southern Union Company to Transfer Certain Property to Western Gas Company*, NMPSC Case 1689, January, 1982.





- Before the Connecticut Department of Public Utility Control Authority, Testimony on behalf of Southern Connecticut Gas Works, *DPUC Investigation Into Utility Financing of Conservation and Efficiency Improvements*, Docket No. 810707, August, 1981.
- Before the Connecticut Public Utility Control Authority, Prepared Testimony on behalf of Connecticut Natural Gas Corporation, July, 1981.
- Before the Philadelphia Gas Commission, Testimony on behalf of Philadelphia Gas Works, in *PGW Rate Investigations*, July, 1981.
- Before the California Public Utility Commission, Prepared Testimony on behalf of Pacific Gas and Electric Company, In *Application of Pacific Gas and Electric Company for Rate Relief*, Application No. 68153, June, 1981.
- Before the Federal Energy Regulatory Commission, Prepared Testimony on behalf of Consolidated Gas Supply Corporation, Docket No. RP81-80, June, 1981.
- Before the Tennessee Valley Authority Board, Comments on Tennessee Valley Authority Proposed Determinations on Ratemaking Standards, Contract TV-53565A, October, 1980.
- Before the Federal Energy Regulatory Commission, Testimony on behalf of Pennsylvania Power and Light Company, *Split-Savings and Emergency Tariffs*, August, 1980.
- Before the Public Service Commission of Maryland, Answering Testimony on behalf of the People's Counsel of Maryland re Baltimore Gas & Electric Company, Docket No. 7159, May 1, 1980.
- Final Report of Consultants' Activities Submitted to Tennessee Valley Authority Division of Energy Conservation and Rates, in *Consideration of Ratemaking Standards Pursuant to the Public Utility Regulatory Policy Act of 1978 (P.L. 95-617) and One Additional Standard*, Contract No. TV-53575A, May, 1980.
- Before the Utah Public Service Commission, Direct Testimony on behalf of NUCOR Steel, PSCU Case No. 83-035-06, 1980.
- Before the Council on Environmental Quality, Washington, D.C., statement on "Alaskan Natural Gas, May, 1980.
- Presentation entitled "An Analysis of the Proposed Building Energy Performance Standards (BEPS)," Washington, D.C. in March, 1980.
- Before the Ontario Energy Board, Testimony on behalf of the Public Interest Advocacy Board and National Anti-Poverty Organization, February 27, 1979.
- Before the Federal Power Commission/Federal Energy Regulatory Commission, Testimony with respect to Cogeneration Pricing Rules, 1979.
- Before the Federal Energy Regulatory Commission, Testimony on behalf of the State of Wisconsin in the Matter of the Northwest Alaskan Pipeline Company, Docket No. CP78-123, 1979.



Before the Federal Energy Administration, “The Effects of Middle Distillate Decontrol on the American Consumer: A Critique of the Decontrol Monitoring and Price Index Actions of the FEA with Michael McNamara and Rod Shaughnessy, Washington, D.C., August, 1977.

Before the Pennsylvania Public Utility Commission in Case No. 76-PRND-7, February 7, 1977.

Statements before the Council on Environmental Quality, Washington D.C., May 1977

Before the Wisconsin Public Service Commission, Testimony on behalf of the Environmental Defense Fund, December 1, 1976.

Before the Public Utilities Control Authority of the State of Connecticut, Testimony re Marginal Cost Pricing of Electricity and Natural Gas on behalf of the Environmental Defense Fund, July 22, 1976.

Before the Federal Energy Administration, “Analysis and Recommendations of Northern Tier Pipeline Proposals, July, 1976.

Before the Energy Council of the Federal Government, “Third State of EPCA: Additional Incentives,” June, 1976.

Before the Wisconsin Public Service Commission, Testimony with respect to Electric Rate Structures; Price Elasticity of Demand for Electricity; and Application for WEPCO for Authority to Construct and Place in Operation a Coal Fired Power Plant and Related Facilities in the Town of Pleasant Prairie, Kenosha County and Certain Related Transmission and Substation Additions, CA-5489, June, 1976.

Before the Federal Power Commission/Federal Energy Regulatory Commission, Testimony with respect to Alaskan Natural Gas, March, 1976.

Before the Federal Power Commission/Federal Energy Regulatory Commission, Testimony with respect to Natural Gas Pricing, March, 1976.

Before the Wisconsin Assembly Environmental Quality Committee, Testimony re Assembly Bill 1228, January 22, 1976.

Before the Public Utility Commission of Maine, Testimony on behalf of Attorney General of the State of Maine re electricity pricing principles, 1976.

Before the Federal Energy Administration, “Allocation of Canadian Crude Oil,” December, 1975.

Before the Federal Energy Administration, “Establish Energy Administration to Establish Mandatory Allocation of Canadian Crude Oil,” December 1975.

Before the Federal Energy Administration, Comments re Modification or Termination of the State Set-Aside Program, November 20, 1975.

Comments before the U.S. Department of Interior on its Study: Alaskan Natural Gas Transportation Systems, October 29, 1975.

Before the Public Service Commission of Minnesota, Rebuttal Testimony on behalf of the Minnesota Energy Agency in the Application of Northern States Power to Raise Rates, September 4, 1975.



Before the Public Service Commission of Minnesota, Testimony on behalf of the Minnesota Energy Agency in the Application of Northern States Power to Raise Rates, July 25, 1975

Before the Federal Energy Administration, "Rate Design and Its Relationship to Loan Management," June, 1975.

Comments before the Federal Power Commission on Proposed Rulemaking RM 75-19 on end Use Rate Schedules, May 30, 1975.

Before the Public Utilities Commission of Maine, Testimony in CMP Case No. F.C. 2072, February 7, 1975.

Before the Federal Energy Administration, "Modification or Termination of the State Set-Aside Program," 1975.

Before the California Public Utilities Commission, Testimony on behalf of the Environmental Defense Fund in the Application of Pacific Gas & Electric to raise its rates, Application No. 54279, 1975.

Before the Public Service Commission of the State of Nevada, Testimony on behalf of the Washoe County District Attorney's Office in the Matter of the Application of Sierra Pacific Power Company for Authority to Increase Rates for Electric, Gas and Water Service, Docket Nos. 574, 575, and 576, 1974-76

Before the Michigan Public Service Commission, Testimony in the matter of Detroit Edison Company, Case No. U-4570 and Consumers Power Company, Case No. U-4576, 1974.

Before the Virginia State Corporation Commission, Testimony on behalf of the Central Virginia Environmental League, Case No. 10848, 1974.

Before the Federal Energy Regulatory Commission, Testimony on behalf of the Environmental Defense Fund re electricity pricing, October 8, 1974.

Before the New Jersey Public Utility Commission, Supplemental Testimony on behalf of the Environmental Defense Fund in PSEG rate increase case, August 8, 1974.

Before the Michigan Public Service Commission, Testimony on behalf of the Environmental Defense Fund in Detroit Edison Case No. U-4570, August 8, 1974.

Before the Maryland Public Service Commission, Testimony on behalf of the Environmental Defense Fund in Baltimore Gas & Electric Case No. 6700, January 24, 1974.

Before the Public Service Commission of Wisconsin, Supplemental Testimony on behalf of the Environmental Defense Fund in Madison Gas & Electric Rate Increase Case 1973.

Before the Federal Power Commission/Federal Energy Regulatory Commission Testimony With Respect to El Paso Natural Gas Coal Gasification, 1972.

Before the Federal Power Commission/Federal Energy Regulatory Commission Testimony With Respect to El Paso Natural Gas Pricing, 1972.

Comments before various Utility Regulatory Commissions (Maryland, New York, Michigan, New Jersey, Arkansas, Maine, California, Florida, Rhode Islands, Minnesota, Connecticut, Massachusetts, Missouri, Nevada, New Hampshire, Vermont, Virginia, Wisconsin, Texas, Ontario, Philadelphia, New Mexico,



Pennsylvania, TVA, Indiana) on Marginal Cost Pricing of Electricity; Conservation; Rate of Return; Diversification; Nuclear Cancellation; Sale of Utility Property; and Public Policy, 1972-1976.

Before various Canadian Regulatory Commissions, Testimony on Energy and Telephone Pricing, 1972-1976.

Before the U.S. Postal Rate Commission, Testimony on Marginal Cost Pricing of Postal Rates, 1972.

Before the Federal Communications Commission, Testimony on Telegraph Price Elasticity and Cellular Mobile Telephone Pricing, 1972

Before the Public Service Commission of Wisconsin, Testimony on behalf of the Environmental Defense Fund in Madison Gas & Electric Rate Increase Case, 1972.

Before the Council on Environmental Quality, US Department of the Interior and Joint Economic Committee on the National Environmental Policy Act (NEPA) and the Trans Alaska Pipeline on behalf of the Center for Law and Social Policy, Environmental Defense Fund, Wilderness Society and Friends of the Earth (FOE).

Before the Federal Power Commission, Testimony with respect to The Economics of Preservation versus Development of Hells Canyon, Hearings Nos. 2243/73, 1969.

Before the Federal Power Commission, Exhibit R-667, Technical Note Estimating the Present Value of a Non-Reproducible Asset With Increasing Annual Benefits Over Time, Hearings Nos. 2243/73, 1969.

Before the FCC, Testimony for Western Union Telegraph Company and related Statistical Analysis of Elasticity of Demand for Public Message Telegraph Service(1968). The Western Union work included econometric analyses to determine the price elasticity of demand for various classes of service to change rates from distance related charges to a "postalized" system, and insure the recovery of required rate of return.

Consultant to Robert R. Nathan Associates, The Impact of Mine Drainage on Recreation (Appendix E, Appalachian Regional Commission, 1969). State of New York: an analysis recreation participation to develop the recreational attributes of Finger Lakes (1969).

Consultant to Mathematica Inc. (Princeton, NJ), estimate an econometric model for the visitor industry in Hawaii to design state tax and tourist policy. (Visitor Industry and Hawaii's Economy: A Benefit Cost Analysis, MATHEMATICA, Inc., Princeton, NJ 1969.)

Wharton School of Finance, The Demand for Water Oriented Recreation, RFF Mimeo, 1967.



1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF MARK**  
 21 **MCDONALD, M.D. IN SUPPORT**  
 22 **OF MOTION FOR PRELIMINARY**  
 23 **INJUNCTION**

24 Judge: Hon. Dean D. Pregerson

25 I MARK MCDONALD, M.D., declare as follows:

26 1. I am a clinical psychiatrist retained by Plaintiffs to render an expert  
 27 opinion in this action. I make this declaration based on my own personal knowledge. If  
 28 called as a witness, I would testify competently as follows.

2. I have reviewed the court filing and exhibits provided by Plaintiffs and  
 have reached an opinion on the question of safety for children to return to K-12 school  
 in fall 2020 in the state of California.



1           3. My training, expertise, and skills qualify me to express the opinions set  
2 forth in this declaration. I am a UCLA-trained double-boarded psychiatrist (adult and  
3 child & adolescent psychiatry) in active full-time clinical practice. I have worked in  
4 child and adolescent inpatient psychiatric hospital units (including those for eating  
5 disordered patients), residential substance abuse treatment programs for young adults,  
6 and incarcerated juvenile treatment programs. I began my private practice in Los  
7 Angeles in 2013, specializing in child and adolescent psychiatry, in which I provide  
8 therapy to individuals, couples, and families; play therapy to children; and medication  
9 treatment to individuals of all ages. Attached as Exhibit 7 is a true and correct copy  
10 of my CV.

11           4. In forming my opinion, I relied on matters of a type reasonably relied upon  
12 by experts in my field, to wit, peer-reviewed medical evidence related to the question of  
13 safety for children to return to K-12 school. The underlying facts revealed by this  
14 evidence led to my ultimate conclusion, namely, that there is no potential for  
15 meaningful medical harm for children to return to the classroom now or in the fall.

16           5. According to the CDC, based on the most recent data available from July  
17 22, 2020, no child under age 18 in the state of California has died due to infection from  
18 the coronavirus since tracking began on February 1, 2020. This contrasts with 1,033  
19 deaths of all causes in children under age 15 during the same time period. Unlike  
20 seasonal flu, which kills approximately 200 children per year nationally, the  
21 coronavirus largely spares children. The hospitalization rate in children who are  
22 infected is exceedingly low and makes up an insignificant percentage of total  
23 hospitalizations within the general population.

24           6. Numerous recent studies performed in Europe have shown low rates of  
25 infection among children attending school and low rates of transmission of the virus  
26 from children to adults. Most recent and notable among them, a July 15, 2020 German  
27 study from the University of Dresden found that among 2,000 students and teachers,  
28 few students became infected with the virus, and no meaningful transmission occurred



1 from students to teachers. One of the study's author's concluded that, in fact, children  
2 appeared to act as a barrier to transmission. Following publication, the local German  
3 state of Saxony dropped mask requirements in schools, finding that they served no  
4 purpose. Most European nations have re-opened their schools, and none have reported a  
5 meaningful increase in pediatric illness or measurable transmission from children to  
6 adults.

7 7. Keeping schools closed contributes to a substantial known risk to  
8 children's health and safety. Psychological, social, and emotional development requires  
9 children to both spend time away from parents and with their peers, in structured  
10 settings, such as school. Robbing them of this critical experience places them at high  
11 risk of stunted growth and developmental arrest. In addition, extended periods of  
12 confinement provoke numerous mental and emotional illnesses such as depression,  
13 anxiety, phobias, self-harming behaviors and suicide. In vulnerable populations,  
14 physical and sexual abuse at home will worsen. I have seen a substantial increase in  
15 illness among existing pediatric patients in my clinical practice, all of whom have been  
16 confined at home for over three months. For patients with cognitive developmental  
17 delays like autism, most have regressed in years, and many have become violent toward  
18 themselves and their parents. No child in my practice has maintained or improved in his  
19 emotional condition since school closures began in March 2020.

20 8. Re-opening all schools in California is necessary to protect the health and  
21 safety of the state's children. There is no medical basis for continuing to keep schools  
22 closed; in fact, not re-opening will certainly cause significant harm to children. This  
23 harm will worsen the longer children are kept from returning to school.

24 I declare under the penalty of perjury under the laws of the United States of  
25 America and the State of California that the foregoing is true and correct.

26  
27 Dated: July 23, 2020

DocuSigned by:

*Mark McDonald*

6632556EC345441...

Dr. Mark McDonald

**EXHIBIT 7**

---

## MARK MCDONALD, M.D.

---

### LICENSES AND BOARD CERTIFICATIONS

Qualified Medical Evaluator (QME), State of California DWC – 2015  
American Board of Psychiatry (ABPN), Child and Adolescent Certification – 2012  
ABPN, Adult Certification – 2011  
State of California medical license – 2010  
DEA registration with buprenorphine prescribing license – 2010

### EMPLOYMENT

PRESIDENT, MARK MCDONALD, M.D. INC.; LOS ANGELES, CA – 2013-PRESENT  
Psychiatric evaluation and treatment of children, adolescents, and adults with both medication management and individual therapy; QME evaluation for State of California DWC; independent medical evaluation (IME) for disability, return-to-work, and fitness-for-duty; medical-legal consultation, including medical record review and deposition preparation; expert witness reporting and deposition; clinical teaching and seminars for Maple Counseling Center and Psychoanalytic Center of California

STAFF PSYCHIATRIST, LA COUNTY DMH; LOS ANGELES, CA – 2012-2014  
Psychiatric evaluation and treatment of pre and post-adjudicated minors—juvenile hall and camp—for Los Angeles County Department of Mental Health

STAFF PSYCHIATRIST, PACIFIC HOSPITAL; LONG BEACH, CA – 2010-2012  
Adult inpatient psychiatric evaluation and treatment for three hospital units, weekend coverage; adult medical inpatient psychiatric consultation and treatment on medical floor, weekend coverage

STAFF PSYCHIATRIST, ST. ELIZABETH HOSPITAL; EDGEWOOD, KY – 2010-2010  
Adult inpatient psychiatric evaluation and treatment for 24-bed unit, weekend coverage

### EDUCATION

PSYCHOANALYTIC CENTER OF CALIFORNIA (PCC), CANDIDATE IN ADULT  
PSYCHOANALYSIS – 2012-PRESENT  
PCC, ADULT PSYCHOANALYTIC PSYCHOTHERAPY PROGRAM – 2012  
HARBOR-UCLA CHILD AND ADOLESCENT PSYCHIATRY FELLOWSHIP – 2012  
UNIVERSITY OF CINCINNATI ADULT PSYCHIATRY RESIDENCY – 2010  
MEDICAL COLLEGE OF WISCONSIN: DOCTOR OF MEDICINE – 2007  
UNIVERSITY OF CALIFORNIA, BERKELEY: BACHELOR OF ARTS JAPANESE HISTORY,  
FIRST HONORS – 1995

### LANGUAGES

Proficiency in speaking and writing Japanese, Spanish, and French

11500 W Olympic Blvd Suite 426 Los Angeles, CA 90064 310-954-9570 p 310-272-5836 f  
expert@markmcdonaldmd.com www.markmcdonaldmd.com

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF ROBERT C.**  
 21 **HAMILTON, M.D., F.A.A.P., IN**  
 22 **SUPPORT OF MOTION FOR**  
 23 **PRELIMINARY INJUNCTION**

Judge: Hon. Dean D. Pregerson

24 **I ROBERT C. HAMILTON, M.D., declare as follows:**

25 1. I am a pediatric physician retained by Plaintiffs to render an expert opinion  
 26 in this action. I make this declaration based on my own personal knowledge. If called  
 27 as a witness, I could and would testify competently as follows.

28 2. I have reviewed the court filings provided by Plaintiffs and have reached  
 an opinion on the question of safety for children to return to K-12 school in fall 2020 in  
 the state of California.



1           3. My training, expertise, and skills qualify me to express opinions set forth  
2 in this declaration. I am a full-time general pediatrician in Santa Monica, California. I  
3 am a graduate of Humboldt State University and UC Davis, where I majored in science  
4 and biochemistry. I graduated from UCLA medical school, where I also completed my  
5 residency and chief residency. I have been in practice in the community for the past  
6 thirty-six years. I also have had several academic appointments, including Assistant  
7 Clinical Professor of Pediatrics at UCLA and Instructor of Pediatrics at Western  
8 University School of Medicine. I am the author of a published book, titled *Seven*  
9 *Secrets of the Newborn: Secrets and (Happy) Surprises of the First Year* (2018). I am  
10 also a member of the American Academy of Pediatrics, California Chapter and the Los  
11 Angeles Pediatric Society. Attached as Exhibit 8 is a true and correct copy of my CV.

12           4. I base my opinion regarding school opening on published studies that  
13 consider the medical effect COVID-19 has had on the health of children, conversations  
14 I have had with knowledgeable colleagues, and my personal experience. The  
15 underlying facts, supported by the evidence, lead me to conclude that children must  
16 return to in-person instruction.

17           5. First, it is clear that children are tolerating COVID-19 infections much  
18 better than adults. The overall number of children (0-18 years of age) who have been  
19 infected with COVID-19 represents only eight percent of all cases of COVID-19 in the  
20 country. Of those who do get infected, the mortality rate is one-fifth of one percent.  
21 Far more children in this age category die from the flu annually than have died from  
22 coronavirus.

23           6. Second, the closing of schools this last spring and the conversion from in-  
24 class teaching to online instruction turned out to be an educational failure. Up to one-  
25 third of high school students in the Los Angeles school system never checked in with  
26 their teachers once. The reasons are numerous but could possibly be due to the lack of  
27 internet access or even lack of computers. In other words, the shutdown of the schools  
28 revealed the depth of the digital divide.

1           7.     Third, children are not spreading the virus to adults in any significant level.  
 2 Dr. Mark Woolhouse, a Professor of Infectious Disease from Edinburgh, Scotland, after  
 3 reviewing the literature that pertained to this matter, stated that “there have been no  
 4 recorded cases of a teacher catching coronavirus from a pupil anywhere in the world.”  
 5 Furthermore, the current President of the American Academy of Pediatrics (“AAP”),  
 6 Sally Goza, recently wrote, “there is evidence that children are less likely to be infected,  
 7 less likely to have severe symptoms and less likely to spread the infection to others.”  
 8 Her comments were based on studies done in Switzerland, China, France and Australia.

9           8.     Both statements, one from an eminent pediatrician and the other from a  
 10 seasoned Infectious Disease specialist indicate that the infectious risks for children  
 11 returning to schools is minimal.

12           9.     Fourth, socialization is a critical part of a child’s education. Regarding this  
 13 issue, AAP President Goza has also said that “missing school can have serious  
 14 consequences for child health and well-being, particularly for students with disabilities  
 15 or with special healthcare needs.” As a pediatrician, I agree with these comments.

16           10.    From my own experiences in my office, it is clear to me that children are  
 17 not handling remote learning and endless quarantining well. Many are bored by  
 18 spending hours in front of a screen. Many others are gaining weight due to the lack of  
 19 activity. All of this is detrimental to their health and not good.

20           11.    For these reasons, it is time for children to return to school. Reopening of  
 21 schools is necessary to prevent further harm to our children and there is no medical  
 22 basis for preventing our children from receiving in-person instruction.

23  
24  
25  
26 ///

27 ///



I declare under the penalty of perjury under the laws of the United States of America and the State of California that the foregoing is true and correct.

Dated: July 25, 2020

DocuSigned by:  
*Robert Hamilton*

Dr. Robert C. Hamilton

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28





**EXHIBIT 8**

## **CIRRUCULUM VITAE**

Robert Curtis Hamilton, M.D., F.A.A.P.

Office telephone: (310) 264-2100

Office FAX: 310) 264-2108

E-mail: [rchamiltonmd@gmail.com](mailto:rchamiltonmd@gmail.com)

Date of Birth: May 25<sup>th</sup>, 1953

Place of Birth: Eureka, California, United States of America

Pre-Medical Education:

1. Humboldt State University: Arcata, California (9/1971-6/1974)
2. University of California, Davis: Davis, California (9/1974-6/1976)  
Degree: Bachelor of Science, Biochemistry

Medical Education:

- University of California, Los Angeles: Los Angeles, California (9/1976-6/1980)  
Degree: Doctor of Medicine

Hospital Training:

1. Internship/Residency: UCLA Department of Pediatrics  
Los Angeles, California 90025  
William F. Friedman, M.D., Chairman  
(June 1980-June 1983)
2. Chief Residency: UCLA Department of Pediatrics  
Los Angeles, California 90025  
William F. Friedman, M.D., Chairman  
(June 1983-June 1984)

Medical Practice:

1. Santa Monica Pediatric Medical Group (Partner in Group)  
2122 Wilshire Boulevard  
Santa Monica, California 90404  
(July 1984-October 1996)
2. Pacific Ocean Pediatrics (President of Group)  
2216 Santa Monica Boulevard, #204

Santa Monica, California 90404  
(October 1996-Present)

Hospital Affiliations:

1. Saint John's Health Center  
1328 22<sup>nd</sup> Street  
Santa Monica, California 90404
2. Santa Monica/UCLA  
1250 16<sup>th</sup> Street  
Santa Monica, California 90404

Academic Appointments:

1. Assistant Clinical Professor of Pediatrics  
University of California, Los Angeles  
Los Angeles, California 90025
2. Instructor of Pediatrics  
Western University School of Medicine  
Pomona, California

Hospital Responsibilities:

1. Saint John's Health Center
  - A. Member, Pediatric Committee-current
  - B. Speaker's Coordinator, Department of Pediatrics (1984-2017)
2. Santa Monica/UCLA Hospital: Clinical Instructor of Pediatrics

Non-Hospital Medical Related Responsibilities:

1. Past-President, Los Angeles Pediatric Society (10/2001-10/2002)
2. Coordinator, Gene and Eve Black Summer Internship Program, administered through the Los Angeles Pediatric Society, current
3. Coordinator, Lighthouse Medical Missions (Over the past 25 years I have led 31 medical mission teams to Central America, Africa and more recently Asia. Countries that we have served include: Nicaragua, Guatemala, Sierra Leone, The Gambia, Burundi, Benin, Burkina Faso, Liberia, Guinea Bissau, Democratic Republic of the Congo and Kyrgyzstan.)
4. Board of Advisors: [\*] Insyght Corporation (2011 – current)
5. Board of Advisors: Pacifica Christian High School (2010 – current)

6. Board of Advisors: Claris Health (2008 – current)
7. Board of Advisors: PROLLERGY Corporation (2018)
8. Board of Directors: Santa Monica Symphony Orchestra (2013-current)

Professional Societies:

1. American Academy of Pediatrics, California Chapter #2
2. Los Angeles Pediatric Society

Certification: Fellow in the American Academy of Pediatrics: 1986-present

Licensing:

1. California License: G046186
2. DEA License: AH1619761

Media:

1. Podcast Host: “The Hamilton Review: Where Kids and Culture Collide”
2. Producer and creator of “Hamilton Hold” video, “How to Calm a Crying Baby”. Video on YouTube has garnered over 44 million views
3. Guest: Good Morning America (12/2015) (New York)
4. Guest: Fox and Friends (12/2015) (New York)
5. Guest: Dr. OZ Show (12/2015) (New York)
6. Guest: ‘Challenge Impossible’: CCTV-Channel 1, Beijing, People’s Republic of China (11/2016)
7. Guest: The Dennis Prager Show (11/2018)
8. Guest: Eric Metaxas Show (12/2018)
9. Guest: The Evening Beat, Spectrum News (12/2018)
10. Guest Speaker: American Visionary Art Museum (3/2019)
11. Guest Speaker: Mommy Con (4/2019)
12. Guest: Access Online (5/2019)
13. Guest: The Dennis Prager Show (5/2020)
14. Guest: The Ingraham Angle, Fox News (5/2020)
15. Guest: The Ingraham Angle, Fox News (6/2020)
16. Guest: The Evening Beat, Spectrum News (7/2020)

Articles:

1. The Effect of Prophylactic Acetaminophen Administration of Reactions to DPT Vaccination: Lewis, Cherry, Sachs, Woo, Hamilton, Tarle and Overturf, American Journal of the Diseases of Children, January 1988
2. Making an Impossible Trip Possible: Kobal, Czer, Czer, Feldsher, Hamilton and Siegel, Chest, 125:1, January 2004

3. *Wall Street Journal* Opinion Section, “God Said, ‘Be Fruitful and Multiply’”, September 12, 2018
4. *Wall Street Journal* Opinion Section, “Let Children Go to Summer School”, May 18, 2020

Books:

1. *Seven Secrets of the Newborn: Secrets and (Happy) Surprises of the First Year*, St. Martin’s Press, New York, New York, September 2018

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

**DECLARATION OF JEFF BARKE,  
M.D. IN SUPPORT OF MOTION  
FOR PRELIMINARY INJUNCTION**

Judge: Hon. Dean D. Pregerson

20  
21  
22 I, JEFF BARKE, M.D., declare as follows:

23  
 24 1. I am a primary care primary care physician retained by Plaintiffs to render  
 25 an expert opinion in this action. I make this declaration based on my own personal  
 26 knowledge. If called as a witness, I could and would testify competently to the matters  
 27 set forth herein.  
 28



1           2.       I have reviewed the court filings provided by Plaintiffs and have reached  
2 an opinion on the question of safety for children to return to K-12 school in fall 2020 in  
3 the state of California. Given the evidence I reviewed, it led me to conclude that  
4 returning to in-person instruction poses very little risk to children.

5           3.       My training, expertise, and skills qualify me to express the opinions set  
6 forth in this declaration. I am a Board-Certified Primary Care Physician in private  
7 practice for the last 25 years. I completed medical school and family practice residency  
8 training at the University of California, Irvine. I have also taught at UC Irvine as an  
9 associate clinical professor. I have been a board member of the Orange County  
10 Medical Association, I am a former school board member for the Los Alamitos Unified  
11 School District, and I am the co-founder and current board chair of Orange County  
12 Classical Academy, a public charter school.

13          4.       Over the last several months, I have provided treatment for COVID-19  
14 patients on a daily basis.

15          5.       I have reviewed numerous data and science sources on COVID-19, which  
16 provide the basis for my opinion. One data point that has remained true throughout the  
17 pandemic is that COVID-19 poses an extremely low risk to school age children and the  
18 science showing very little, if any, risk of asymptomatic children passing COVID-19 to  
19 adults. Indeed, numerous recent studies released from Europe support this conclusion.

20          6.       A recent study of 2,000 children and teachers conducted in Germany found  
21 very few coronavirus antibodies among them, suggesting that schools and young people  
22 do not play as a big a role in transmission as previously feared.

23          7.       A recent report comparing the opening of schools in Sweden and Finland  
24 showed a similar conclusion. A true and correct copy is attached as Exhibit 9 .

25          8.       According to the CDC, no child had died from COVID-19 in the state of  
26 California. In fact, the CDC has issued a report on the importance of reopening  
27 America's schools this fall. Among other things, the CDC found that the :best available  
28



1 evidence indicates if children become infected, they are far less likely to suffer severe  
2 symptoms.” A true and correct copy is attached as Exhibit 10.

3 9. A study in Ireland found that there is no evidence of secondary  
4 transmission of COVID-19 from children attending school. A true and correct copy is  
5 attached as Exhibit 11.

6 10. A study by the British Columbia Minister of Health found that COVID-19  
7 virus has a very low infection rate in children. A true and correct copy is attached as  
8 Exhibit 12.

9 11. Children have a far higher risk of morbidity and mortality from seasonal  
10 influenza, yet we never shut down schools. Children also have a much higher risk of  
11 dying in an automobile accident or from drowning than from COVID-19 yet we still  
12 drive and keep our pools and beaches open.

13 12. It is my expert opinion that reopening schools with in-person instruction  
14 poses a very low risk to children. Countries all over Europe have opened their schools  
15 successfully and we should do the same. There is no medical basis for continuing to  
16 keep schools closed.

17  
18 I declare under penalty of perjury under the laws of the United States of America  
19 and the State of California that the foregoing is true and correct.

20  
21 Dated: July 24, 2020

DocuSigned by:  
  
5C755C03C4CD479...  
Dr. Jeff Barke

## EXHIBIT 9

# Covid-19 in schoolchildren

A comparison between Finland and Sweden

This title be downloaded from: [www.folkhalsomyndigheten.se/publicerat-material/](http://www.folkhalsomyndigheten.se/publicerat-material/).

You are welcome to cite our texts, but please remember to state the source. Images, photographs and illustrations are protected by copyright. In order to use them, permission must be given by the author.

© Public Health Agency of Sweden, Year 2020.

Article number: 20108-1

## About the report

- This report has been written to compare the effect of different approaches in regards to school closure, as a response to the covid-19 pandemic.
- It adds to the knowledge of the effectiveness of measures aimed at the mitigation of covid-19.
- It could be of interest for any decision maker involved in choosing the most effective measures.
- This report has been produced in cooperation with the Finnish Institute for Health and Welfare THL, represented by Dr Hanna Nohynek, MD PhD and Dr Otto Helve, MD PhD.

The Public Health Agency of Sweden

Johan Carlson  
General Director

# Table of contents

About the report..... 4

Abbreviations/glossary ..... 6

Summary..... 7

Background ..... 8

Data..... 9

Analysis/results ..... 11

Discussion ..... 13

Conclusions..... 14

References..... 15

## Abbreviations/glossary

Covid-19 – the infection caused by the new coronavirus SARS-CoV-2

ICU - intensive care unit

SARS-CoV-2 – the new coronavirus that causes covid-19



## Summary

This report is a comparison between Finland and Sweden, two in many ways similar countries who applied different measures regarding schools during the covid-19 pandemic. There is no difference in the overall incidence of the laboratory confirmed covid-19 cases in the age group 1-19 years in the two countries and the number of laboratory confirmed cases does not fluctuate with school closure or change in testing policy in Finland. In Sweden, the number of laboratory confirmed cases is affected by change in testing policy. Severe covid-19 disease as measured in ICU admittance is very rare in both countries in this age group and no deaths were reported. Outbreak investigations in Finland has not shown children to be contributing much in terms of transmission and in Sweden a report comparing risk of covid-19 in different professions, showed no increased risk for teachers.

In conclusion, closure or not of schools had no measurable direct impact on the number of laboratory confirmed cases in school-aged children in Finland or Sweden. The negative effects of closing schools must be weighed against the positive indirect effects it might have on the mitigation of the covid-19 pandemic.

## Background

This report is a comparison between Finland and Sweden, two in many ways similar countries who applied different measures regarding schools during the covid-19 pandemic. As covid-19 is a completely new infection to humankind there are still many question marks regarding what mitigation measures to apply for maximum effect.

Sweden is one of very few countries that decided to keep day care and primary schools open during the pandemic. School closure may have many negative effects, mainly of social character but also secondary effects such as parents having to stay at home with their children (1, 2). This could add to staffing problem for example in hospitals or other for society critical areas.

Children in general seem to be much less affected by covid-19 than adults (3, 4). They do not become severely ill in the same extent as adults and because of less severe symptoms or none at all, might be less infectious (5).

In Sweden this assumption and weighing in the negative effects of a school closure, resulted in the decision not to close day care or primary schools for children, when secondary schools and universities were closed on March 17.

In Finland on the other hand, all schools were closed on March 18 until May 13 with the exception of children in grades 1-3, who had the possibility to participate in regular on site teaching if their caretakers were working in areas that were considered critical for the society (18.3.-13.5) or if the caretakers deemed participation necessary (23.3.-13.5). However, caretakers of children in grades 1-3 were encouraged to have their children participate in distance learning from home.

Both in Finland and Sweden children usually start attending day care during their second year of life and preschool the year they turn six years old. Primary school is from seven to fifteen years of age followed by three to four years of secondary school. Regarding the population, Finland is about half the size of Sweden with 5,5 million inhabitants compared to 10,3 million.

**Table 1.** Number of schools and pupils

Country	Number of primary schools	Number of pupils (class 1-9, 7-15 y)	Mean number of children per school unit
Finland*	2 333	550 509	235
Sweden**	4 829	1 086 180	225

\* Finnish National Agency for Education, 2018

\*\*Swedish National Agency for Education 2019

## Data

**Table 2, Finland:** Number of reported cases, number admitted in intensive care unit (ICU), number of deaths due to covid-19 and cumulative incidence of reported cases, per June 14, 2020.

Age group (school level)	Number of reported cases	Number admitted in ICU	Number of deaths	Population*	Incidence of reported cases (per 100 000)
1-5 years (day care)	96	0	0	269 246	36
6-15 years (pre- and primary school)	257	0	0	616 516	42
16-19 years (secondary school)	231	1	0	236 199	98
Total 1-19 years	584	1	0	1 121 961	52
Percentage of total number	8.2%	0.3%	0%	20.3%	
Total all ages	7 110	288	320	5 525 292	129

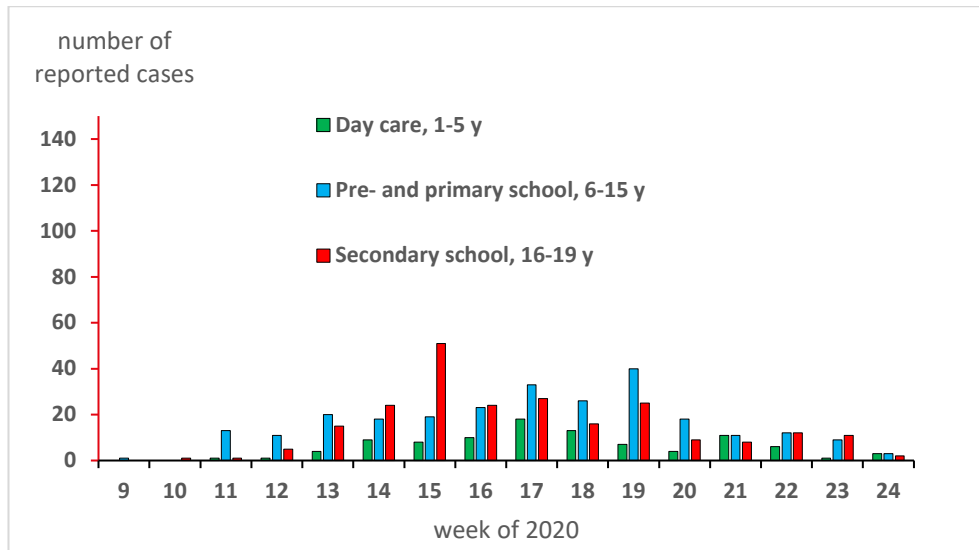
\* Population numbers from Statistics Finland, as reported December 2019

**Table 3, Sweden:** Number of reported cases, number admitted in intensive care unit (ICU), number of deaths due to covid-19 and cumulative incidence of reported cases, per June 14, 2020.

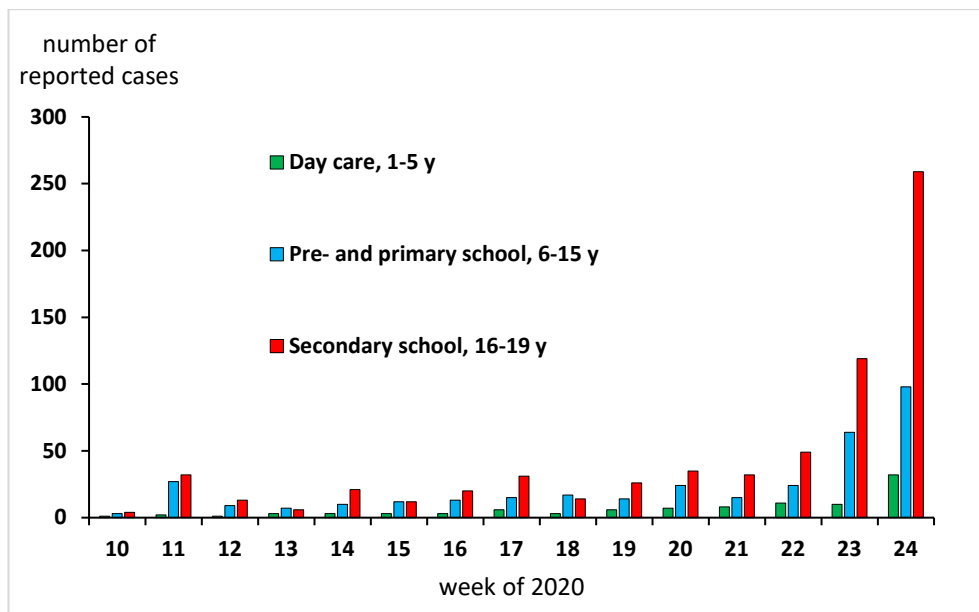
Age group (school level)	Number of reported cases	Number admitted in ICU	Number of deaths	Population*	Incidence of reported cases (per 100 000)
1-5 years (day care)	98	2	0	610 904	16
6 -15 years (pre- and primary school))	370	6	0	1 225 478	30
16-19 years (secondary school)	680	6	0	451 965	150
Total 1-19 years	1124	14	0	2 288 347	49
Percentage of total number	2,1%	0,6%	0%	22.2%	
Total all ages	52 424	2 328	5 051	10 327 589	508

\* Population numbers from Statistics Sweden, as reported November 2019

**Figure 1.** Cases in Finland by age group and week of diagnosis. All schools closed week 12 to week 20. Extended testing started midweek 16.



**Figure 2.** Cases in Sweden by age group and week of diagnosis. Secondary school closed week 12 and extended testing started week 22.



**Table 4, Sweden:** Number of teachers, cases among them and relative risk compared to other professions.

Teachers in	Number of teachers 2019/2020	Number of cases	Median age at diagnosis	Relative risk* (95% CI)
Day care	157 263	192	45	0.9 (0.7-1.1)
Primary school	105 418	160	50	1.1 (0.9-1.3)
Secondary school	30 357	29	47	0.7 (0.5-1)

\* compared to other professions

## Analysis/results

In Finland, primary school closures took place between March 18 and May 13. Primary schools were reopened between May 14 and May 31. During this reopening period, there were 23 primary school exposures (index cases) in 21 primary schools. Of the index cases, 16 were pupils and seven adults. There were 392 pupils and 54 adults placed under quarantine and the last quarantine ended on June 12. The Finnish Institute for Health and Welfare and the Ministry of Education issued restriction guidelines for primary school openings on the 4th of May. A key component of these guidelines was limiting the number of contacts in schools and therefore minimizing the number of possible quarantines. During the period May 14 to June 12 (the end of the last quarantine period), there were no secondary cases in any of the primary schools.

Primary school closure and reopening did not have any significant impact on the weekly number of laboratory-confirmed cases in primary school aged children (**figure 1**).

In Finland, the number of cases in primary school aged children has been less than half of their percentage of the population (**table 2**). In general, the testing guidelines for SARS-CoV-2 have not differed between children and adults and children with symptoms have been tested according to the same protocols as adults. Until April 15, testing was mostly focused on those belonging to risk groups and staff in healthcare. Thereafter testing was encouraged among all suspected cases of covid-19 infection.

The extremely low percentage of SARS-CoV-2 positive children requiring intensive care and no deaths underlines the age-specific pathology of covid-19.

In Sweden, the percentage of reported cases among schoolchildren is only one tenth of their percentage of the population. Also very few cases have been admitted to ICU and there has been no deaths reported in cases aged 1-19 years (**table 3**). **Figure 2** shows the epidemic curve for schoolchildren in Sweden per week where the somewhat higher number week 11 is related to extensive testing of people returning from spring break in Italy. In week 12 testing was limited to cases seeking hospital care. Also in week 12, secondary school and universities switched to on-line teaching, but day care and primary schools remained open. Because of the reduction in testing, contact tracing was limited in most parts of the country and no outbreak investigations performed in schools, missing any opportunity to fill the knowledge gap on the role of children in propagating the epidemic. The increase in number of cases from week 22 coincides with introduction of a more generous testing policy again, testing all with symptoms. In **table 4**, data from Statistics Sweden on individuals and profession was matched with reported cases to get an idea of which professions were overrepresented among reported cases (6). Compared to other professions, the relative risk among teachers in day care, primary and secondary school were close to one, indicating no increased risk of exposure and infection in this group.

The Public Health Agency of Sweden published a report on covid-19 and school children on May 29, summarising the findings and effects of keeping day care and primary schools open in Sweden (7).

## Discussion

Schools have been closed in most countries affected by the pandemic, with the intention to protect children from being infected and to reduce the spread in general. It has been suggested that children may be important in spreading this infection, especially since they usually do not become very ill but still can have a high viral load (8-10).

The overall cumulative incidence among school-aged children in Finland and Sweden is similar even though Finland closed schools for most children and Sweden did not. Sweden has been much more affected by the pandemic than Finland but this does not show in the incidence among children. It is likely that many mild cases in children in Sweden never been detected since testing during week 12 to 22 mainly focused on persons seeking hospital care. By now it is evident that children are much less likely to develop serious disease if they become infected (3, 10, 11), meaning that keeping schools open might be less harmful for children than closing them.

In Sweden, outbreak investigations have been very limited in the regions with the highest number of cases due to strained resources. In the contact tracings in primary schools in Finland, there has been hardly any evidence of children infecting other persons. The Swedish comparison of number of reported cases among staff in day care and primary school to number of cases in other professions does not show any increased risk for teachers. This also indicates that the role of children in propagating this infection is likely to be small. Various papers on contact tracing have also found that children rarely are the first case in family clusters (4, 12, 13).

In the US, a peer reviewed paper has been published suggesting that children might be the best group to target for covid-19 immunization in order to reduce the spread of the virus also to other groups, comparing it with other respiratory infections like influenza and pneumococcal infections (14). This theory is not supported by the findings in our report.

Another study, still only available as a pre-print, finds school closure to be the most effective non-pharmaceutical intervention when looking at a number of countries and different interventions (15). However, as they do point out, it might be a confounded finding as it was one of the first interventions in most countries, thus raising the awareness of the gravity of the situation, which would affect behaviour in general.

## Conclusions

- Closing of schools had no measurable effect on the number of cases of covid-19 among children.
- Children are not a major risk group of the covid-19 disease and seem to play a less important role from the transmission point of view, although more active surveillance and special studies such as school and household transmission studies are warranted.
- The negative effects of closing schools must be weighed against the possible positive indirect effects it might have on the mitigation of the covid-19 pandemic.



## References

1. Masonbrink AR, Hurley E. Advocating for Children During the COVID-19 School Closures. *Pediatrics*. 2020:e20201440.
2. Folkhälsomyndigheten. Vårdpersonalens frånvaro vid skolstängning. The Public Health Agency of Sweden; 2020 2020-04-21.
3. Ludvigsson JF. Systematic review of COVID-19 in children shows milder cases and a better prognosis than adults. *Acta Paediatr*. 2020;109(6):1088-95.
4. Rajmil L. Role of children in the transmission of the COVID-19 pandemic: a rapid scoping review. *BMJ Paediatrics Open*. 2020;4(1):e000722.
5. Ludvigsson JF. Children are unlikely to be the main drivers of the COVID-19 pandemic - A systematic review. *Acta Paediatr*. 2020.
6. Folkhälsomyndigheten. Förekomst av covid-19 i olika yrkesgrupper. The Public Health Agency of Sweden; 2020 2020-06-26.
7. Folkhälsomyndigheten. Covid-19 hos barn och unga – en kunskapssammanställning. The Public Health Agency of Sweden; 2020 2020-05-29.
8. Dattner I, Goldberg Y, Katriel G, Yaari R, Gal N, Miron Y, et al. The role of children in the spread of COVID-19: Using household data from Bnei Brak, Israel, to estimate the relative susceptibility and infectivity of children. *medRxiv*. 2020:2020.06.03.20121145.
9. Han MS, Seong MW, Kim N, Shin S, Cho SI, Park H, et al. Viral RNA Load in Mildly Symptomatic and Asymptomatic Children with COVID-19, Seoul. *Emerg Infect Dis*. 2020;26(10).
10. Zhen-Dong Y, Gao-Jun Z, Run-Ming J, Zhi-Sheng L, Zong-Qi D, Xiong X, et al. Clinical and transmission dynamics characteristics of 406 children with coronavirus disease 2019 in China: A review. *The Journal of infection*. 2020.
11. Hildenwall H, Luthander J, Rhedin S, Hertting O, Olsson-Akefeldt S, Melen E, et al. Paediatric COVID-19 admissions in a region with open schools during the two first months of the pandemic. *Acta Paediatr*. 2020.
12. Cai J, Xu J, Lin D, Yang z, Xu L, Qu Z, et al. A Case Series of children with 2019 novel coronavirus infection: clinical and epidemiological features. *Clinical Infectious Diseases*. 2020.
13. Zhang L, Peres TG, Silva MVF, Camargos P. What we know so far about Coronavirus Disease 2019 in children: A meta-analysis of 551 laboratory-confirmed cases. *Pediatric Pulmonology*.n/a(n/a).
14. Kao CM, Orenstein WA, Anderson EJ. The Importance of Advancing SARS-CoV-2 Vaccines in Children. *Clin Infect Dis*. 2020.
15. Brauner JM, Mindermann S, Sharma M, Stephenson AB, Gavenčiak T, Johnston D, et al. The effectiveness and perceived burden of nonpharmaceutical interventions against COVID-19 transmission: a modelling study with 41 countries. *medRxiv*. 2020:2020.05.28.20116129.

---

The Public Health Agency of Sweden is an expert authority with responsibility for public health issues at a national level. The Agency develops and supports activities to promote health, prevent illness and improve preparedness for health threats. Our vision statement: a public health that strengthens the positive development of society.

**EXHIBIT 10**

# The Importance of Reopening America's Schools this Fall

## The Importance of Reopening America's Schools this Fall

Updated July 23, 2020

### Languages

As families and policymakers make decisions about their children returning to school, it is important to consider the full spectrum of benefits and risks of both in-person and virtual learning options. Parents are understandably concerned about the safety of their children at school in the wake of COVID-19. The best available evidence indicates if children become infected, they are far less likely to suffer severe symptoms.<sup>[1],[2],[3]</sup> Death rates among school-aged children are much lower than among adults. At the same time, the harms attributed to closed schools on the social, emotional, and behavioral health, economic well-being, and academic achievement of children, in both the short- and long-term, are well-known and significant. Further, the lack of in-person educational options disproportionately harms low-income and minority children and those living with disabilities. These students are far less likely to have access to private instruction and care and far more likely to rely on key school-supported resources like food programs, special education services, counseling, and after-school programs to meet basic developmental needs.<sup>[4]</sup>

Aside from a child's home, no other setting has more influence on a child's health and well-being than their school. The in-person school environment does the following:

- provides educational instruction;
- supports the development of social and emotional skills;
- creates a safe environment for learning;
- addresses nutritional needs; and
- facilitates physical activity.

This paper discusses each of these critical functions, following a brief summary of current studies regarding COVID-19 and children.

## COVID-19 and Children

The best available evidence indicates that COVID-19 poses relatively low risks to school-aged children. Children appear to be at lower risk for contracting COVID-19 compared to adults. To put this in perspective, according to the Centers for Disease Control and Prevention (CDC), as of July 17, 2020, the United States reported that children and adolescents under 18 years old account for under 7 percent of COVID-19 cases and less than 0.1 percent of COVID-19-related deaths.<sup>[5]</sup> Although relatively rare, flu-related deaths in children occur every year. From 2004-2005 to 2018-2019, flu-related deaths in children reported to CDC during regular flu seasons ranged from 37 to 187 deaths. During the H1N1 pandemic (April 15, 2009 to October 2, 2010), 358 pediatric deaths were reported to CDC. So far in this pandemic, deaths of children are less than in each of the last five flu seasons, with only 64.<sup>†</sup> Additionally, some children with certain underlying medical conditions, however, are at increased risk of severe illness from COVID-19.\*

Scientific studies suggest that COVID-19 transmission among children in schools may be low. International studies that have assessed how readily COVID-19 spreads in schools also reveal low rates of transmission when community transmission is low. Based on current data, the rate of infection among younger school children, and from students to teachers, has been low, especially if proper precautions are followed. There have also been few reports of children being the primary source of COVID-19 transmission among family members.<sup>[6],[7],[8]</sup> This is consistent with data from both virus and antibody testing, suggesting that children are not the primary drivers of COVID-19 spread in schools or in the community.<sup>[9],[10],[11]</sup> No studies are conclusive, but the available evidence provides reason to believe that in-person schooling is in the best interest of students, particularly in the context of appropriate mitigation measures similar to those implemented at essential workplaces.

Extended school closure is harmful to children. It can lead to severe learning loss, and the need for in-person instruction is particularly important for students with heightened behavioral needs.<sup>[12],[13]</sup> Following the wave of school closures in March 2020 due to COVID-19, academic learning slowed for most children and stopped for some. A survey of 477 school districts by the University of Washington's Center on Reinventing Public Education found that, "far too many schools are leaving learning to chance."<sup>[13]</sup> Just one in three school districts expected teachers to provide instruction, track student engagement, or monitor academic progress for all students, and wealthy school districts were twice as likely to have such expectations compared to low-income districts.<sup>[13]</sup>

We also know that, for many students, long breaks from in-person education are harmful to student learning. For example, the effects of summer breaks from in-person schooling on academic progress, known as "summer slide," are also well-documented in the literature. According to the Northwest Evaluation Association, in the summer following third grade, students lose nearly 20 percent of their school-year gains in reading and 27 percent of their school-year gains in math.<sup>[14]</sup> By the summer after seventh grade, students lose on average 39 percent of their school-year gains in reading and 50 percent of their school-year gains in math.<sup>[14]</sup> This indicates that learning losses are large and become even more severe as a student progresses through school. The prospect of losing several months of schooling, compared to the few weeks of summer vacation, due to school closure likely only makes the learning loss even more severe.

Disparities in educational outcomes caused by school closures are a particular concern for low-income and minority students and students with disabilities. Many low-income families do not have the capacity to facilitate distance learning (e.g. limited or no computer access, limited or no internet access), and may have to rely on school-based services that support their child's academic success. A study by researchers at Brown and Harvard Universities assessed how 800,000 students used Zearn, an online math program, both before and after schools closed in March 2020.<sup>[15]</sup> Data showed that through late April, student progress in math decreased by about half, with the negative impact more pronounced in low-income zip codes.<sup>[15]</sup> Persistent achievement gaps that already existed before COVID-19, such as disparities across income levels and races, can worsen and cause serious, hard-to-repair damage to children's education outcomes.<sup>[15],[16]</sup> Finally, remote learning makes absorbing information more difficult for students with disabilities, developmental delays, or other cognitive disabilities. In particular, students who are deaf, hard of hearing, have low vision, are blind, or have other learning disorders (e.g., attention deficit hyperactivity disorder (ADHD)) and other physical and mental disabilities have had significant difficulties with remote learning.<sup>[17]</sup>

## Social and Emotional Skill Development

Schools play a critical role in supporting the whole child, not just their academic achievement. In addition to a structure for learning, schools provide a stable and secure environment for developing social skills and peer relationships. Social interaction at school among children in grades PK-12 is particularly important for the development of language, communication, social, emotional, and interpersonal skills.<sup>[18]</sup>

Extended school closures are harmful to children's development of social and emotional skills. Important social interactions that facilitate the development of critical social and emotional skills are greatly curtailed or limited when students are not physically in school. In an in-person school environment, children more easily learn how to develop and maintain friendships, how to behave in groups, and how to interact and form relationships with people outside of their family. In school, students are also able to access support systems needed to recognize and manage emotions, set and achieve positive goals, appreciate others' perspectives, and make responsible decisions. This helps reinforce children's feelings of school connectedness, or their belief that teachers and other adults at school care about them and their well-being. Such routine in-person contacts provide opportunities to facilitate social-emotional development that are difficult, if not impossible, to replicate through distance learning.<sup>[18],[19],[20]</sup>

Additionally, extended closures can be harmful to children's mental health and can increase the likelihood that children engage in unhealthy behaviors. An environment where students feel safe and connected, such as a school, is associated with lower levels of depression, thoughts about suicide, social anxiety, and sexual activity, as well as higher levels of self-esteem and more adaptive use of free time.<sup>[19],[20]</sup> A longitudinal study of 476 adolescents over 3 years starting in the 6th grade found school connectedness to be

especially protective for those who had lower connectedness in other areas of their lives, such as home, and to reduce their likelihood of substance use.<sup>[20]</sup>

Further, a review of studies conducted on pandemics found a strong association between length of quarantine and Post Traumatic Stress Disorder symptoms, avoidance behavior, and anger. Another review published this year found that post-traumatic stress scores of children and parents in quarantine were four times higher than those not quarantined.<sup>[21],[22]</sup>

In-person schooling provides children with access to a variety of mental health and social services, including speech language therapy, and physical or occupational therapy to help the physical, psychological, and academic well-being of the child.<sup>[23], [24],[25],[26]</sup> Further, school counselors are trained in the mental health needs of children and youth and can recognize signs of trauma that primary caregivers are less able to see because they themselves are experiencing the same family stresses. School counselors can then coordinate with teachers to implement interventions to offer children a reassuring environment for regaining the sense of order, security, and normalcy.

Without in-person schooling, many children can lose access to these important services. For example, we know that, even outside the context of school closures, children often do not receive the mental health treatment they need. Among children ages 9-17, it is estimated that 21 percent, or more than 14 million children, experience some type of mental health condition.<sup>[27]</sup> Yet only 16 percent of those with a condition receive any treatment.<sup>[23]</sup> Of those, 70-80 percent received such care in a school setting.<sup>[23]</sup> School closures can be particularly damaging for the 7.4 million American children suffering from a serious emotional disturbance. For those individuals who have a diagnosable mental, behavioral or emotional condition that substantially interferes with or limits their social functioning, schools play an integral role in linking them to care and necessary support services.

For children with intellectual or physical disabilities, nearly all therapies and services are received through schools. These vital services are difficult to provide through distance learning models. As a result, more children with disabilities have received few to no services while schools have been closed.

## Safety

Extended school closures deprive children who live in unsafe homes and neighborhoods of an important layer of protection from neglect as well as physical, sexual, and emotional maltreatment and abuse. A 2018 Department of Health and Human Services report found that teachers and other educational staff were responsible for more than one-fifth of all reported child abuse cases—more than any other category of reporter.<sup>[28]</sup> During the COVID-19 school closures, however, there has been a sharp decline in reports of suspected maltreatment, but tragically a notable increase in evidence of abuse when children are seen for services. For example, the Washington, D.C. Child and Family Services Agency recorded a 62 percent decrease in child abuse reporting calls between mid-March and April 2020 compared to the same time period in 2019, but saw more severe presentation of child abuse cases in emergency rooms.<sup>[29]</sup> Children who live in a home or neighborhood where neglect, violence, or abuse occur, but who are not physically in school, are deprived of access to trained school professionals who can readily identify the signs of trauma and provide needed support and guidance.<sup>[30],[31],[32],[33],[34]</sup>

## Nutrition

Extended school closures can be harmful to the nutritional health of children. Schools are essential to meeting the nutritional needs of children with many consuming up to half their daily calories at school. Nationwide more than 30 million children participate in the National School Lunch Program and nearly 15 million participate in the School Breakfast Program.<sup>[35],[36]</sup> For children from low-income families, school meals are an especially critical source of affordable, healthy foods. While schools have implemented strategies to continue meal services throughout periods of school closures, it is difficult to maintain this type of school nutrition program over the long-term. This is a particularly severe problem for the estimated 11 million food-insecure children, living in the United States.

## Physical Activity

When schools are closed, children lose access to important opportunities for physical activity. Many children may not be sufficiently physically active outside of the context of in-school physical education (PE) and other school-based activities. Beyond PE, with schools closed, children may not have sufficient opportunities to participate in organized and safe physical activity. They also lose access to other school-based physical activities, including recess, classroom engagements, and after school programs.

The loss of opportunities for physical activity from school closures, especially when coupled with potentially diminished nutrition, can be particularly harmful to children. Physical inactivity and poor nutrition among children are major risk factors for childhood obesity and other chronic health conditions. Over 75 percent of children and adolescents in the United States do not meet the daily physical activity level recommendations (60 minutes or more), and nearly half exceed 2 hours per day in sedentary behavior. Current models estimate that childhood obesity rate may increase by 2.4 percent if school closures continue to December 2020.<sup>[37],[38],[39]</sup>

## Conclusion

Schools are an important part of the infrastructure of our communities, as they provide safe, supportive learning environments for students, employ teachers and other staff, and enable parents, guardians, and caregivers to work. Schools also provide critical services that help meet the needs of children and families, especially those who are disadvantaged, through supporting the development of social and emotional skills, creating a safe environment for learning, identifying and addressing neglect and abuse, fulfilling nutritional needs, and facilitating physical activity. School closure disrupts the delivery of in-person instruction and critical services to children and families, which has negative individual and societal ramifications. The best available evidence from countries that have opened schools indicates that COVID-19 poses low risks to school-aged children, at least in areas with low community transmission, and suggests that children are unlikely to be major drivers of the spread of the virus. Reopening schools creates opportunity to invest in the education, well-being, and future of one of America's greatest assets—our children—while taking every precaution to protect students, teachers, staff and all their families.

\*Some children have developed multisystem inflammatory syndrome (MIS-C) after exposure to SARS-CoV-2 (the virus that causes COVID-19). (<https://www.cdc.gov/mis-c/cases/index.html>) In one targeted surveillance study for MIS-C associated with SARS-CoV-2, however, the majority of children who were hospitalized with COVID-related MIS-C (70 percent) had recovered by the end date of the study period. (Feldstein LR et al.. Multisystem Inflammatory Syndrome in US Children and Adolescents. *N Engl J Med*. 2020;10.1056/NEJMoa2021680)

†CDC COVID Data Tracker. Available at <https://www.cdc.gov/covid-data-tracker/>. Accessed on July 21, 2020.

## References

1. Zhen-Dong Y, Gao-Jun Z, Run-Ming J, et al. Clinical and transmission dynamics characteristics of 406 children with coronavirus disease 2019 in China: A review [published online ahead of print, 2020 Apr 28]. *J Infect*. 2020;S0163-4453(20)30241-3. doi:10.1016/j.jinf.2020.04.030
2. Choi S-H, Kim HW, Kang J-M, et al. Epidemiology and clinical features of coronavirus disease 2019 in children. *Clinical and experimental pediatrics* 2020;63(4):125-32. doi: <https://dx.doi.org/10.3345/cep.2020.00535> □
3. Coronavirus Disease 2019 in Children — United States, February 12–April 2, 2020. *Morb Mortal Wkly Rep*. 2020;69:422–426.
4. Armitage R, Nellums LB. Considering inequalities in the school closure response to COVID-19. *Lancet Glob Health*. 2020;8(5):e644. doi:10.1016/S2214-109X(20)30116-9
5. CDC COVID Data Tracker. Available at <https://www.cdc.gov/covid-data-tracker/>. Accessed on July 23, 2020.
6. National-Centre-for-immunization-research-and-surveillance. COVID-19 in schools—the experience in NSW, April 26, 2020. Accessed 07/08/2020. Available at: [http://ncirs.org.au/sites/default/files/2020-04/NCIRS%20NSW%20Schools%20COVID\\_Summary\\_FINAL%20public\\_26%20April%202020.pdf](http://ncirs.org.au/sites/default/files/2020-04/NCIRS%20NSW%20Schools%20COVID_Summary_FINAL%20public_26%20April%202020.pdf)
7. Ludvigsson JF. Children are unlikely to be the main drivers of the COVID-19 pandemic – A systematic review [published online ahead of print, 2020 May 19]. *Acta Paediatr*. 2020;10.1111/apa.15371. doi:10.1111/apa.15371
8. Danis K, Epaulard O, Benet T, et al. Cluster of coronavirus disease 2019 (Covid-19) in the French Alps, 2020. *Clinical infectious diseases* : an official publication of the Infectious Diseases Society of America 2020 doi: <https://dx.doi.org/10.1093/cid/ciaa424>

9. World Health Organization (WHO). Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19). 16-24 February 2020. Accessed 07/10/2020. Available at: <https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf>
10. Children and COVID-19. National Institute for Public Health and the Environment, Ministry of Health, Welfare and Sport, The Netherlands. Accessed 07/08/2020. Available at: <https://www.rivm.nl/en/novel-coronavirus-covid-19/children-and-covid-19>
11. Gudbjartsson DF, Helgason A, Jonsson H, et al. Spread of SARS-CoV-2 in the Icelandic Population. *N Engl J Med*. 2020;382(24):2302-2315. doi:10.1056/NEJMoa2006100
12. Dorn E, Hancock B, Sarakatsannis J, Viruleg E. COVID-19 and student learning in the United States: the hurt could last a lifetime. Retrieved July 4, 2020, from <https://www.mckinsey.com/industries/public-sector/our-insights/covid-19-and-student-learning-in-the-united-states-the-hurt-could-last-a-lifetime>.
13. Gross, Bethany (2020) Center for Reinventing Public Education. Too Many Schools leave Learning to Chance During the Pandemic. <https://www.crpe.org/publications/too-many-schools-leave-learning-chance-during-pandemic> Assessed on July 8, 2020.
14. <https://www.nwea.org/blog/2018/summer-learning-loss-what-we-know-what-were-learning/>
15. Chetty, Friedman, Hendren, Stepner, and the Opportunity Insights Team. How Did COVID-19 and Stabilization Policies Affect Spending and Employment? A New Real-Time Economic Tracker Based on Private Sector Data. Opportunity Insights. June 17, 2020. [https://opportunityinsights.org/wp-content/uploads/2020/05/tracker\\_paper.pdf](https://opportunityinsights.org/wp-content/uploads/2020/05/tracker_paper.pdf)
16. Dorn E, Hancock B, Sarakatsannis J, Viruleg E. COVID-19 and student learning in the United States: the hurt could last a lifetime. Retrieved July 4, 2020, from <https://www.mckinsey.com/industries/public-sector/our-insights/covid-19-and-student-learning-in-the-united-states-the-hurt-could-last-a-lifetime>.
17. S. Department of Education, Office of Elementary and Secondary Education, Consolidated State Performance Report, 2017–18. See Digest of Education Statistics 2019.
18. Collaborative for Academic, Social, and Emotional Learning (CASEL). What is SEL? Website. <https://casel.org/what-is-sel/>
19. Foster, C. E., Horwitz, A., Thomas, A., Opperman, K., Gipson, P., Burnside, A., Stone, D. M., & King, C. A. (2017). Connectedness to family, school, peers, and community in socially vulnerable adolescents. *Children and youth services review*, 81, 321–331. <https://doi.org/10.1016/j.chilyouth.2017.08.011>
20. Loukas A, Roalson LA, & Herrera DE (2010). School connectedness buffers the effects of negative family relations and poor effortful control on early adolescent conduct problems. *Journal of Research on Adolescence*, 20(1), 13–22
21. Fegert JM, Vitiello B, Plener PL, and Clemens V. Challenges and Burden of the Coronavirus 2019 (COVID-19) Pandemic for Child and Adolescent Mental Health: A Narrative Review to Highlight Clinical and Research Needs in the Acute Phase and the Long Return to Normality. *Child Adolesc Psychiatry Ment Health*. 2020 May 12;14:20.
22. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. 2020;395(10227):912–920. doi: 10.1016/S0140-6736(20)30460-8.
23. Burns BJ, Costello EJ, Angold A, Tweed D et al. Children’s Mental Health Service Use Across Service Sectors, *Health Affairs*, Vol. 14, No. 3, 1995: 149-159.
24. Return to School During COVID-19, American Academy of Pediatrics, Healthy Children website: <https://www.healthychildren.org/English/health-issues/conditions/COVID-19/Pages/Return-to-School-During-COVID-19.aspx>, Last updated 7/8/2020.
25. Constantino J, Sahin M, Piven J, Rodgers R, and Tschida J. The Impact of COVID-19 on Individuals with Intellectual and Developmental Disabilities: Clinical and Scientific Priorities. *Am J Psychiatry*, submitted.
26. Turk MA, Landes SD, Formica MK, and Goss KD: Intellectual and developmental disability and COVID-19 case-fatality trends: TriNetX analysis. *Disability and Health Journal*. 2020 May 22; [e-pub ahead of print] doi.org/10.1016/j.dhjo.2020.100942.
27. US DHHS. Mental Health: A Report of the Surgeon General, Executive Summary. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, NIH, NIMH, 1999.
28. Department of Health and Human Services (2018) Child Maltreatment 2018 <https://www.acf.hhs.gov/sites/default/files/cb/cm2018.pdf>
29. WUSA (2020) Child abuse is likely going to underreported during the coronavirus pandemic. Here’s what you can do to help.



- 30. Baron, E. Jason and Goldstein, Ezra G. and Wallace, Cullen, Suffering in Silence: How COVID-19 School Closures Inhibit the Reporting of Child Maltreatment (May 14, 2020). Available at SSRN: <https://ssrn.com/abstract=3601399>  or <http://dx.doi.org/10.2139/ssrn.3601399>
- 31. Child Welfare Information Gateway. (2019.) Child maltreatment 2017: Summary of key findings. Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families, Children’s Bureau.
- 32. Campbell, A. (2020). An increasing risk of family violence during the Covid-19 pandemic: Strengthening community collaborations to save lives. Forensic Science International: Reports, 2020 Apr 12. doi: 10.1016/j.fsir.2020.100089
- 33. <https://pediatrics.aappublications.org/content/pediatrics/125/5/1094.full.pdf>
- 34. <https://www.acf.hhs.gov/sites/default/files/cb/cm2017.pdf>
- 35. <https://www.ers.usda.gov/topics/food-nutrition-assistance/child-nutrition-programs/national-school-lunch-program/>
- 36. <https://www.ers.usda.gov/topics/food-nutrition-assistance/child-nutrition-programs/school-breakfast-program/>
- 37. Terry-McElrath, Y. M., O’Malley, P. M., & Johnston, L. D. (2015). Foods and beverages offered in US public secondary schools through the National School Lunch Program from 2011 – 2013: early evidence of improved nutrition and reduced disparities. Preventive Medicine, 78, 52-58.
- 38. Johnson, D. B., Podrabsky, M., Rocha, A., & Otten, J. J. (2016). Effect of the Healthy Hunger-Free Kids Act on the nutritional quality of meals selected by students and school lunch participation rates. JAMA Pediatrics, 170(1), e15391.
- 39. An, R. “Projecting the impact of the coronavirus disease-19 pandemic on childhood obesity in the United States: A microsimulation model. Science. 2020



Last Updated July 23, 2020

Community, Work & School

Community Mitigation Framework

Cleaning & Disinfecting

Businesses & Workplaces

Worker Safety & Support

Schools & Child Care

Colleges & Universities

Parks & Recreational Facilities

Gatherings & Community Events

Community & Faith-Based Organizations

First Responders, Law Enforcement & Public Services

Shared & Congregate Housing

Retirement Communities

Homeless Populations

Correctional & Detention Facilities

Tribal Communities

Guidance Documents

Communication Resources

What's New

Get Email Updates

To receive email updates about COVID-19, enter your email address:

[What's this?](#)

Spanish Resources

[Spanish Communication Resources](#)

[Social Media Toolkit](#)

[Infection Control](#)

[FAQ on Infection Control](#)

**HAVE QUESTIONS?**



Visit CDC-INFO



Call 800-232-4636



Email CDC-INFO



Open 24/7

**CDC INFORMATION**

About CDC

Jobs

Funding

Policies

File Viewers & Players

Privacy

FOIA

No Fear Act

OIG

Nondiscrimination

Accessibility

**CONNECT WITH CDC**



U.S. Department of Health & Human Services

USA.gov

CDC Website Exit Disclaimer

**LANGUAGE ASSISTANCE**

Español

繁體中

Tiếng Việt

Tagalog

Русский

Kreyòl Ayisyen

Français

Polski

Português

Italiano

Deutsch

日本語

English

**EXHIBIT 11**

Network:

ECDC

European Antibiotic Awareness Day

ESCAIDE - Scientific conference

Eurosurveillance journal

LOGIN



Home / Eurosurveillance / Volume 25, Issue 21, 28/May/2020 / Article

**Rapid communication**

**Open Access**

# No evidence of secondary transmission of COVID-19 from children attending school in Ireland, 2020 |

Like 0

Download

Laura Heavey<sup>1,2</sup> , Geraldine Casey<sup>1,2</sup> , Ciara Kelly<sup>1,2</sup> , David Kelly<sup>1,2</sup> , Geraldine McDarby<sup>1,2</sup>

View Affiliations

View Citation

Previous Article | Table of Contents | Next Article



As many countries begin to lift some of the restrictions to contain COVID-19 spread, lack of evidence of transmission in the school setting remains. We examined Irish notifications of SARS-CoV2 in the school setting before school closures on 12 March 2020 and identified no paediatric transmission. This adds to current evidence that children do not appear to be drivers of transmission, and we argue that reopening schools should be considered safe accompanied by certain measures.



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

Comment has been disabled for this content

## Submit your article here

[Submit an Article](#)

## Share



## Tools

- [Add to my favourites](#)
- [Create Publication Alert](#)
- [Create Citation Alert](#)
- [Create Correction Alert](#)
- [Export citation](#)

## News/announcements

The [European Scientific Conference on Applied Infectious Disease Epidemiology \(ESCAIDE\)](#) is going online. Originally planned for Warsaw, Poland, ESCAIDE 2020 will instead take place online from 26 to 27 November. Click [here](#) for more information and for updates.

## News/announcements

The [European Centre for Disease Prevention and Control \(ECDC\)](#) has set up a dedicated webpage for [coronavirus disease \(COVID-19\) updates and risk assessments](#) with a focus on Europe.

Contact the editorial team

Subscription and registration

Submit an article

Data protection

Accessibility

Cookie policy

Disclaimer

Copyright information

Open Access

Sitemap



This site complies with the HONcode standard for trustworthy health information:  
verify here.

Eurosurveillance ISSN 1560-7917  
© 2007 - 2020. All rights reserved



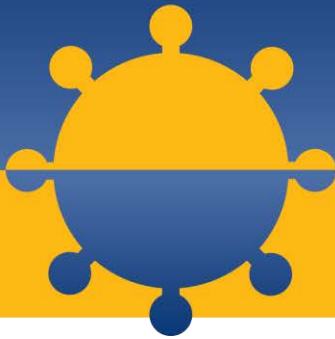
Eurosurveillance is published by the European Centre for Disease Prevention and Control (ECDC),  
Stockholm, Sweden



**EXHIBIT 12**

# Coronavirus COVID-19

BC Centre for Disease Control | BC Ministry of Health



## HOW YOU CAN SLOW THE SPREAD OF COVID-19

Take care of others by taking care of yourself.

Wash your hands, don't touch your face, and stay home if you are sick.

Stay at Home and Physically Distance

Stay at home whenever you can. Maintain 2 meters distance from those outside of your household.

## Caring for Children with COVID-19

April 3, 2020

By Sarah Silverberg (MD) and Laura Sauvé (MD, MPH, FRCPC)

### Key Points

- COVID-19 virus has a very low infection rate in children estimated at 1-5% worldwide.
- The majority of cases in children are the result of a household transmission by droplet spread from another family member with symptoms of COVID-19.
- Children who are infected with the virus and develop COVID-19 have milder symptoms if any, and very few become critically ill.
- Children with COVID-19 illness typically have a fever, dry cough and fatigue. Some may also experience nausea, vomiting, abdominal pain and diarrhea.
- Unlike adults the rates of transmission are unknown. There is no documented evidence of child-to-adult transmission. There are no documented cases of children bringing an infection into the home, from school or otherwise. This is likely the result of the limited number of cases and the mild symptoms in those who do have COVID illness.
- There is no conclusive evidence that children who are asymptomatic pose a risk to other children or to adults.
- There is no evidence indicating children of HCWs are at increased risk of COVID-19 infection than children of non-HCWs. This is likely due to the careful monitoring of HCWs for symptoms and follow-up of their household contacts.
- Like adults, children with any common cold, influenza or COVID-19 like symptoms should stay home and isolate for 10 days following onset of symptoms and until symptoms resolve.
- More research is needed to fully characterize infection, transmission and COVID-19 disease in children.

### COVID-19 Illness in Children

1. Case counts of SARS-CoV2 infection and COVID-19 illness in children are low, representing only 1-5% of confirmed cases worldwide.
2. The severity of disease in children appears to be lower, with only a few documented cases of severe illness and/or death. Younger infants (those <1 year of age) have the highest rates of severe or critical illness.
3. Children are more likely to have few, if any symptoms. Up to 32% of children have been asymptomatic with presumed or confirmed COVID-19.
4. Typically, children with COVID-19 have a fever, dry cough and fatigue. In rare cases, dyspnea and respiratory compromise appear after a week of disease progression. These are associated with systemic symptoms including malaise, restlessness, and poor appetite.



Ministry of Health

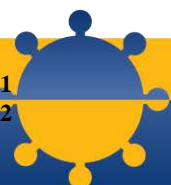


BC Centre for Disease Control

If you have fever, a new cough, or are having difficulty breathing, call 8-1-1.

Non-medical inquiries (ex. travel, physical distancing): 1-888-COVID19 (1888-268-4319) or text 604-630-0300

Exhibit 12



5. Some children experience GI symptoms, including abdominal discomfort, nausea, vomiting, abdominal pain and diarrhea.

### **Children and Infectivity**

1. The majority of children with COVID-19 have a positive household contact.
2. The incubation period in children is approximately two days, with a range of 2-10 days (similar to adults). The mean incubation period between household exposure and pediatric symptom onset is approximately 1 day longer than observed in adult cases.
3. Children typically have negative swabs within 6-22 days of symptom onset, but often not until 2 weeks' time. Children have been found to have high viral loads despite mild symptoms, with prolonged shedding in nasal secretions.
4. As a result of the lower symptom burden, the rates of asymptomatic transmission or transmission with mild symptoms are unknown.
5. There is no documented evidence of child-to-adult transmission of SARS-CoV2. This is different than outbreaks of other viruses such as Influenza where children have been found to have a high rate of infection outside of the household and significant inter-generational transmission.
6. It is unlikely the children of health care workers have more frequent COVID-19 than other children, however, no evidence is available.

### **Recommendations for care for children with suspected or confirmed cases of COVID-19**

1. Children are at a lower risk of developing COVID-19, including developing severe disease. Most children who have COVID-19 can be cared for at home, with supportive care performed by their parents.
2. Children under 1 year of age and those who are immunocompromised or have pre-existing pulmonary conditions are at a higher risk of severe disease.
3. As for all members of the community at this time, children should physically distance themselves as much as possible outside of the family unit.
4. Children, and particularly young children, who develop fever, cough or shortness of breath should be evaluated, as influenza as well as other viral illnesses are still circulating in B.C. Symptomatic children should be cared for using droplet and contact precautions (with airborne precautions if aerosol generating medical procedures are needed).
5. While evidence is limited at this time, children with COVID-19 may shed the virus for longer than adults.

## References

1. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. *JAMA*. 2020.
2. Ludvigsson JF. Systematic review of COVID-19 in children shows milder cases and a better prognosis than adults. *Acta Paediatr*. 2020.
3. Mizumoto K, Omori R, Nishiura H. Age specificity of cases and attack rate of novel coronavirus disease (COVID-19). 2020.
4. Bitnun A, Allen U, Heurter H, King SM, Opavsky MA, Ford-Jones EL, et al. Children hospitalized with severe acute respiratory syndrome-related illness in Toronto. *Pediatrics*. 2003;112(4):e261.
5. Chen ZM, Fu JF, Shu Q, Chen YH, Hua CZ, Li FB, et al. Diagnosis and treatment recommendations for pediatric respiratory infection caused by the 2019 novel coronavirus. *World J Pediatr*. 2020.
6. Sun D, Li H, Lu XX, Xiao H, Ren J, Zhang FR, et al. Clinical features of severe pediatric patients with coronavirus disease 2019 in Wuhan: a single center's observational study. *World J Pediatr*. 2020.
7. Dong Y, Mo X, Hu Y, Qi X, Jiang F, Jiang Z, et al. Epidemiological Characteristics of 2143 Pediatric Patients With 2019 Coronavirus Disease in China. *Pediatrics*. 2020.
8. Su L, Ma X, Yu H, Zhang Z, Bian P, Han Y, et al. The different clinical characteristics of corona virus disease cases between children and their families in China - the character of children with COVID-19. *Emerg Microbes Infect*. 2020;9(1):707-13.
9. Zheng F, Liao C, Fan Q, Chen H, Zhao X, Xie Z, et al. Clinical Characteristics of Children with Coronavirus Disease 2019 in Hubei, China. *Current Medical Science*. 2020;40(2):1-6.
10. Cai JH, Wang XS, Ge YL, Xia AM, Chang HL, Tian H, et al. [First case of 2019 novel coronavirus infection in children in Shanghai]. *Zhonghua Er Ke Za Zhi*. 2020;58(2):86-7.
11. Cruz A, Zeichner S. COVID-19 in Children: Initial Characterization of the Pediatric Disease. *Pediatrics*. 2020.
12. Ogimi C, Englund JA, Bradford MC, Qin X, Boeckh M, Waghmare A. Characteristics and Outcomes of Coronavirus Infection in Children: The Role of Viral Factors and an Immunocompromised State. *J Pediatric Infect Dis Soc*. 2019;8(1):21-8.
13. Cai J, Xu J, Lin D, Yang Z, Xu L, Qu Z, et al. A Case Series of children with 2019 novel coronavirus infection: clinical and epidemiological features. *Clin Infect Dis*. 2020.
14. Xing Y, Ni W, Wu Q, Li W, Li G, Tong J, et al. Prolonged presence of SARS-CoV-2 in feces of pediatric patients during the convalescent phase. 2020.
15. Ma X, Su L, Zhang Y, Zhang X, Gai Z, Zhang Z. Do children need a longer time to shed SARS-CoV-2 in stool than adults? *Journal of Microbiology, Immunology and Infection*. 2020.
16. Gu J, Han B, Wang J. COVID-19: Gastrointestinal manifestations and potential fecal-oral transmission. *Gastroenterology*. 2020.
17. Yeo C, Kaushal S, Yeo D. Enteric involvement of coronaviruses: is faecal-oral transmission of SARS-CoV-2 possible? *The Lancet Gastroenterology & Hepatology*. 2020;5(4):335-7.
18. Chan JF-W, Yuan S, Kok K-H, To KK-W, Chu H, Yang J, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. *The Lancet*. 2020;395(10223):514-23.
19. Kam KQ, Yung CF, Cui L, Lin Tzer Pin R, Mak TM, Maiwald M, et al. A Well Infant with Coronavirus Disease 2019 (COVID-19) with High Viral Load. *Clin Infect Dis*. 2020.
20. Cao Q, Chen YC, Chen CL, Chiu CH. SARS-CoV-2 infection in children: Transmission dynamics and clinical characteristics. *J Formos Med Assoc*. 2020;119(3):670-3.
21. Li Y, Guo F, Cao Y, Li L, Guo Y. Insight into COVID-2019 for pediatricians. *Pediatr Pulmonol*. 2020.

22. Endo A, Uchida M, Kucharski AJ, Funk S. Fine-scale family structure shapes influenza transmission risk in households: Insights from primary schools in Matsumoto city, 2014/15. *PLoS Comput Biol.* 2019;15(12):e1007589.
23. Fong MW, Leung NHL, Xiao J, Chu DKW, Cheng SMS, So HC, et al. Presence of influenza virus on touch-surfaces in kindergartens and primary schools. *J Infect Dis.* 2020.
24. El Guerche-Seblain C, Moureau A, Schiffler C, Dupuy M, Pepin S, Samson SI, et al. Epidemiology and burden of influenza in healthy children aged 6 to 35 months: analysis of data from the placebo arm of a phase III efficacy trial. *BMC Infect Dis.* 2019;19(1):308.
25. Antonova EN, Rycroft CE, Ambrose CS, Heikkinen T, Principi N. Burden of paediatric influenza in Western Europe: a systematic review. *BMC Public Health.* 2012;12(968).

---

April 3, 2020  
Caring for Children with COVID-19 by Dr. S. Silverberg & Dr. L. Sauvé

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF COLLEEN**  
 21 **VICTORY, M.D. IN SUPPORT OF**  
 22 **MOTION FOR PRELIMINARY**  
 23 **INJUNCTION**

Judge: Hon. Dean D. Pregerson

24 **I, COLLEEN (“KELLY”) VICTORY, M.D., declare as follows:**

25 1. I am a physician retained by Plaintiffs to render an expert opinion in this  
 26 action. I make this declaration based on my own personal knowledge. If called as a  
 27 witness, I could and would testify competently to the matters set forth within.

28 2. I have reviewed the court filings provided by Plaintiffs, and the Governor’s  
 orders and public guidance on school closures, and have reached an opinion on the





1 question of safety for children to return to K-12 school in Fall 2020 in the state of  
2 California.

3         3. My training, expertise, and skills qualify me to express the opinions set  
4 forth in this declaration. I am a trauma and emergency physician with a specialty in  
5 disaster preparedness and response, and public health. I have significant post-graduate  
6 training, including the National Preparedness Leadership Initiative program at The  
7 Harvard School of Public Health. I am the President of Victory Health, a consulting  
8 firm focused on driving and supporting meaningful reform and innovation in healthcare.  
9 For the past two decades, I have been in the public health arena advising and working  
10 with large, fortune 100 companies, as well as hospitals, school systems, and  
11 municipalities as they work to develop disaster preparedness and response plans to large  
12 disasters, including hurricanes, earthquakes, school shootings, and pandemics. I  
13 worked with Continental Airlines during the 2002-04 SARS epidemic, advising them  
14 on how to manage and operate their business during the epidemic. I was also the Chief  
15 Medical Officer for Whole Health Management, where I provided clinical direction and  
16 oversight for over 70 on-site clinics and wellness centers across the United States and  
17 Guam.

18         4. Matters of a type reasonably relied upon by experts in my field, to wit,  
19 numerous peer-reviewed studies provided the basis for my opinion. After reviewing the  
20 underlying facts presented by evidence, including studies and reports from the Centers  
21 for Disease Control (CDC), the World Health Organization (WHO), the New England  
22 Journal of Medicine (NEJM), and the American Academy of Pediatrics, I came to the  
23 conclusion that children are essentially at zero risk of contracting COVID-19 or  
24 becoming ill from the virus if schools were to reopen. A recent JAMA Pediatrics study  
25 flatly states: “Our data indicate that children are at far greater risk of critical illness from  
26 influenza than from COVID-19.” If the COVID-19 hazard sets the new standard for health  
27 safety, the country will need to close its schools each year from November until April to  
28 guard against influenza.

1           5.     Keeping schools closed is a huge mistake. The evidence is clear that  
2 children are at extraordinary low-risk of becoming ill from COVID-19—in fact, the risk  
3 is near zero. The children across the country that have become ill or needed  
4 hospitalization, have almost all had significant underlying health conditions. Secondly,  
5 we know that children are unlikely to be a vector, meaning a spreader of COVID-19.  
6 Children carry far less virus—that is, their viral load is significantly less even if they get  
7 the virus; they are estimated to carry about twenty-five percent of what infected adults  
8 carry, so children are very unlikely to spread the virus.

9           6.     On the other hand, the lockdown of the schools and prohibition on  
10 children’s activities has had devastating effects on children and has translated into  
11 significant social issues. School is one of the primary places where child abuse and  
12 neglect are discovered—it’s teachers, not the parents, who make these reports.  
13 Nationwide, there has been a 30% drop in reported cases of child abuse and neglect  
14 since the closure of schools, raising serious concerns about the welfare of children.  
15 Likewise, children’s hearing and vision problems are typically identified at school.  
16 Thus, when we keep kids out of school, we are not only delaying their academic  
17 endeavors, but we are having a profound impact on their mental, social, and physical  
18 health. In addition to the profound impact on children, there is significant economic  
19 impact, as parents are required to stay home with their kids and are therefore unable to  
20 work.

21           7.     Several studies have examined the efficacy of nonpharmaceutical  
22 interventions to mitigate the spread of COVID-19, such as handwashing, mask wearing,  
23 social distancing, respiratory etiquette, washing surfaces. These studies found that all  
24 the nonpharmaceutical measures are not the panacea we were led to believe they would  
25 be. Although these measures all make sense and in theory seem like they should work,  
26 the data are not compelling. While these studies examined influenza and not COVID-  
27 19, both diseases are respiratory illnesses and spread in very much the same way.  
28 There is limited data that we should be doing all of these nonpharmaceutical



1 interventions. A meta-analysis of 10 peer-reviewed studies, posted on the CDC's own  
2 website, concluded that masks-wearing had essentially no meaningful impact on the  
3 spread of a respiratory virus.

4 8. Continuing social distancing and mask wearing is not an appropriate  
5 measure, especially in schools. There are 22 countries that have their schools open  
6 without social distancing, mask wearing, and other mandates, yet these countries have  
7 not experienced an increase in COVID-19 cases or spread of the virus among children.  
8 And, most importantly, these countries have not seen transmission of the virus between  
9 children and their parents or elderly grandparents. Notably, these countries have had  
10 their schools open, not for a few days, but for five or six weeks without seeing  
11 increased spread of COVID-19. If children return to school, as I believe they should,  
12 they should not be required to social distance, wear masks and practice these other  
13 nonpharmaceutical measures.

14 9. With regard to potential risk to teachers, cafeteria staff, custodial staff, etc.,  
15 I believe this can easily be managed. Approximately 56% of public school teachers in  
16 the United States are under the age of 40. 80% are under the age of 55. The percentage  
17 of teachers and staff who fall into the "high-risk" category for COVID-19 is relatively  
18 small, and those individuals can take additional precautions to limit their risk.

19 10. One of the mandates of public health is that we must consider the potential  
20 ramifications of any response or decisions on the overall population, not just on the  
21 individual. The wider impacts must be taken into consideration when you begin to  
22 make broad mandates such as shuttering businesses, closing schools, limiting travel,  
23 etc. Given the extraordinarily low risk of the virus to children, and the small number of  
24 teachers and staff who would fall into the high-risk categories, keeping schools closed  
25 to in-person attendance defies public health logic; we should be isolating the few to  
26 protect the many, not isolating the many to protect the few.

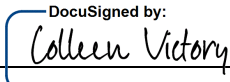
27 11. We know that people over the age of 70, and those who have significant  
28 underlying health conditions, are the most vulnerable to COVID-19. Only 6.5% of the

1 population in the United States is over the age of 65, and the vast majority of these  
2 people aren't in the workforce because of their age. We can easily protect and isolate  
3 the at-risk groups without taking draconian measures like school closures, and certainly  
4 without negatively impacting children in the way that school closures have.

5 12. Re-opening schools is necessary to prevent the devastating effects on our  
6 children that we are currently witnessing. There is no medical basis to require children  
7 to wear masks or social distance and certainly no medical basis for continuing to keep  
8 schools closed. School closures not only have a devastating effect on the economy but  
9 have a profound impact on the social and psychological development of children, which  
10 will only worsen over time if schools are to remain closed.

11  
12 I declare under penalty of perjury under the laws of the United States of  
13 America and the State of California that the foregoing is true and correct.

14  
15  
16 Dated: July 25, 2020

17   
18 \_\_\_\_\_  
19 F9D258FAB3DC49A...  
20 Colleen Victory, M.D.

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF M. KELLY**  
 21 **SUTTON, M.D. IN SUPPORT OF**  
 22 **MOTION FOR PRELIMINARY**  
 23 **INJUNCTION**

Judge: Hon. Dean D. Pregerson

24 **I, M. KELLY SUTTON, M.D., declare as follows:**

25 1. I am a physician practicing in Sacramento County. I have been retained by  
 26 Plaintiffs to render an expert opinion in this action. I make this declaration based on  
 27 my own personal knowledge. If called as a witness, I could and would testify  
 28 competently to the matters set forth herein.



1           2.     I have reviewed the court filings provided by Plaintiffs and have reached  
2 an opinion on the question of safety for children to return to K-12 school in fall 2020 in  
3 the state of California.

4           3.     My training, expertise, and skills qualify me to express the opinions set  
5 forth in this declaration. I am a medical doctor with over forty years' experience in  
6 family practice. I graduated from Marquette University, where I majored in Biology  
7 and English. I then attended medical school at the University of Missouri. I completed  
8 an Internal Medicine internship at the Medical College of South Carolina and my  
9 Residency in Internal Medicine at the Menorah Medical Center. I was named  
10 "outstanding resident" in 1973-74. I also completed a partial residency in pediatrics at  
11 Children's Mercy Hospital. I am certified by the American Board of Internal Medicine.

12           4.     I base my opinions regarding the reopening of schools on my specialized  
13 knowledge and first-hand experience as a physician. This evidence and the underlying  
14 facts brought me to the conclusion that reopening schools poses no risk to children,  
15 while the extreme measures put in place have a significant impact on children.

16           5.     In my practice, I have seen an 8-year-old California student who has  
17 developed phobias and the family is considering leaving the country given the  
18 lockdown measures. The child was formerly well-adjusted in a welcoming classroom  
19 with a wise teacher. Since being isolated at home as an only child, she has become  
20 fearful of going outside and of people in masks among other limiting phobias.  
21 California has made a long-lasting mark on this child's development by depriving her  
22 of school and instilling fear.

23           6.     Several families have opted to leave school settings with inhumane  
24 requirements for children and do the best they can at starting their own alternative  
25 education. This may prove equal to, better than, or worse than prior education  
26 provided, but nonetheless imposes breaking of social bonds and economic restrictions  
27 on families who counted on the educational system to teach children while adults work.  
28 The uprooted children suffer; and the school system undergoes a shockwave.

1 7. I have also seen families in which children essentially receive absolutely  
2 no education when schools are closed, due to single parent requirements to work  
3 combined with lack of inclination or ability to teach.

4 8. Children are being forced home into an online learning environment that  
5 requires them to stare at screens for long periods throughout the day. Staring at  
6 computer screens for extended periods of time has detrimental effects on children's  
7 brains. Indeed, it is known that prolonged screen time affects children's brains,  
8 producing imaging results similar to the brains of people on cocaine and alcohol.

9 10. For these reasons, I believe that there is no medical basis to keep schools  
10 closed and prevent children from receiving in-person instruction; in fact, such extreme  
11 measures are based on faulty science and have caused profound harm to our children.

12  
13 I declare under the penalty of perjury under the laws of the United States of  
14 America and the State of California that the foregoing is true and correct.

15  
16 Dated: July 25, 2020

DocuSigned by:  
M. KELLY SUTTON  
A57AC1FB96DF429...  
Dr. M. Kelly Sutton

**EXHIBIT 13**

**MaryKelly Sutton MD**  
**CA G076932 DEA BS0802858 MA 263141 NPI 1770672230**

**Curriculum Vitae - chronological August 5, 2019**

Born: January 6, 1947, Kansas City MO.  
Family: two sons, born 1983, 1985. Divorced.

College:

Marquette University Milwaukee WI Sept 1964-June 1966  
Honorary English Fraternity, Sigma Tau Delta, Sept 1965-June 66  
Honors Biology course  
National Science Foundation Undergraduate Research Program in Plant  
Physiology summer, 1966  
University of Missouri at Kansas City KCMO Sept 1966-June 1967  
Majors in Biology and English. Accepted into Medical School after three years.

Medical School: University of Missouri School of Medicine Columbia MO  
Sept 1967 - June 1971  
Medical Degree conferred June 1, 1971  
Honors in Psychiatry

Internship: Medical College of South Carolina Charleston SC Sept 1971-August 1972  
Internal Medicine internship, with electives in Obstetrics and Emergency Rm

Residency: Menorah Medical Center KCMO September 1972-August 1974  
Residency in Internal Medicine  
Goppert Award in Gastroenterology Sept 1973-Aug 1974  
Outstanding resident Sept 1973-Aug 1974

Childrens Mercy Hospital KCMO\*  
July through November 1974  
Pediatrics (partial residency)

\* I was allowed to go to Children's Mercy Hosp in July, 1974, as part of my second year residency at Menorah. I did not receive 'credits' for the partial residency at CMH, but if I had chosen to stay longer, I could have become board eligible for pediatrics.

Special training in Anthroposophic Medicine  
Lukas Klinik, Arlesheim, Switzerland  
September - November, 1991

Boards: Certified, American Board of Internal Medicine, June 18, 1974  
Certified by the American College of Anthroposophically-extended Medicine, 1993

**Curriculum vitae, MaryKelly Sutton MD page 2**

Faculty appointments: Clinical Instructor  
Institute of Comparative and Human Toxicology  
Albany Medical College Albany NY at International Center of Environmental Safety  
Holloman AFB NM July 1975 through December 1977  
Clinical Assistant Professor January 1978 to June 1979

Research: Non-human primate neonatology  
Director of the chimpanzee nursery  
International Center of Environmental Safety Holloman AFB NM  
June 1975 to June 1979

Publications: Kelly, M.E., Soike, K., Ahmed, K., and Iatropoulos, M.J.,  
"Coxsackievirus in an infant chimpanzee," *J. Med. Primatol.*, 7:119-121 (1978).

*From November, 1974, until March, 1975, I took time off to spend holidays with my family, travel with my parents, and move from Kansas City to Alamogordo, NM.*

Private Practice:

Alamogordo NM March 1975-June 1979 with admitting privileges at Gerald  
Champion Memorial Hospital, departments of Internal Medicine and Pediatrics  
*From June, 1979, until November, 1979, I took time off, got married, travelled, and moved with my husband from Alamogordo, NM, to Virginia Beach, VA.*

Virginia Beach VA Nov 1979-Jan 1981 with admitting privileges at three hospitals, in  
Departments of Internal Medicine and Pediatrics:  
Leigh Memorial Hospital, Bayside Hospital,  
Chesapeake General Hospital,  
and Childrens Hospital of the Kings Daughters in Pediatrics only.  
I assisted with teaching interviewing skills in Life Cycle Course for first  
year medical students at Eastern Virginia Medical School, Norfolk VA.

Locum tenens: March 1981-March 1983

Employers: Indian Health Service, Comp Health and American Medical International  
Under the Indian Health Service, Aberdeen SD, I served two brief locum tenens in South Dakota  
February - March, 1981.

Under Comp Health, Dr. Therus Kolff MD, Salt Lake City UT, I worked in Marshalltown IA,  
Greenville ME, Farmington NM, Jal NM, in primary care settings, and in Lewistown  
PA for six months in a hospital-based cardiology-oriented Internal Medicine practice.

Under American Medical International, I worked in Saudi Arabia in the department of  
Internal Medicine at King Fahad Hospital, Al Baha KSA for nine months.

Private Practice: June 1983-Nov 1985 Salama Clinic Abu Dhabi, United Arab Emirates Dr.  
Sami Kanderian, employer. Full time outpatient work during most of this time. Children born  
October, 1983 and June, 1985. My husband's job ended, and we returned to the United States.  
*From November, 1985, until March, 1986, I stayed home with the boys and focussed on settling the family after an overseas move.*

Weekend call coverage: March 1986-June 1988 Employers: Robert Rufsvold MD, Lyme NH  
(family practice) and Monadnock Community Hospital, Peterborough NH, (internal medicine).



**Curriculum vitae MaryKelly Sutton MD page 3**

*From June, 1988, until October, 1988, I did not work because the family relocated to another town in New Hampshire.*

Emergency Room and Urgent Care Work: Oct 1988-Sept 1994 Employers: Spectrum Emergency Care (March, 1989 – December, 1995), Brattleboro Memorial Hospital, Keene Clinic, and Valley Regional Hospital.

Private Practice: beginning in Aug 1990 part time in Peterborough NH, increasing to full-time in March 1995 with two locations, Peterborough, and in my Westmoreland home; from 1997, until March, 2004, the practice was located entirely at 103 Roxbury Street, Suite 203, Keene NH.

I closed the practice in 2004, and moved to Prescott, AZ.

Consulting and educating (part-time private practice): June, 2004 - June 2005, in Prescott, AZ and Fair Oaks, CA.

Locum tenens with CompHealth: June 20, 2005 - September 23, 2005, at Mascoma Valley Community Care Center, Rt 4, Enfield, NH 03748 (now closed), and Alice Peck Day Hospital, 125 Mascoma Street, Lebanon, NH 03766.

Chapa De Indian Health Service (part-time employee), Grass Valley, CA: January 2006 - January 2007.

Raphael Association (part-time employee), Fair Oaks, CA: December 2005 - August 2008.

Private practice, half-time: Raphael Medicine & Therapies PC 9801 Fair Oaks Blvd Suite 300, Fair Oaks CA 95628, (916) 671-1780: September 2008 – present.

Locum tenens part-time December 26, 2014 – February 20, 2015, working at Livingston Community Health Center, in Livingston, CA.

November, 2018, moved to Rhode Island to be grandma to my first grandchild. Home address: 494 Woonasquatucket Ave #221, North Providence RI 02911.

Private practice part-time Raphael Medicine East, PC, Lydian Center, 777 Concord Ave #301, Cambridge MA 01238. February 2019 – present.

**PROFESSIONAL MEMBERSHIPS current**

Physicians for Informed Consent  
Physicians Association for Anthroposophic Medicine  
Round Table Discussion Group Mederi Center

**Curriculum vitae MaryKelly Sutton MD page 4**  
INSTITUTIONAL AFFILIATIONS

Gerald Champion Memorial Hospital 1209 9th Street Alamogordo NM 88310 Ph: 505-439-2100 F: 505-439-2386	1975-1979
Bayside Hospital PO Box 5695 Independence Blvd Virginia Beach VA Ph: 757-363-6196	1979-1980
Leigh Memorial Hospital 600 Gresham Drive Norfolk VA 23507 Ph: 757-668-3481 F: 757-466-6379	1979-1980
Chesapeake General Hospital 736 Battlefield Blvd North Chesapeake VA 23320 Ph: 757-547-8121 F: 757-482-6184	1979-1980
Childrens Hospital of the Kings Daughters 601 Childrens Lane Norfolk VA 23507 Ph: 757-668-7032 F: 757-668-9775	1979-1980
Hospitals in Jal NM, Lewistown PA, Greenville ME, Marshall IA as locum tenens under employ of CompHealth, Salt Lake City, UT	1981-1982
King Fahad General Hospital Al Baha, Kingdom of Saudia Arabia Supervisors: Dr. Tom Atkins and Dr. Maynard Jacobson	June 1982- March 1983
New Medical Center (outpatient) Abu Dhabi, United Arab Emirates	1983-1985
Monadnock Community Hospital Old Street Road Forsell and Garhart Peterborough, NH 03458 Ph: 603-924-7191 F: 603-924-9586	1988 weekend coverage for Drs. included admitting/ICU privileges
The Cheshire Medical Center 570 Court Street Keene NH 03431 Ph: 603-352-4111 Emergency Medicine Department	1989-1995 part-time

as employee of Spectrum Emergency Care

**Curriculum vitae MaryKelly Sutton MD page 5**

March, 1989 – December, 1995  
Active Staff Internal Medicine February, 1999  
-April, 2002.  
Courtesy Staff Internal Medicine April, 2002  
- April, 2003  
Ph: 800-325-3982 F: 314-919-8931

Keene Clinic Urgent Care Center 1989-1990 (approx)  
590 Court Street part-time  
Keene NH 03431  
Ph: 603-357-3411 F: 603-355-8472

Whispering Pines (later Seafield Pines) 1990-1991 (approx)  
Rt 9 Keene NH 03431 part-time  
Keene NH 03431 (now closed)  
admitting history, physical, orders, and call coverage

Seminole Point Hospital (now closed) 1990-1991 (approx)  
Lake Sunapee NH part-time  
admitting history, physical, orders, and call coverage

Valley Regional Hospital 1993  
243 Elm Street part-time  
Claremont NH 03743  
Ph: 603-542-7771 F: 603-542-1815  
work at Newport UCC, Newport NH

Spofford Hall (now closed) 1991-1993 (approx)  
Spofford NH part-time  
admitting history, physical, orders, and call coverage

The Cheshire Medical Center Active Staff Internal Medicine February,  
1999-  
580 Court Street -April, 2002.  
Keene NH 03431 Courtesy Staff Internal Medicine April, 2002  
- April, 2003 February 1999 to Feb 2003

Otter Brook Center 2000 to 2002  
Route 9  
Keene, NH 03431  
medical coverage for adolescent substance abuse rehab

**Curriculum vitae MaryKelly Sutton MD page 6**

MEDICAL LICENSES Mary Kelly Sutton MD

State	Number	Issued	Expiration	Status
California	G076932	2/7/04	6/21/93 1/31/16	1/31/97 Active
Massachussetts	263141	12/3/15	1/06/21	Active
Arizona	33767	2/10/05	1/6/07	Inactive
New Hampshire Inactive	7451	10/2/86	8/3/06	
Vermont Inactive	42-0007877		12/07/88	11/30/90
New York Inactive	150168		5/28/82	----
Pennsylvania Inactive	MD-026167E		12/15/81	12/31/82
Maine Inactive	10939		8/12/82	1986
Iowa Inactive	687 Temporary	6/1/81		6/2/82
Virginia Inactive	30751		7/30/79	1/31/86
New Mexico Inactive	75-059		1975	1986
Missouri Inactive	33488		6/26/71	1/31/85

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
**THE CENTRAL DISTRICT OF CALIFORNIA**

14 **MATTHEW BRACH, et al.**  
 15  
 16 Plaintiffs,  
 17 v.  
 18 **GAVIN NEWSOM, et al.**  
 19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

**DECLARATION OF RICHARD**  
**ADDISON IN SUPPORT OF**  
**MOTION FOR PRELIMINARY**  
**INJUNCTION**

Judge: Hon. Dean D. Pregerson

**I, RICHARD ADDISON, declare as follows:**

20  
 21  
 22  
 23 1. I am a resident of Riverside county, California and am an educational  
 24 psychologist retained by Plaintiffs to render an expert opinion in this action. I make this  
 25 declaration based on my own personal knowledge. If called as a witness, I could and  
 26 would testify competently as follows.  
 27  
 28



1           2.     I have reviewed the court filings provided by Plaintiffs and have reached  
2 an opinion on the question of long-term effects school closures will have on the  
3 developing brains of children.

4           3.     My training, expertise, and skills qualify me to express the opinions set  
5 forth in this declaration. I am an educational psychologist at Southern California  
6 Psycho-Educational Services. I obtained my Doctorate in Psychology from Alliant  
7 International University. I earned my master's in educational psychology from Azusa  
8 Pacific University. I am a diplomate in school neuropsychology, and I am a member of  
9 the American Board of School Neuropsychology. I am also a school psychologist at  
10 Temecula Valley USD. I am a member of the American Psychological Association.  
11 Having worked as an educator for the past nineteen years and the last thirteen as a  
12 school psychologist, I have a unique perspective on learning styles and neurocognitive  
13 functioning.

14           4.     I specialize in school neuropsychological and general assessments that  
15 focus on the whole child. I routinely evaluate children for suspected learning  
16 disabilities, including dyslexia, dyscalculia, and dysgraphia. I also evaluate social-  
17 emotional and attention regulation. Additionally, I offer consultation about ecological  
18 changes to assist in the student's educational progress.

19           5.     I base my opinion on my own professional experience and knowledge, as  
20 well as medical research. Relying on this evidence led me to conclude that the  
21 reopening of schools is necessary to prevent children's brain development from being  
22 significantly inhibited.

23           6.     Research shows that the developing brains of children, particularly  
24 children from disadvantaged, low socioeconomic communities and children with  
25 special needs are particularly at risk.

26           7.     Developing brains need guided stimulation for effective neural pathways to  
27 be established. These pathways through a biological process will ultimately make  
28 synapses. Synapses are communication sites where neurons pass nerve impulses among

1 themselves. This process facilitates learning. Experiences that are provided through  
2 the back and forth interactions among teachers, students, and peers determine whether  
3 these synapses are strengthened or weakened. If these experiences are inconsistent or  
4 interrupted, synaptic pruning will occur and impede ultimate development. The process  
5 of synaptic pruning is the process by which the brain eliminates synapses that are either  
6 under-used or irrelevant; hence the phrase, “use it or lose it,” applies.

7 8. A child’s experiences during the earliest years of life have a lasting  
8 influence on the architecture of the developing brain. Genes provide the basic  
9 blueprint, but experiences provide the process that determines whether a child’s brain  
10 will create a strong or weak foundation for all future learning, behavior, and health.  
11 During this important period of brain development billions of brain cells called neurons  
12 send electrical signals to communicate with each other forming circuits that become the  
13 foundation of lightning fast pathways that facilitate learning with a well-developed  
14 brain. This ultimate development happens with consistent and repeated use. Structured  
15 and guided experiences within a stimulating educational environment are critical in  
16 providing the child with the best course for ultimate growth and development.

17 9. In this critical, developmental process, neurons form strong connections  
18 for emotions, motor skills, language, behavioral control, logic, and memory. With  
19 repeated use, the circuits become more efficient and connect to other areas of the brain.  
20 What comes first forms the foundation for all that comes later.

21 10. Additionally, experts now widely regard the time between kindergarten  
22 and first grade as the critical window for providing early intervention services to  
23 children with dyslexia. Studies show that when children receive services during this  
24 window, reading and achievement gaps diminish significantly or disappear altogether.  
25 When children do not receive intervention services until third grade or later, they have a  
26 more difficult time catching up, which exacerbates the reading gap over time. As an  
27 educational psychologist with years of experience, I can attest to the fact that the type of  
28

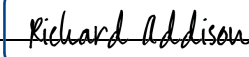
1 interventions necessary to facilitate growth would be difficult, if not impossible, to  
2 achieve online.

3 11. All children are at risk of cognitive-developmental difficulties as well as  
4 adaptive and social-emotional difficulties from being denied the experiences that can  
5 only be effectively provided with face-to-face interactions with a skilled educator  
6 within an educational environment, and with interactions with peers. Data supports that  
7 children who come from disadvantaged families and children with learning disabilities  
8 are at much greater risk, because many parents from these households are not qualified  
9 to provide even minimally adequate stimulation to replace the experiences in the school  
10 setting.

11 12. Reopening the schools is necessary to provide students with the adequate  
12 social interactions and brain stimulation to ensure proper brain development. Without  
13 in-person instruction, children’s brain development will be harmed. Safely opening  
14 schools should be the number one priority of the country. Our children’s brain  
15 development is at stake.

16 I declare under penalty of perjury under the laws of the United States of America  
17 and the State of California that the foregoing is true and correct.

18  
19 Dated: July 27, 2020

DocuSigned by:  
  
B98BE6885D7E46C...  
Dr. Richard Addison



1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF MARI BARKE**  
 21 **IN SUPPORT OF MOTION FOR**  
 22 **PRELIMINARY INJUNCTION**

Judge: Hon. Dean D. Pregerson

23 I, MARI BARKE, declare as follows:

24 1. I am a citizen of the United States. I have personal knowledge of the  
 25 facts set forth in this declaration. If called as a witness, I could and would testify  
 26 competently to the matters set forth herein.

27 2. I was elected to the Orange County Board of Education in June 2018 to  
 28 represent the second district.



1           3.       On June 24, 2020, the Board held a meeting to receive written and oral  
2 testimony from families and teachers in the district. The Board heard from an expert  
3 panel consisting of physicians, psychiatrists, and school educators on the viability of  
4 reopening schools.

5           4.       After the meeting, the Executive Committee of the Orange County Board  
6 of Education prepared a white paper with alternative recommendations to those  
7 proposed by the State of California for the reopening of schools.

8           5.       On July 13, 2020, the Board held a special meeting to decide whether to  
9 adopt the white paper. During this meeting, the Board heard oral testimony from  
10 members of the public. The Board voted 4-1 to adopt the white paper. Attached as  
11 Exhibit 14 is a true and correct copy of the white paper the Board adopted on July 13,  
12 2020.

13           6.       After listening to all the evidence presented to the Orange County Board of  
14 Education, I personally believe that the risk of harm to the education, physical well-  
15 being, and mental health of most students, and to the community in general of closing  
16 schools this fall significantly exceeds the minimal risk of harm to students, their  
17 families, teachers, and the community if schools resume in-person classes. I also  
18 believe that there are much less draconian risk-mitigation measures that can be taken to  
19 protect uniquely vulnerable individuals than a continuing prohibition on in-person  
20 education in our county and state.

21           7.       As I made clear during the board meetings, I do not believe that any  
22 student, teacher, or staff member should be compelled to attend classes at this time. I  
23 believe that the decision as to when students, teachers, and staff return to school should  
24 be a decision they make individually. It is my opinion that the school districts should  
25 provide options for everyone so that everyone can make the best decision for their  
26 family based upon their individual needs.

27

28

1 I declare under penalty of perjury under the laws of the United States of America  
2 and the State of California that the foregoing is true and correct.

3  
4 Dated: July 26, 2020

DocuSigned by:

*mari barke*

5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
Mari Barke

6CE819D2753E4FE...

**EXHIBIT 14**

# Orange County Board of Education



Orange County Department of Education  
200 Kalmus  
Costa Mesa, CA

## White Paper

### Special Community Forum on “Opening Schools in Orange County”

#### Recommendations for the Safe and Effective Reopening of Orange County Schools

Adopted and approved by the Orange County Board of Education on July 13, 2020.

#### Forum Moderator

Will Swaim, President, California Policy Center

#### Expert Panelists

Steven Abelowitz, M.D., Clayton Chau, M.D., Simone Gold, M.D., Michael Eilbert, M.D., Mike Fitzgibbons, M.D., Mark MacDonald, M.D., Sherry Kropp, Ph.D., Joel Kotkin, Larry Sand, Michael A. Shires, Hon. Don Wagner

## Table of Contents

Preface	Page 3
Introduction	Page 5
General Recommendations	Pages 5-6
Community Fear And Future Governance Decisions	Page 12
On Distance Learning	Page 12
Summary	Page 13
Appendix A-Expert Panel Biography	Page 15
Appendix B- <i>U.S. Centers for Disease Control and Prevention "Schools during the Covid-19 pandemic,"</i>	Page 18
Appendix C- American Academy of Pediatrics Guidelines	Page 19
Appendix D- Orange County Covid-19 Cases and Deaths by Age	Page 34
Appendix E- <a href="#">A Blueprint for Back to School.</a> The American Enterprise Institute	Page 35
Appendix F- Southern California Chapter American Academy of Pediatric Statement	Page 36

**\*The OCBE acknowledges and appreciates Mr. Will Swaim assistance and input in the preparation of this document.**

## PREFACE

California public schools are critical community institutions with civic responsibilities that often move far beyond teaching. For many families, public schools also provide crucial childcare and recreation needs as well as important mental health care and nutritional needs.

Public school employees frequently function as front-line detectors and reporters of child abuse and neglect issues. The shutdown of our schools has not diminished these risks to children; abuse doesn't stop merely because reporting from teachers is halted. Indeed, as one expert told us, children "are the silent casualties of this lockdown." For too many children, our schools are a refuge from a difficult, even violent world, and now that refuge is closed. Dr. Sherry Kropp stated, "We have hurt hundreds of thousands more children than we have helped." Orange County District Attorney Todd Spitzer predicts, *"One of the things we're going to learn after this pandemic is over is that by having people sheltered at home, we have potentially put children and elderly people closer to their abusers."*

There are reasonable arguments on all sides about whether this is the best and highest outcome for our school system, or why we often fall short of the high education standards we set for ourselves. But this is not the place for that debate. Here, we accept what is: that parents of school-age children – and children themselves – have come to rely on our schools. Deprived of these institutions even for a short time, children have lost valuable instruction. Many American communities have been plunged into social and economic chaos.

Therefore, the Orange County Board of Education concludes that it is not acceptable to delay the opening of public schools as it is not in the best interests of our children and families. Further, it is not clear that an effective cure or a vaccination for *SARS-CoV-2 infection* (Covid-19) will be developed in the near future if at all.

Declaring this in the face of widely held misconceptions and mixed messages about Covid-19 – particularly about its lethality and contagiousness to children – requires fact-finding and courage, as we

move through these uncertainties together. The American Academy of Pediatrics reported the following in late June <sup>1</sup>:

*“Although many questions remain, the preponderance of evidence indicates that children and adolescents are less likely to be symptomatic and less likely to have severe disease resulting from Covid-19 infection. In addition, children may be less likely to become infected and to spread infection. Policies to mitigate the spread of COVID-19 within schools must be balanced with the known harms to children, adolescents, families, and the community by keeping children at home.”*

We recognize that this conclusion is dramatically and significantly different from some common misconceptions about the disease. It was a conclusion that our panelists – and many in the medical community – reached long before the AAP released its recommendations. For that reason, we asked these experts to attend a special June 2020 special community forum at the Orange County Department of Education’s Costa Mesa office. Each board member had the opportunity to place an expert of choice on the panel, and the board approved the resulting expert panel at its regular board meeting.

The OCBE special board public meeting on June 24, 2020 on reopening schools in Orange County followed the governor’s current guidelines on social distancing. Members of the public were allowed to attend in person on a space-available basis, and we simultaneously made it possible for the public to attend the live-streamed meeting with more than 1,000 attendees. Hundreds of on-line listeners submitted questions and comments for discussion. And though we certainly could not answer all of the questions submitted, the experts’ discussion, feedback, and conclusions provided a general response to all.

The board received both support and criticism to the stated mission and purpose of the meeting. Observers of the meeting saw evidence that the public and parents are eager to participate in the conversation on reopening schools. The purpose of the board’s public dialogue is to provide transparent, open discussions for interested parents and community members, which are often in contrast with decision-making processes of other federal, state and local government agencies on the same subject. For instance, the board’s community public forum and meeting reflected great

<sup>1</sup> <https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/covid-19-planning-considerations-return-to-in-person-education-in-schools/>



transparency in contrast to the county superintendent’s task force and meetings. In creating guidelines, this task force utilized community healthcare experts and primarily unelected school administrators in which the public and elected county department trustees were prevented from attending or participating. The subsequently released superintendent task force guidelines on re-opening schools, “Orange County Together”<sup>2</sup>, is available for review on-line.

In this white paper, we have done our best to capture the general assessment of the various expert opinions. And, of course, some panelists were careful to say that they were speaking only for themselves and not necessarily for all colleagues or organizations with which they work in their professional capacities (see e.g. Appendix A.).

## **INTRODUCTION**

Our schools were closed in March 2020 in order to meet what state officials said was the short-term goal of “flattening the curve,” that is to slow the spread of Covid-19. Many of our panel experts said that decisions made to halt the spread of the virus by federal, state, and local government entities was reasonable at the time, given the general lack of knowledge about this novel infectious disease and evolving epidemic/pandemic. But continuing the shutdown despite new science and data, our experts said, has been a mistake with disastrous implications for children, their families and community. It hardly goes without saying that poorer families with fewer options, and families with special-needs children, have suffered most from the shutdown.

The current knowledge of this virus and its virulence has given science and medicine much information and knowledge to make reasonable public health policy, recommendations, and guidelines. More efficacious data and science will inform our knowledge of Covid-19 over time and guidelines will be continually adapted as we learn more about how to best live in the COVID-19 era.

### **General recommendations**

What we know to date allows us to offer the following guidelines:

<sup>2</sup> <https://newsroom.ocde.us/orange-county-together-guide-provides-recommendations-for-safely-reopening-local-schools/>

- K-12 children represent the lowest-risk cohort for Covid-19. Because of that fact, social distancing of children and reduced census classrooms is not necessary and therefore not recommended.
- Requiring children to wear masks during school is not only difficult – if not impossible to implement – but not based on science. It may even be harmful and is therefore not recommended.
- Children play a very minor role in the spread of Covid-19. Teachers and staff are in greater danger of infection from other adults, including parents, than from students in their classrooms.
- Participation in any reopening of public education should be voluntary. These guidelines are not “laws” or “regulations” or even “rules.” Parents, not government officials, are in the best position to determine the education environment that best suits their children. If a school district is unable or unwilling to provide that education, parents should be allowed to send their children to a district or charter school that will provide that education. Some parents with the means will opt for private schools or home schooling.
- Temperature checks should be performed regularly. As with any illness, ill children, teachers, or staff should be sent home and if identified not allowed to be on campus.
- As always, good hygiene with frequent hand washing and the use of hand sanitizer should be encouraged.
- Classrooms, meeting rooms, transportation vehicles (e.g., busses) and administrative offices should be thoroughly cleaned each night

Our goal is to provide parents, teachers, schools trustees, administrators and other stakeholders with evidence following the CDC’s and the Academy of American Pediatrics’ simple, common-sense guidelines that will allow us to reopen our schools safely this fall – and that our schools must reopen.

The general use of the U.S. Centers for Disease Control and Prevention (Appendix B-Schools during the Covid-19 pandemic,) and the American Academy of Pediatrics (Appendix C- COVID-19 Planning Considerations: Guidance for School Re-entry) is prudent reference for policy makers.

***K-12 children represent the lowest risk cohort for Covid-19. Because of that fact, social distancing and masking of children is unnecessary and therefore not recommended.***

There's no question that children generally represent the lowest risk cohort for Covid-19. The American Academy of Pediatrics concludes <sup>3</sup> :

*SARS-CoV-2 appears to behave differently in children and adolescents than other common respiratory viruses, such as influenza, on which much of the current guidance regarding school closures is based. Although children and adolescents play a major role in amplifying influenza outbreaks, to date, this does not appear to be the case with SARS-CoV-2. Although many questions remain, the preponderance of evidence indicates that children and adolescents are less likely to be symptomatic and less likely to have severe disease resulting from SARS-CoV-2 infection. In addition, children may be less likely to become infected and to spread infection. Policies to mitigate the spread of COVID-19 within schools must be balanced with the known harms to children, adolescents, families, and the community by keeping children at home.*

Similarly, weeks before the Pediatric Academy's publication, the *Journal of the American Medical Association* reported, "it is important to emphasize that the overall burden of COVID-19 infection in children remains relatively low compared with seasonal influenza." <sup>4</sup>

As of June 24, 2020 the Orange County Healthcare Agency reported that residents under the age of 24 (38 percent of the population) accounted for just 15 percent of all Covid-19 cases and no Orange County deaths (Appendix D - "Orange County Covid-19 Cases and Deaths by Age). By contrast, individuals over the age of 75 (just 13.5 percent of the population) accounted for 56 percent of all deaths. As one of our experts on the panel put it, "This is a disease that kills our most elderly and spares our children. It may sound callous, but would we want it the other way around?"

The importance of vital social interaction among children is well-documented and is indeed foundational to American K-12 education. Social distancing and mandatory masking have been found to be more harmful to children than previously thought. An American Enterprise Institute working group notes <sup>5</sup>:

*"The isolation brought about by social distancing can exacerbate children's depression and anxiety. As students return, schools must have counseling support to address the numerous*

<sup>3</sup> <https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/covid-19-planning-considerations-return-to-in-person-education-in-schools/>

<sup>4</sup> <https://jamanetwork.com/journals/jamapediatrics/fullarticle/2766037>

<sup>5</sup> <https://www.aei.org/wp-content/uploads/2020/05/A-Blueprint-for-Back-to-School.pdf>

*causes of trauma that result from the deaths of friends and family members, economic hardship from a parent losing his or her job, or abuse, violence, or neglect” (Appendix E, “[A Blueprint for Back to School](#),”).*

Indeed, our expert panelists expressed the same concerns about the lockdown’s impact on our children’s health. Dr. Sherry Kropp, recently retired superintendent of Los Alamitos Unified School District, summed up the conclusions of many on this issue: In closing our schools, *“we have hurt hundreds of thousands more children than we have helped.”*

Our professional educators and other support staff do not need to be reminded when and how to look for signs of psychological or mental health distress, including distress caused by social distancing, among our students and colleagues. Because of the established link between social-distancing and child harm, we cannot support extraordinary efforts aimed at social-distancing at school.

There’s a complementary form of social-distancing that’s often recommended or even required in other guidelines on school-reopening, that is considered just as unwise as social-distancing itself, i.e., the use of masks by children. The argument that children should wear masks to prevent the asymptomatic spread of the coronavirus to other students or a high-risk teacher or administrator is fallacious and lacks science and data to support this notion.

Requiring children to wear face coverings may even be very harmful to the child. Learning is inhibited and critical social interactions among students and between student and teacher are fractured. Mandatory masks may well lead to a spike in childhood behavior problems such as learning disabilities, anxiety disorders, and depression to name a few.

Responding to guidelines published by our colleagues in the Los Angeles Unified School District, Dr. Alice Kuo, President of the Southern California chapter of the American Academy of Pediatrics, opined <sup>6</sup>:

*“Our concern is that recently issued guidelines for schools re-opening in Los Angeles County are not realistic or even developmentally appropriate for children. For example, wearing masks throughout the day can hinder language and socio-emotional development, particularly for*

<sup>6</sup> <http://aapca2.org/wp-content/uploads/2020/06/AAP-CA2-press-release-on-schools-re-opening-6-2-20-Rev.pdf>

*younger children.” (Appendix F)*

It’s important to note masks that are effective in preventing disease by viral contagions require formal certified instruction and training. Health professionals are generally experienced and fitted properly with personal protective equipment (PPE), and sophisticated masks that are properly fitted to the individual by a thirty minute test and process called “fit testing.” That’s not the case with children and adults who currently are using inadequate filtering cloth or medical-surgical grade masks. According to the US. Department of Labor-Occupational Safety and Health Administration <sup>7</sup>, *“cloth face coverings are not considered personal protective equipment (PPE)”*, and surgical masks *“will not protect the wearer against airborne transmissible infectious agents due to lose fit and lack of adequate seal or inadequate filtration.”*

*“Medical-surgical grade masks can be worn to contain the wearer’s respiratory droplets (e.g., healthcare workers, such as surgeons, wear them to avoid contaminating surgical sites, and dentists and dental hygienists wear them to protect patients).”* Additionally, medical-surgical masks should be used by infected individuals to decrease the transmission of respiratory infections that spread by large Covid-19 droplets <sup>8</sup>. Pragmatically, as our panel of pediatric and medical experts iterated, the use of mask by children is unnatural and difficult to enforce. Prolong face mask during the schools day use will inevitably contribute to the increase frequency of children touching their faces and constantly adjusting their masks, thereby potentially increasing the rate of contaminating their hands and face coverings.

Future prevention by vaccines that are tested and approved by the FDA will not available for some future undefined time period. The Covid-19 virus will be a global endemic disease for the next generations until herd immunity or a vaccination is available. As the world advances its knowledge and medical science on the Covid-19 virus, we currently do not have any data or evidence of the effectiveness in preventing Covid infections in children and adults by the mandatory use of masks.

<sup>7</sup> <https://www.osha.gov/SLTC/covid-19/covid-19-faq.html#testing>

<sup>8</sup> Ibid

The only evidence and data available on mask effectiveness against viruses are studies from the analysis of the 2009 pandemic Influenza (H1N1) virus. Cowling in his meta-analysis study<sup>9</sup> of 279 citations and 12 articles found by PubMed search, concluded there is “*limited evidence base supporting the efficacy or effectiveness of face masks to reduce influenza virus transmission*”. Likewise, bin-Reza PubMed database search concluded in his meta-analysis study<sup>10</sup> that none of the “*studies reviewed established a conclusive relationship between mask/respirator use and protection against influenza infection.*” There is a paucity of studies and data that does not support the use of masks to prevent becoming infected with Covid-19. In the future months and years ahead perhaps meta-analysis studies and data will reveal more information on mask effectiveness in preventing disease.

Future Covid-19 prevention in both adults and children by vaccines that are tested and approved by the FDA will not be available for an undefined time period. The Covid-19 virus will be a global endemic disease for the next generations until herd immunity or a vaccination is available. Because children represent such a negligible risk for reasons unknown but with data and science supporting this notion, we cannot recommend masking children or social distancing. Indeed, we would ask those who advocate such requirements to respond to the medical evidence that masks and social distancing actually inhibit learning.

***Children play a very minor role in the spread of Covid-19. Teachers and staff are in greater danger from one another – from all other adults, including parents – than from children.***

If our neighbors are surprised that children are not vectors for Covid-19, it may come as a greater shock that many nonprofit childcare centers have remained open throughout the pandemic – even in New York City, the nation’s hotspot for viral spread. National Public Radio reports<sup>11</sup>:

*“Throughout the pandemic, many child care centers have stayed open for the children of front-line workers — everyone from doctors to grocery store clerks. YMCA of the USA and New York City’s Department of Education have been caring for, collectively, tens of thousands of children since March, and both tell NPR they have no reports of coronavirus clusters or outbreaks. As*

<sup>9</sup> [Cowling, BJ., et. al., \*Race Masks to Prevent Transmission of Influenza Virus: A Systematic Review\*. \*Epidemiol. Infect.\* \(2010\), 138, 489-456](#)

<sup>10</sup> [bin-Reza, F., et.al., \*The Use of Masks And Respirators to Prevent Transmission Of Influenza: A Systematic Review Of The Scientific Evidence\*.](#)

<sup>11</sup> <https://www.npr.org/2020/06/24/882316641/what-parents-can-learn-from-child-care-centers-that-stayed-open-during-lockdowns>

*school districts sweat over reopening plans, and with just over half of parents telling pollsters they're comfortable with in-person school this fall, public health and policy experts say education leaders should be discussing and drawing on these real-world child care experiences."*

A researcher from Brown university <sup>12</sup> similarly found as of June 24, 2020, the day of our hearing, that "916 childcare centers serving more than 20,000 children, just over 1% of staff and 0.16% of children were confirmed infected with the coronavirus." Thus, indicating preliminary data and observations from childcare centers reflects low transmission capacity by children.

Data increasingly supports the conclusion that children are a very low risk of Covid-19 infection and are also not likely to transmit the disease along to adults. We therefore recommend that adults – including teachers, staff, parents – consider guidelines from the American Academy of Pediatrics (AppendixC)

***Participation in any reopening of public education is voluntary. Parents, not government officials or a group of health experts, are in the best position to determine the education that best suits their children. If a school district is unable or unwilling to provide that education, parents will be allowed to send their children to a district or charter school that will provide that education.***

Perhaps our most important recommendation is based on the principle of individual choice – both for the families of our students and, to the extent possible, for select employees. Though it is important that we reopen our schools, some parents and some employees may reasonably question their own fitness for a fall return. We understand that multigenerational families, for instance, or families in which children or adults live with maladies that make them more vulnerable might feel safe at home. It's important that school districts accommodate these choices to the best of their ability.

Similarly, parents must be granted the freedom to move – must be assisted in moving – to any other school that serves their interests. Our goal is to see to the continued education of our children, not to produce a top-down, centralized approach that assumes all families make this important decision in the same way.

<sup>12</sup> <https://watson.brown.edu/taubman/news/2020/what-parents-can-learn-child-care-centers-stayed-open-during-lockdown-emily-oster-cited>

## **COMMUNITY FEAR AND FUTURE GOVERNANCE DECISIONS**

Among the many compelling expert arguments for reopening our schools, a number of us were also struck by something different, something we might call advice for adults. Several panelists – policy experts and medical doctors – admonished us to remember that the data is clear, but data should not penetrate fear. Among our greatest responsibilities as adults is our responsibility to model courage and persistence in the face of uncertainty and fear, which is what many families are feeling with the mixed messages and confusion surrounding reopening of schools in the COVID-19 era.

Among these panel experts at the June 24, 2020 special board meeting, Dr. Mark McDonald, a psychiatrist who specializes in children and at-risk youth, may have summed it up best:

*“Children are not dying from Covid-19. Children are not passing the disease on to adults. So the only question is, “Why are we even having this meeting tonight?” We’re meeting because we adults are afraid.*

*As parents, we will face many moments of anxiety: seeing our children off on their first day of kindergarten, their first day of camp, their first year of college. We may want to keep them home to protect them from the world, which can indeed be a frightening place. But let’s be clear, when we do that, we are not really protecting our children. We are only attempting to manage our own anxiety, and we do that at their expense. We are acting as negligent parents. We are harming our children. We are failing them.*

*We must agree to make decisions in the best interest of the children. If we do not – if, paralyzed by fear, we continue to act purely out of self-interest – we will ensure an entire generation of traumatized young adults, consigned to perpetual adolescence and residency in their parents’ garages, unable to move through life with independence, courage, and confidence. They deserve better — we owe it to them as parents.”*

## **ON DISTANCE LEARNING**

While a thorough discussion of distance learning is beyond the scope of this discussion, it’s important to note that it appears so far to have been an utter failure. Abandoning the classroom in favor of computer-based learning proved frustrating to all – not just parents and students but teachers, too.



The move has revealed huge class-based disparities in access to technology. It produced irregular attendance by children, and teachers simply (generally through no lack of effort) unable to manage distracted children in multiple locations. Its reliance on parental oversight is also a fatal weakness. With good reason, virtually every major newspaper report has declared the experiment a failure. Here are just a few of the many reports:

- [Los Angeles Times, "With the coronavirus keeping campuses closed, parents report academic, financial struggles and stress"](#) <sup>13</sup>
- [Sacramento Bee, "Moving California schools online was difficult. Imagine doing it without fast internet or laptops"](#) <sup>14</sup>
- [San Diego Union-Tribune, "Some schools are pulling the plug on distance learning"](#) <sup>15</sup>
- [Wall Street Journal, "The Results Are In for Remote Learning: It Didn't Work"](#) <sup>16</sup>
- [Zocalo Public Square, "I deserve a 'A' for flunking my kids' distance learning"](#) <sup>17</sup>

### Summary

The Orange County Board of Education held a community public forum on reopening schools in Orange County with varied responses from constituents. The board's experts presented evidence that strongly supports opening schools in the fall as it is critical to the well-being of our children, families, and communities. The intent of the board was to demonstrate and provide expert opinions and science-based data that can be considered by local school trustees and superintendents when making policies for reopening schools in their district. K-12 children represent the lowest-risk cohort for Covid-19, and children play a very minor role in the spread of Covid-19 to adults. Evidence shows that teachers and staff are in greater danger of contracting a Covid-19 infection from other adults in the teachers' lounge than from students in their classrooms.

The findings of this forum are reflected in these guidelines:

- Social distancing of children and reduction of classroom size and census may be considered, but not vital to implement for school aged children.
- Requiring children to wear masks during school is not only difficult, but may even be harmful over time.

<sup>13</sup> <https://www.latimes.com/california/story/2020-05-18/la-schools-distance-learning-students-survey>

<sup>14</sup> <https://www.sacbee.com/news/local/education/article241799591.html>

<sup>15</sup> <https://www.sandiegouniontribune.com/news/nation-world/story/2020-05-14/some-us-schools-are-pulling-the-plug-on-distance-learning>

<sup>16</sup> <https://www.wsj.com/articles/schools-coronavirus-remote-learning-lockdown-tech-11591375078>

<sup>17</sup> <https://www.zocalopublicsquare.org/2020/05/12/distancing-learning-covid-19-education-students-parents-broken-system/ideas/connecting-california/>

- Participation in any reopening of public education should be voluntary. These guidelines are not “laws” or “regulations” or even “rules.” Parents are in the best position to determine the education environment that best suits their children rather than government officials.
- If a school district is unable or unwilling to reopen schools in a manner that resumes a typical classroom environment and school atmosphere, parents should be allowed to send their children to another school district or charter school that will provide that preferred education. In fact, many parents stated they will opt for private schools or home schooling if their child does not have a typical interactive academic classroom environment.
- Temperature checks should be performed regularly. As with any active disease or illness, children, teachers, or staff suspected of having an acute respiratory illness should be sent home and if identified not allowed to be on campus if testing and medical evaluation is performed.
- As always, good hygiene with frequent hand washing and the use of hand sanitizer is encouraged.
- Classrooms, meeting rooms, transportation vehicles (e.g., busses) and administrative offices should be thoroughly cleaned each night.
- Ongoing surveillance and coordination with county public health is encouraged.

## Appendix A-Community Forum Expert Panelists

**Dr. Steven Abelowitz** is past Pediatric Department Chair, Hoag Memorial Hospital Presbyterian. He is board certified in Pediatric Medicine and Medical Director of Coastal Kids Pediatric Medical Group in Newport Beach, Irvine, Laguna Niguel, and Ladera Ranch. Among other credentials and honors, Dr Abelowitz is a fellow of the American Academy of Pediatrics and board certified in Pediatric Medicine.

**Dr. Clayton Chau** is the director of the OC Health Care Agency, having worked for the agency's Behavioral Health Services team from 1999-2012. He was most recently Chief Clinical and Strategy Officer for Mind OC, the not-for-profit created to support the advancement of Be Well OC. Dr. Chau received his PhD in Clinical Psychology from Chelsea University in 2004, and his medical degree from the University of Minnesota in 1994. He completed his psychiatry residency at the University of California, Los Angeles/San Fernando Valley followed by a fellowship with the National Institute of Mental Health in psychoneuroimmunology focusing on substance use disorder and HIV. Dr. Chau has conducted international trainings in the areas of health care integration, health care system reform, cultural competency and mental health policy.

**Dr. Michael Eilbert** is a hospitalist and pulmonologist practicing medicine in Newport's Hoag Memorial Hospital Presbyterian. He has been in private practice for more than 20 years in Orange County. In this pandemic, Dr. Eilbert is actively involved in the treatment and care of acute Covid-19 positive patients. He is a member of the Board of Directors of the Orange County Medical Association (OCMA) and president elect to OCMA.

**Dr. Mike Fitzgibbons** is a hospitalist and an Infectious Disease specialist practicing medicine in central Orange County for over three decades. He is on staff at St. Joseph Hospital in Orange. A graduate of Georgetown Medical School, Dr. Fitzgibbons completed his residency and fellowship at UC Irvine Medical Center. In the current pandemic, Dr. Fitzgibbons is actively involved in the treatment and care of acute Covid-19 -positive patients. He is an expert on infectious pathogens and their associated morbidity and mortality. Dr. Fitzgibbons is a delegate to the California Medical Association and active in public policy on health and medical issues with the Orange County Medical Association.

**Dr. Simone Gold** is a board-certified emergency physician in Los Angeles, California. She graduated from Chicago Medical School before attending Stanford University Law School to earn her Juris Doctorate degree. She completed her residency in Emergency Medicine at Stony Brook University Hospital in New York. Dr. Gold has had a life-long interest in health policy, and worked in Washington D.C. for the former Surgeon General, as well as for the Chairman of the Labor & Human Resources Committee. She has also worked as a physician advisor determining inpatient or outpatient status, and as a physician-attorney advocate for hospital-clients with Medicare and Medicaid appeals. She is a published author and editor of several magazine and newspaper articles.

**Joel Kotkin** is the Presidential Fellow in Urban Futures at Chapman University in Orange, California and Executive Director of the Houston-based Urban Reform Institute. He is Senior Advisor to the Kem C. Gardner Policy Institute. Kotkin has recently completed several studies including on urbanism, the future of localism, the changing role of transit in America and most recently California's lurch towards feudalism. He is co-author, with Michael Lind, on a report published in 2018 on the revival of the American Heartland for the Center for Opportunity Urbanism. As director of the Center for Demographics and Policy at Chapman University, he was the lead author of a major study on housing, and recently, with Marshall Toplansky, published a strategic analysis for Orange County.

**Sherry Kropp PhD** served in Orange County's Los Alamitos Unified School District since 1985 and was superintendent from 2011 until her retirement in 2019. A graduate of Orange County schools, she began her teaching career in 1978 as an English, math, and biology teacher and coach in Washington state before returning to Southern California. Before she was named Superintendent of Los Alamitos Unified School District, Dr. Kropp was a teacher, assistant principal, and interim principal at Los Alamitos High School, a principal at a continuation high school, and a director and assistant superintendent in the district. She has a bachelors degree in English, masters in Educational Administration, and a doctorate in Educational Leadership.

**Dr. Mark McDonald** is a double board-certified child and adolescent psychiatrist in private practice in Los Angeles. He studied classical cello and world literature at UC Berkeley before beginning medical training at the Medical College of Wisconsin. He completed his adult psychiatry residency at the University of Cincinnati and child psychiatry fellowship at Harbor-UCLA in Los Angeles. He specializes in working with children with autism and trauma, as well as obsessive-compulsive and bipolar disorders. He is a candidate in psychoanalysis at the Psychoanalytic Center of California (PCC).

**Larry Sand** is an education policy expert with an insider's view: he began teaching in New York in 1971, and, in 1985, taught elementary school as well as English, math, history and ESL in the Los Angeles Unified School District, where he also served as a Title 1 Coordinator. Retired but not retiring, he is the president of the nonprofit [California Teachers Empowerment Network](#) (CTEN), a nonpartisan group dedicated to providing teachers with reliable and balanced information about professional affiliations and positions on education issues. In 2011, realizing that parents, taxpayers and others frequently receive faulty information from the mainstream media, CTEN expanded its mission to help the general public understand the array of educational issues facing our country today.

**Michael A. Shires, Ph.D** is associate dean for strategy and special projects and an Associate Professor at Pepperdine University School of Public Policy. Shires has a long record of success finding new strategies and solutions to problems across a wide range of organizations, from small and mid-sized businesses to nonprofit organizations and think tanks to local communities and governments. Over 25 years, he has worked extensively with new organizations with line responsibility for developing management and educational systems. Dr. Shires has published extensively on state and local government finance in California, K-12 education policy and

higher education policy. His research includes not only the nuts and bolts of state and local governance and finance, but also the ethics and politics of decision-making at these levels

**Orange County Supervisor Don Wagner** was re-elected to the Third Supervisorial district seat in March 2020, and has served as an elected leader in Orange County for over 24 years. He represents nearly 600,000 residents in Orange County's Third District (Anaheim Hills, Irvine, Orange, Tustin, North Tustin, Villa Park, Yorba Linda, and the unincorporated canyons). A practicing attorney, he has also served as a community college district trustee, state legislator, and mayor of Irvine from 2016 – 2019.

## APPENDIX B -U.S. Centers for Disease Control and Prevention-“Schools during the Covid-19 pandemic,”

### SCHOOLS DURING THE COVID-19 PANDEMIC



The purpose of this tool is to assist administrators in making (re)opening decisions regarding K-12 schools during the COVID-19 pandemic. It is important to check with state and local health officials and other partners to determine the most appropriate actions while adjusting to meet the unique needs and circumstances of the local community.

#### Should you consider opening?

- ✓ Will reopening be consistent with applicable state and local orders?
- ✓ Is the school ready to protect children and employees at **higher risk** for severe illness?
- ✓ Are you able to screen students and employees upon arrival for symptoms and history of exposure?

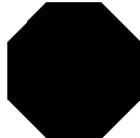
ANY NO



#### Are recommended health and safety actions in place?

- ✓ Promote healthy hygiene practices such as hand washing and employees wearing a cloth face covering, as feasible
- ✓ Intensify cleaning, disinfection, and ventilation
- ✓ Encourage social distancing through increased spacing, small groups and limited mixing between groups, if feasible
- ✓ Train all employees on health and safety protocols

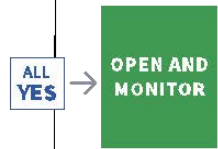
ANY NO



#### Is ongoing monitoring in place?

- ✓ Develop and implement procedures to check for signs and symptoms of students and employees daily upon arrival, as feasible
- ✓ Encourage anyone who is sick to stay home
- ✓ Plan for if students or employees get sick
- ✓ Regularly communicate and monitor developments with local authorities, employees, and families regarding cases, exposures, and updates to policies and procedures
- ✓ Monitor student and employee absences and have flexible leave policies and practices
- ✓ Be ready to consult with the local health authorities if there are cases in the facility or an increase in cases in the local area

ANY NO



[cdc.gov/coronavirus](https://cdc.gov/coronavirus)

## APPENDIX C-American Academy of Pediatrics Guidelines

# COVID-19 Planning Considerations: Guidance for School Re-entry

[Critical Updates on COVID-19](#) / [Clinical Guidance](#) / COVID-19 Planning Considerations: Guidance for School Re-entry

The purpose of this guidance is to support education, public health, local leadership, and pediatricians collaborating with schools in creating policies for school re-entry that foster the overall health of children, adolescents, staff, and communities and are based on available evidence. Schools are fundamental to child and adolescent development and well-being and provide our children and adolescents with academic instruction, social and emotional skills, safety, reliable nutrition, physical/speech and mental health therapy, and opportunities for physical activity, among other benefits. Beyond supporting the educational development of children and adolescents, schools play a critical role in addressing racial and social inequity. As such, it is critical to reflect on the differential impact SARS-CoV-2 and the associated school closures have had on different races, ethnic and vulnerable populations. These recommendations are provided acknowledging that our understanding of the SARS-CoV-2 pandemic is changing rapidly.

Any school re-entry policies should consider the following key principles:

- School policies must be flexible and nimble in responding to new information, and administrators must be willing to refine approaches when specific policies are not working.
- It is critically important to develop strategies that can be revised and adapted depending on the level of viral transmission in the school and throughout the community and done with close communication with state and/or local public health authorities and recognizing the differences between school districts, including urban, suburban, and rural districts.
- Policies should be practical, feasible, and appropriate for child and adolescent's developmental stage.
- Special considerations and accommodations to account for the diversity of youth should be made, especially for our vulnerable populations, including those who are medically fragile, live in poverty, have developmental challenges, or have special health care needs or disabilities, with the goal of safe return to school.
- No child or adolescent should be excluded from school unless required in order to adhere to local public health mandates or because of unique medical needs. Pediatricians, families, and schools should partner together to collaboratively identify and develop accommodations, when needed.
- School policies should be guided by supporting the overall health and well-being of all children, adolescents, their families, and their communities. These policies

should be consistently communicated in languages other than English, if needed, based on the languages spoken in the community, to avoid marginalization of parents/guardians who are of limited English proficiency or do not speak English at all.

With the above principles in mind, **the AAP strongly advocates that all policy considerations for the coming school year should start with a goal of having students physically present in school.** The importance of in-person learning is well-documented, and there is already evidence of the negative impacts on children because of school closures in the spring of 2020. Lengthy time away from school and associated interruption of supportive services often results in social isolation, making it difficult for schools to identify and address important learning deficits as well as child and adolescent physical or sexual abuse, substance use, depression, and suicidal ideation. This, in turn, places children and adolescents at considerable risk of morbidity and, in some cases, mortality. Beyond the educational impact and social impact of school closures, there has been substantial impact on food security and physical activity for children and families.

Policy makers must also consider the mounting evidence regarding COVID-19 in children and adolescents, including the role they may play in transmission of the infection. SARS-CoV-2 appears to behave differently in children and adolescents than other common respiratory viruses, such as influenza, on which much of the current guidance regarding school closures is based. Although children and adolescents play a major role in amplifying influenza outbreaks, to date, this does not appear to be the case with SARS-CoV-2. Although many questions remain, the preponderance of evidence indicates that children and adolescents are less likely to be symptomatic and less likely to have severe disease resulting from SARS-CoV-2 infection. In addition, children may be less likely to become infected and to spread infection. Policies to mitigate the spread of COVID-19 within schools must be balanced with the known harms to children, adolescents, families, and the community by keeping children at home.

Finally, policy makers should acknowledge that COVID-19 policies are intended to mitigate, not eliminate, risk. No single action or set of actions will completely eliminate the risk of SARS-CoV-2 transmission, but implementation of several coordinated interventions can greatly reduce that risk. For example, where physical distance cannot be maintained, students (over the age of 2 years) and staff can wear face coverings (when feasible). In the following sections, we review some general principles that policy makers should consider as they plan for the coming school year. For all of these, education for the entire school community regarding these measures should begin early, ideally at least several weeks before the start of the school year.

## Physical Distancing Measures



Physical distancing, sometimes referred to as social distancing, is simply the act of keeping people separated with the goal of limiting spread of contagion between individuals. It is fundamental to lowering the risk of spread of SARS-CoV-2, as the primary mode of transmission is through respiratory droplets by persons in close proximity. There is a conflict between optimal academic and social/emotional learning in schools and strict adherence to current physical distancing guidelines. For example, the Centers for Disease Control and Prevention (CDC) recommends that schools "space seating/desks at least 6 feet apart when feasible."

In many school settings, 6 feet between students is not feasible without limiting the number of students. Evidence suggests that spacing as close as 3 feet may approach the benefits of 6 feet of space, particularly if students are wearing face coverings and are asymptomatic. Schools should weigh the benefits of strict adherence to a 6-foot spacing rule between students with the potential downside if remote learning is the only alternative. Strict adherence to a specific size of student groups (e.g., 10 per classroom, 15 per classroom, etc.) should be discouraged in favor of other risk mitigation strategies.

Given what is known about transmission dynamics, adults and adult staff within schools should attempt to maintain a distance of 6 feet from other persons as much as possible, particularly around other adult staff. For all of the below settings, physical distancing by and among adults is strongly recommended, and meetings and curriculum planning should take place virtually if possible. In addition, other strategies to increase adult-adult physical distance in time and space should be implemented, such as staggered drop-offs and pickups, and drop-offs and pickups outside when weather allows. Parents should, in general, be discouraged from entering the school building. Physical barriers, such as plexiglass, should be considered in reception areas and employee workspaces where the environment does not accommodate physical distancing, and congregating in shared spaces, such as staff lounge areas, should be discouraged.

The recommendations in each of the age groups below are not instructional strategies but are strategies to optimize the return of students to schools in the context of physical distancing guidelines and the developmentally appropriate implementation of the strategies. Educational experts may have preference for one or another of the guidelines based on the instructional needs of the classes or schools in which they work.

### **Pre-Kindergarten (Pre-K)**

In Pre-K, the relative impact of physical distancing among children is likely small based on current evidence and certainly difficult to implement. Therefore, Pre-K should focus on more effective risk mitigation strategies for this population. These include hand hygiene, infection prevention education for staff and families, adult physical distancing from one another, adults wearing face coverings, cohorting, and spending time outdoors.

*Higher-priority strategies:*

- Cohort classes to minimize crossover among children and adults within the school; the exact size of the cohort may vary, often dependent on local or state health department guidance.
- Utilize outdoor spaces when possible.
- Limit unnecessary visitors into the building.

*Lower-priority strategies:*

- Face coverings(cloth) for children in the Pre-K setting may be difficult to implement.
- Reducing classmate interactions/play in Pre-K aged children may not provide substantial COVID-19 risk reduction.

### **Elementary Schools**

*Higher-priority strategies:*

- Children should wear face coverings when harms (e.g., increasing hand-mouth/nose contact) do not outweigh benefits (potential COVID-19 risk reduction).
- Desks should be placed 3 to 6 feet apart when feasible (if this reduces the amount of time children are present in school, harm may outweigh potential benefits).
- Cohort classes to minimize crossover among children and adults within the school.
- Utilize outdoor spaces when possible.

*Lower-priority strategies:*

- The risk reduction of reducing class sizes in elementary school-aged children may be outweighed by the challenge of doing so.
- Similarly, reducing classmate interactions/play in elementary school-aged children may not provide enough COVID-19 risk reduction to justify potential harms.

### **Secondary Schools**

There is likely a greater impact of physical distancing on risk reduction of COVID in secondary schools than early childhood or elementary education. There are also different barriers to successful implementation of many of these measures in older age groups, as the structure of school is usually based on students changing classrooms. Suggestions for physical distancing risk mitigation strategies when feasible:

- Universal face coverings in middle and high schools when not able to maintain a 6-foot distance (students and adults).
- Particular avoidance of close physical proximity in cases of increased exhalation (singing, exercise); these activities are likely safest outdoors and spread out.

- Desks should be placed 3 to 6 feet apart when feasible.
- Cohort classes if possible, limit cross-over of students and teachers to the extent possible.
  - Ideas that may assist with cohorting:
    - Block schedule (much like colleges, intensive 1-month blocks).
    - Eliminate use of lockers or assign them by cohort to reduce need for hallway use across multiple areas of the building. (This strategy would need to be done in conjunction with planning to ensure students are not carrying home an unreasonable number of books on a daily basis and may vary depending on other cohorting and instructional decisions schools are making.)
    - Have teachers rotate instead of students when feasible.
    - Utilize outdoor spaces when possible.
    - Teachers should maintain 6 feet from students when possible and if not disruptive to educational process.
    - Restructure elective offerings to allow small groups within one classroom. This may not be possible in a small classroom.

## **Special Education**

Every child and adolescent with a disability is entitled to a free and appropriate education and is entitled to special education services based on their individualized education program (IEP). Students receiving special education services may be more negatively affected by distance-learning and may be disproportionately impacted by interruptions in regular education. It may not be feasible, depending on the needs of the individual child and adolescent, to adhere both to distancing guidelines and the criteria outlined in a specific IEP. Attempts to meet physical distancing guidelines should meet the needs of the individual child and may require creative solutions, often on a case-by-case basis.

## **Physical Distancing in Specific Enclosed Spaces**

### **Bussing**

- Encourage alternative modes of transportation for students who have other options.
- Ideally, for students riding the bus, symptom screening would be performed prior to being dropped off at the bus. Having bus drivers or monitors perform these screenings is problematic, as they may face a situation in which a student screens positive yet the parent has left, and the driver would be faced with leaving the student alone or allowing the student on the bus.
- Assigned seating; if possible, assign seats by cohort (same students sit together each day).
- Tape marks showing students where to sit.

- When a 6-foot distance cannot be maintained between students, face coverings should be worn.
- Driver should be a minimum of 6 feet from students; driver must wear face covering; consider physical barrier for driver (e.g., plexiglass).
- Minimize number of people on the bus at one time within reason.
- Adults who do not need to be on the bus should not be on the bus.
- Have windows open if weather allows.

## **Hallways**

- Consider creating one-way hallways to reduce close contact.
- Place physical guides, such as tape, on floors or sidewalks to create one-way routes.
- Where feasible, keep students in the classroom and rotate teachers instead.
- Stagger class periods by cohorts for movement between classrooms if students must move between classrooms to limit the number of students in the hallway when changing classrooms.
- Assign lockers by cohort or eliminate lockers altogether.

## **Playgrounds**

Enforcing physical distancing in an outside playground is difficult and may not be the most effective method of risk mitigation. Emphasis should be placed on cohorting students and limiting the size of groups participating in playground time. Outdoor transmission of virus is known to be much lower than indoor transmission.

## **Meals/Cafeteria**

School meals play an important part in addressing food security for children and adolescents. Decisions about how to serve meals must take into account the fact that in many communities there may be more students eligible for free and reduced meals than prior to the pandemic.

- Consider having students cohorted, potentially in their classrooms, especially if students remain in their classroom throughout the day.
- Create separate lunch periods to minimize the number of students in the cafeteria at one time.
- Utilize additional spaces for lunch/break times.
- Utilize outdoor spaces when possible.
- Create an environment that is as safe as possible from exposure to food allergens.
- Wash hands or use hand sanitizer before and after eating.

## **Cleaning and Disinfection**

The main mode of COVID-19 spread is from person to person, primarily via droplet transmission. For this reason, strategies for infection prevention should center around this form of spread, including physical distancing, face coverings, and hand hygiene. Given the challenges that may exist in children and adolescents in effectively adhering

to recommendations, it is critical staff are setting a good example for students by modeling behaviors around physical distancing, face coverings and hand hygiene. Infection via aerosols and fomites is less likely. However, because the virus may survive in certain surfaces for some time, it is possible to get infected after touching a virus contaminated surface and then touching the mouth, eyes, or nose. Frequent handwashing as a modality of containment is vital.

Cleaning should be performed per established protocols followed by disinfection when appropriate. Normal cleaning with soap and water decreases the viral load and optimizes the efficacy of disinfectants. When using disinfectants, the manufacturers' instructions must be followed, including duration of dwell time, use of personal protective equipment (PPE), if indicated, and proper ventilation. The use of EPA approved disinfectants against COVID-19 is recommended ([EPA List N](#)). When possible, only products labeled as [safe for humans and the environment](#) (e.g., Safer or Designed for the Environment), containing active ingredients such as hydrogen peroxide, ethanol, citric acid, should be selected from this list, because they are less toxic, are not strong respiratory irritants or asthma triggers, and have no known carcinogenic, reproductive, or developmental effects.

When EPA-approved disinfectants are not available, alternative disinfectants such as diluted bleach or 70% alcohol solutions can be used. Children should not be present when disinfectants are in use and should not participate in disinfecting activities. Most of these products are not safe for use by children, whose "hand-to-mouth" behaviors and frequent touching of their face and eyes put them at higher risk for toxic exposures. If disinfection is needed while children are in the classroom, adequate ventilation should be in place and nonirritating products should be used. Disinfectants such as bleach and those containing quaternary ammonium compounds or "Quats" should not be used when children and adolescents are present, because these are known respiratory irritants.

In general, elimination of high-touch surfaces is preferable to frequent cleaning. For example, classroom doors can be left open rather than having students open the door when entering and leaving the classroom or the door can be closed once all students have entered followed by hand sanitizing. As part of increasing social distance between students and surfaces requiring regular cleaning, schools could also consider eliminating the use of lockers, particularly if they are located in shared spaces or hallways, making physical distancing more challenging. If schools decide to use this strategy, it should be done within the context of ensuring that students are not forced to transport unreasonable numbers of books back and forth from school on a regular basis.

When elimination is not possible, surfaces that are used frequently, such a drinking fountains, door handles, sinks and faucet handles, etc., should be cleaned and disinfected at least daily and as often as possible. Bathrooms, in particular, should receive frequent cleaning and disinfection. Shared equipment including computer equipment, keyboards, art supplies, and play or gym equipment should also be

disinfected frequently. Hand washing should be promoted before and after touching shared equipment. Computer keyboard covers can be used to facilitate cleaning between users. practices should be used for indoor areas that have not been used for 7 or more days or outdoor equipment. Surfaces that are not high touch, such as bookcases, cabinets, wall boards, or drapes should be cleaned following standard protocol. The same applies to floors or carpeted areas.

Outdoor playgrounds/natural play areas only need routine maintenance, and hand hygiene should be emphasized before and after use of these spaces. Outdoor play equipment with high-touch surfaces, such as railings, handles, etc., should be cleaned and disinfected regularly if used continuously.

UV light kills viruses and bacteria and is used in some controlled settings as a germicide. UV light-emitting devices should not be used in the school setting, because they are not safe for children and adults and can cause skin and eye damage.

## Testing and Screening

Virologic testing is an important part of the overall public health strategy to limit the spread of COVID-19. Virologic testing detects the viral RNA from a respiratory (usually nasal) swab specimen. Testing all students for acute SARS-CoV-2 infection prior to the start of school is not feasible in most settings at this time. Even in places where this is possible, it is not clear that such testing would reduce the likelihood of spread within schools. It is important to recognize that virologic testing only shows whether a person is infected at that specific moment in time. It is also possible that the nasal swab virologic test result can be negative during the early incubation period of the infection. So, although a negative virologic test result is reassuring, it does not mean that the student or school staff member is not going to subsequently develop COVID-19. Stated another way, a student who is negative for COVID 19 on the first day of school may not remain negative throughout the school year.

If a student or school staff member has a known exposure to COVID-19 (e.g., a household member with laboratory-confirmed SARS-CoV-2 infection or illness consistent with COVID-19) or has COVID-19 symptoms, having a negative virologic test result, according to [CDC guidelines](#), may be warranted for local health authorities to make recommendations regarding contact tracing and/ or school exclusion or school closure.

The other type of testing is serologic blood testing for antibodies to SARS-CoV-2. At the current time, serologic testing should not be used for individual decision-making and has no place in considerations for entrance to or exclusion from school. [CDC guidance](#) regarding antibody testing for COVID-19 is that serologic test results should not be used to make decisions about grouping people residing in or being admitted to congregate settings, such as schools, dormitories, or correctional facilities. Additionally, serologic test results should not be used to make decisions about returning people to the workplace. The CDC states that serologic testing should not be used to determine

immune status in individuals until the presence, durability, and duration of immunity is established. The AAP recommends this guidance be applied to school settings as well.

Schools should have a policy regarding symptom screening and what to do if a student or school staff member becomes sick with COVID-19 symptoms. Temperature checks and symptom screening are a frequent part of many reopening processes to identify symptomatic persons to exclude them from entering buildings and business establishments. The list of symptoms of COVID-19 infection has grown since the start of the pandemic and the manifestations of COVID-19 infection in children, although similar, is often not the same as that for adults.

**School policies regarding temperature screening and temperature checks must balance the practicality of performing these screening procedures for large numbers of students and staff with the information known about how children manifest COVID-19 infection, the risk of transmission in schools, and the possible lost instructional time to conduct the screenings.** Schools should develop plans for rapid response to a student or staff member with fever who is in the school regardless of the implementation of temperature checks or symptom screening prior to entering the school building. In many cases, it will not be practical for temperature checks to be performed prior to students arriving at school. **Parents should be instructed to keep their child at home if they are ill.** Any student or staff member with a fever of 100.4 degrees or greater or symptoms of possible COVID-19 virus infection should not be present in school.

In lieu of temperature checks and symptom screening being performed after arrival to school, **methods to allow parent report of temperature checks done at home may be considered.** Resources and time may necessitate this strategy at most schools. The epidemiology of disease in children along with evidence of the utility of temperature screenings in health systems may further justify this approach. Procedures using texting apps, phone systems, or online reporting rely on parent report and may be most practical but possibly unreliable, depending on individual family's ability to use these communication processes, especially if not made available in their primary language. Although imperfect, these processes may be most practical and likely to identify the most ill children who should not be in school. School nurses or nurse aides should be equipped to measure temperatures for any student or staff member who may become ill during the school day and should have an identified area to separate or isolate students who may have COVID-19 symptoms.

COVID-19 infection manifests similarly to other respiratory illness in children. Although children manifest many of the same symptoms of COVID-19 infection as adults, some differences are noteworthy. [According to the CDC](#), children may be less likely to have fever, may be less likely to present with fever as an initial symptom, and may have only gastrointestinal tract symptoms. A student or staff member excluded because of symptoms of COVID-19 should be encouraged to contact their health care provider to



discuss testing and medical care. In the absence of testing, students or staff should follow local health department guidance for exclusion.

## Face Coverings and PPE

Cloth face coverings protect others if the wearer is infected with SARS CoV-2 and is not aware. Cloth masks may offer some level of protection for the wearer. Evidence continues to mount on the importance of universal face coverings in interrupting the spread of SARS-CoV-2. Although ideal, universal face covering use is not always possible in the school setting for many reasons. Some students, or staff, may be unable to safely wear a cloth face covering because of certain medical conditions (e.g., developmental, respiratory, tactile aversion, or other conditions) or may be uncomfortable, making the consistent use of cloth face coverings throughout the day challenging. For individuals who have difficulty with wearing a cloth face covering and it is not medically contraindicated to wear a face covering, behavior techniques and social skills stories (see resource section) can be used to assist in adapting to wearing a face covering. When developing policy regarding the use of cloth face coverings by students or school staff, school districts and health advisors should consider whether the use of cloth face coverings is developmentally appropriate and feasible and whether the policy can be instituted safely. If not developmentally feasible, which may be the case for younger students, and cannot be done safely (e.g., the face covering makes wearers touch their face more than they otherwise would), schools may choose to not require their use when physical distancing measures can be effectively implemented. School staff and older students (middle or high school) may be able to wear cloth face coverings safely and consistently and should be encouraged to do so. Children under 2 years and anyone who has trouble breathing or is unconscious, incapacitated, or otherwise unable to remove a face covering without assistance should not wear cloth face coverings.

For certain populations, the use of cloth face coverings by teachers may impede the education process. These include students who are deaf or hard of hearing, students receiving speech/language services, young students in early education programs, and English-language learners. Although there are products (e.g., face coverings with clear panels in the front) to facilitate their use among these populations, these may not be available in all settings.

Students and families should be taught how to properly wear (cover nose and mouth) a cloth face covering, to maintain hand hygiene when removing for meals and physical activity, and for replacing and maintaining (washing regularly) a cloth face covering.

School health staff should be provided with appropriate medical PPE to use in health suites. This PPE should include N95 masks, surgical masks, gloves, disposable gowns, and face shields or other eye protection. School health staff should be aware of the [CDC guidance on infection control](#) measures. Asthma treatments using inhalers with spacers are preferred over nebulizer treatments whenever possible. The [CDC recommends](#) that nebulizer treatments at school should be reserved for children who cannot use or do not have access to an inhaler (with spacer or spacer with mask). Schools should work with families and health care providers to assist with obtaining an inhaler for students



with limited access. In addition, schools should work to develop and implement asthma action plans, which may include directly observed controller medication administration in schools to promote optimal asthma control.

If required while waiting for a student to be picked up to go home or for emergency personnel to arrive, when using nebulizer or a peak flow meter, school health staff should wear gloves, an N95 [facemask](#), and eye protection. Staff should be trained on proper donning and doffing procedures and follow the CDC guidance regarding precautions when performing [aerosol-generating procedures](#). Nebulizer treatments should be performed in a space that limits exposure to others and with minimal staff present. Rooms should be well ventilated or treatments should be performed outside. After the use of the nebulizer, the room should undergo routine [cleaning and disinfection](#).

School staff working with students who are unable to wear a cloth face covering and who must be in close proximity to them should ideally wear N95 masks. When access to N95 masks is limited, a surgical mask in combination with a face shield should be used. Face shields or other forms of eye protection should also be used when working with students unable to manage secretions.

### **On-site School Based Health Services**

On-site school health services should be supported if available, to complement the pediatric medical home and to provide pediatric acute and chronic care. Collaboration with [school nurses](#) will be essential, and school districts should involve School Health Services staff early in the planning phase for reopening and consider collaborative strategies that address and prioritize immunizations and other needed health services for students, including behavioral health and reproductive health services.

### **Education**

The impacts of lost instructional time and social emotional development on children and adolescents should be anticipated, and schools will need to be prepared to adjust curricula and instructional practices accordingly without the expectation that all lost academic progress can be caught up. Plans to make up for lost academic progress because of school closures and distress associated with the pandemic should be balanced by a recognition of the likely continued distress of educators and students that will persist when schools reopen. If the academic expectations are unrealistic, school will likely become a source of further distress for students (and educators) at a time when they need additional support. It is also critical to maintain a balanced curriculum with continued physical education and other learning experiences rather than an exclusive emphasis on core subject areas.

### **Students With Disabilities**

The impact of loss of instructional time and related services, including mental health services as well as occupational, physical, and speech/language therapy during the period of school closures is significant for students with disabilities. Students with

disabilities may also have more difficulty with the social and emotional aspects of transitioning out of and back into the school setting. As schools prepare for reopening, school personnel should develop a plan to ensure a review of each child and adolescent with an IEP to determine the needs for compensatory education to adjust for lost instructional time as well as other related services.

Schools can expect a backlog in evaluations; therefore, plans to prioritize those for new referrals as opposed to re-evaluations will be important. Many school districts require adequate instructional effort before determining eligibility for special education services. However, virtual instruction or lack of instruction should not be reasons to avoid starting services such as response-to-intervention (RTI) services, even if a final eligibility determination is postponed.

### **Behavioral Health/Emotional Support for Children and Adolescents**

Schools should anticipate and be prepared to address a wide range of mental health needs of children and staff when schools reopen. Preparation for [infection control](#) is vital and admittedly complex during an evolving pandemic. But the emotional impact of the pandemic, financial/employment concerns, social isolation, and growing concerns about systemic racial inequity — coupled with prolonged limited access to critical school-based mental health services and the support and assistance of school professionals — demands careful attention and planning as well. Schools should be prepared to adopt an approach for mental health support.

Schools should consider providing training to classroom teachers and other educators on how to talk to and support children during and after the COVID-19 pandemic. Students requiring mental health support should be referred to school mental health professionals.

Suicide is the second leading cause of death among adolescents or youth 10 to 24 years of age in the United States. In the event distance learning is needed, schools should develop mechanisms to evaluate youth remotely if concerns are voiced by educators or family members and should be establishing policies, including referral mechanisms for students believed to be in need of in-person evaluation, even before schools reopen.

School mental health professionals should be involved in shaping messages to students and families about the response to the pandemic. Fear-based messages widely used to encourage strict physical distancing may cause problems when schools reopen, because the risk of exposure to COVID-19 may be mitigated but not eliminated.

When schools do reopen, plans should already be in place for outreach to students who do not return, given the high likelihood of separation anxiety and agoraphobia in students. Students may have difficulty with the social and emotional aspects of transitioning back into the school setting, especially given the unfamiliarity with the changed school environment and experience. Special considerations are warranted for students with pre-existing anxiety, depression, and other mental health conditions;

children with a prior history of trauma or loss; and students in early education who may be particularly sensitive to disruptions in routine and caregivers.

Students facing other challenges, such as poverty, food insecurity, and homelessness, and those subjected to ongoing racial inequities may benefit from additional support and assistance.

Schools need to incorporate academic accommodations and supports for all students who may still be having difficulty concentrating or learning new information because of stress associated with the pandemic. It is important that schools do not anticipate or attempt to catch up for lost academic time through accelerating curriculum delivery at a time when students and educators may find it difficult to even return to baseline rates. These expectations should be communicated to educators, students, and family members so that school does not become a source of further distress.

### **Mental Health of Staff**

The personal impact on educators and other school staff should be recognized. In the same way that students are going to need support to effectively return to school and to be prepared to be ready to process the information they are being taught, teachers cannot be expected to be successful at teaching children without having their mental health needs supported. The strain on teachers this year as they have been asked to teach differently while they support their own needs and those of their families has been significant, and they will be bringing that stress back to school as schools reopen.

Resources such as Employee Assistance Programs and other means to provide support and mental health services should be established prior to reopening. The individual needs and concerns of school professionals should be addressed with accommodations made as needed (e.g., for a classroom educator who is pregnant, has a medical condition that confers a higher risk of serious illness with COVID-19, resides with a family member who is at higher risk, or has a mental health condition that compromises the ability to cope with the additional stress). Although schools should be prepared to be agile to meet evolving needs and respond to increasing knowledge related to the pandemic and may need to institute partial or complete closures when the public health need requires, they should recognize that staff, students, and families will benefit from sufficient time to understand and adjust to changes in routine and practices. During a crisis, people benefit from clear and regular communication from a trusted source of information and the opportunity to dialogue about concerns and needs and feel they are able to contribute in some way to the decision-making process. Change is more difficult in the context of crisis and when predictability is already severely compromised.

### **Food Insecurity**

In 2018, 11.8 million children and adolescents (1 in 7) in the United States lived in a food-insecure household. The coronavirus pandemic has led to increased unemployment and poverty for America's families, which in turn will likely increase even further the number of families who experience food insecurity. School re-entry planning must consider the many children and adolescents who experience food insecurity

already (especially at-risk and low-income populations) and who will have limited access to routine meals through the school district if schools remain closed. The short- and long-term effects of food insecurity in children and adolescents are profound. **Plans should be made prior to the start of the school year for how students participating in free- and reduced- meal programs will receive food in the event of a school closure or if they are excluded from school because of illness or SARS-CoV-2 infection.**

### **Immunizations**

Existing school immunization requirements should be maintained and not deferred because of the current pandemic. In addition, although influenza vaccination is generally not required for school attendance, in the coming academic year, it should be highly encouraged for all students. School districts should consider requiring influenza vaccination for all staff members. Pediatricians should work with schools and local public health authorities to promote childhood vaccination messaging well before the start of the school year. It is vital that all children receive recommended vaccinations on time and get caught up if they are behind as a result of the pandemic. The capacity of the health care system to support increased demand for vaccinations should be addressed through a multifaceted collaborative and coordinated approach among all child-serving agencies including schools.

### **Organized Activities**

It is likely that sporting events, practices, and conditioning sessions will be limited in many locations. Preparticipation evaluations should be conducted in alignment with the [AAP Preparticipation Physical Evaluation Monograph](#), 5th ed, and state and local guidance.

### **Additional Information**

If you need a print version of this guidance, use the Print icon at the top of the page or download a pdf [here](#).

- Information for Parents on HealthyChildren.org: [Returning to School During COVID-19](#)
- [Guidance Related to Childcare During COVID-19](#)
- [Guidance on Providing Pediatric Well-Care During COVID-19](#)
- [List of latest AAP News articles on COVID-19](#)
- [Pediatrics COVID-19 Collection](#)
- [COVID-19 Advocacy Resources](#)(Login required)
- [Centers for Disease Control and Prevention: Considerations for Schools](#)
- [Centers for Disease Control and Prevention: School Decision Tree](#)
- [Centers for Disease Control and Prevention: Activities and Initiatives Supporting the COVID Response](#)

### **Resources**

- [Coalition to Support Grieving Students](#)
- [Using Social Stories to Support People with I/DD During the COVID-19 Emergency](#)
- [Social Stories for Young and Old on COVID-19](#)

**Interim Guidance Disclaimer:** The COVID-19 clinical interim guidance provided here has been updated based on current evidence and information available at the time of publishing. Guidance will be regularly reviewed with regards to the evolving nature of the pandemic and emerging evidence. All interim guidance will be presumed to expire in December 2020 unless otherwise specified.

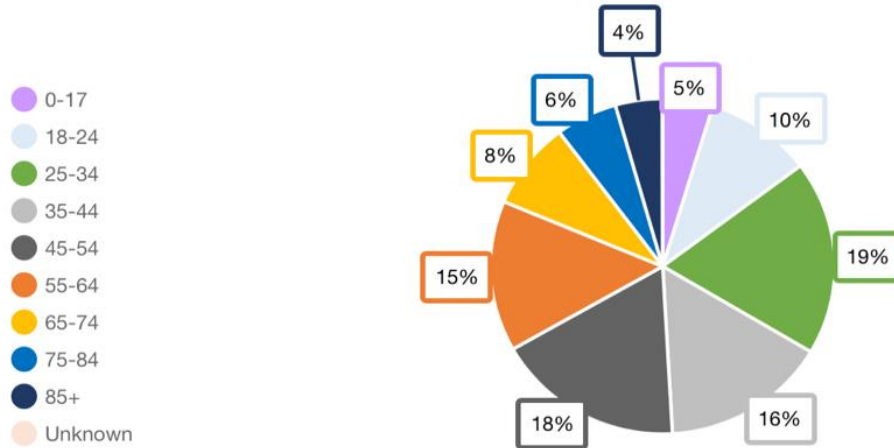
**Last Updated**

06/25/2020

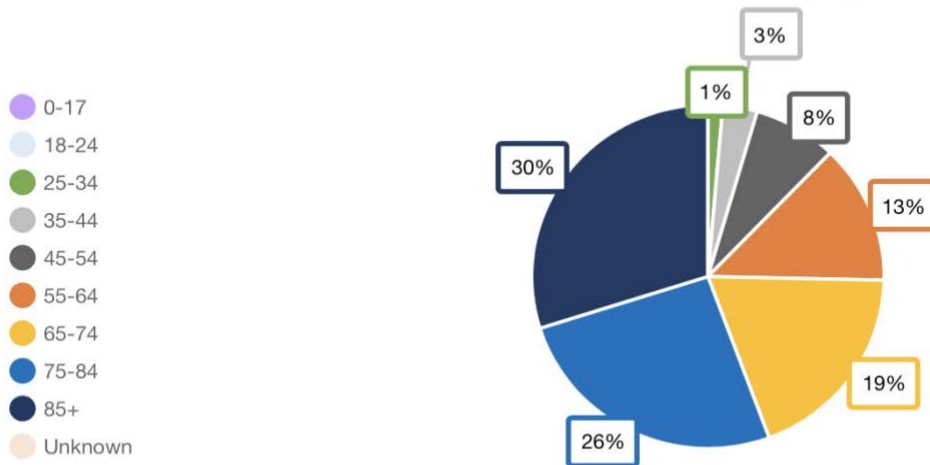
© Copyright 2020 American Academy of Pediatrics. All rights reserved.

## APPENDIX D- Orange County Covid-19 Cases and Deaths by Age

Cumulative COVID-19 Cases by Age

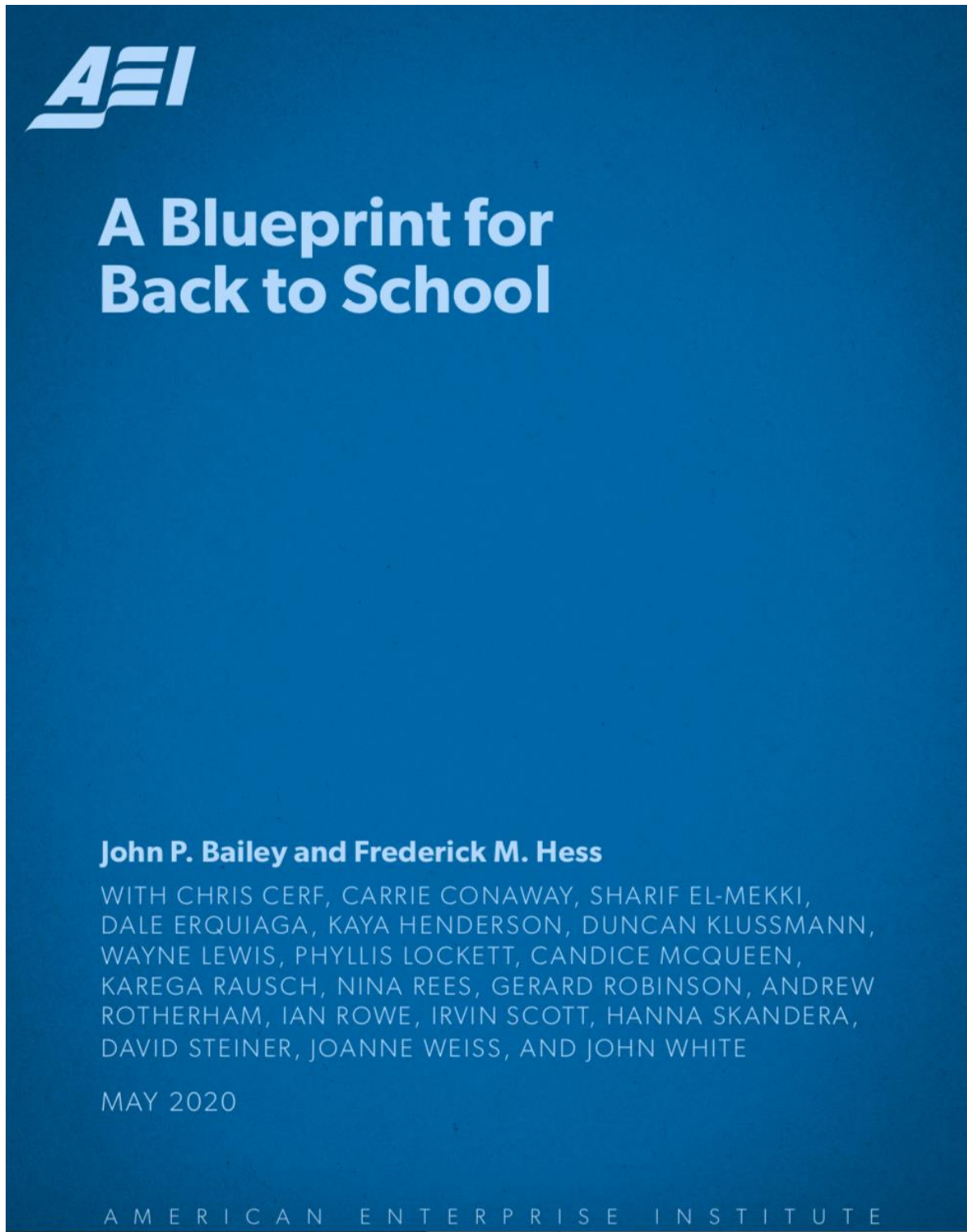


Cumulative COVID-19 Deaths by Age



Source: Orange County Healthcare Agency, June 16

**Appendix E- A Blueprint for Back to School. The American Enterprise Institute**





## **APPENDIX F- Statement: Southern California Chapter-American Academy of Pediatric**

American Academy of Pediatrics



DEDICATED TO THE HEALTH OF ALL CHILDREN™

**Southern California Chapter – Los Angeles, Central Coast and Inland Empire**

Press release

### **Local Pediatricians Urge Collaborative Decision-Making About Reopening Schools**

PASADENA, CA (June 2, 2020)

As pediatricians, our top priority is the health and safety of our children. We urge those in public health and education to work together to strike the right balance between preventing the spread of COVID-19 and providing children with the education, nutrition, physical activity, and mental health benefits provided through the reopening of schools.

The risk of COVID-19 transmission among groups of children has not been well-studied, but current research suggests that the risk is much lower than the adult population. The negative effects of missing in-person educational time as children experience prolonged periods of isolation and lack of instruction, however, is clear. Children rely on schools for multiple needs, including but not limited to education, nutrition, physical activity, socialization, and mental health. Special populations of students receive services for disabilities and other conditions that are virtually impossible to deliver online. Prolonging a meaningful return to in-person education would result in hundreds of thousands of children in Los Angeles County being at risk for worsening academic, developmental and health outcomes.

Because of the nature of COVID-19 and of Los Angeles County, we cannot implement a one-size-fits-all set of rules for reopening schools. Los Angeles County covers more than 4,700 square miles and has a population of more than 10 million. Schools must have the flexibility to implement intermittent closures, phased reopenings, and isolation protocols that are appropriate for their specific areas and their specific populations.

“Our concern is that recently issued guidelines for schools re-opening in Los Angeles County are not realistic or even developmentally appropriate for children,” says Dr. Alice Kuo, President of the Southern California chapter of the American Academy of Pediatrics. “For example, wearing masks throughout the day can hinder language and socio-emotional development, particularly for younger children.”



“The guidelines need to be flexible for different age groups within a school district,” says Kuo. “They also need to take into account what is feasible for the most number of students to return to in-person education, including practical spacing measures.”

The AAP encourages collaborative decision-making among school districts and local and state public health departments to balance the academic needs of students with minimizing the risk of transmission of COVID-19. Pediatricians want to be involved in these discussions as experts on children’s health and development. The national AAP recommendations for return to in-person education in schools can be found on our website at:

<https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/covid-19-planning-considerations-return-to-in-person-education-in-schools/>

*The Southern California chapter of the American Academy of Pediatrics is an organization of 1,500 primary care pediatricians, pediatric medical subspecialists and pediatric surgical specialists dedicated to the health, safety and well-being of infants, children, adolescents and young adults.*

AAP Southern California Chapter 2 (AAP-CA2) Chapter2@aap-ca.org (818) 422-9877  
[www.aapca2.org](http://www.aapca2.org)

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**  
 16 Plaintiffs,  
 17 v.  
 18 **GAVIN NEWSOM, et al.**  
 19 Defendants.

20 Case No.: 2:20-cv-06472 DDP (AFMx)

21 **DECLARATION OF JAMES M.**  
 22 **REARDON IN SUPPORT OF**  
 23 **MOTION FOR PRELIMINARY**  
 24 **INJUNCTION**

25 Judge: Hon. Dean D. Pregerson

26 **I, JAMES M. REARDON, declare as follows:**

27 1. I am a citizen of the United States. I have personal knowledge of the  
 28 facts set forth in this declaration. If called as a witness, I could and would testify  
 competently to the matters set forth herein.

2. I am the President of the Capistrano Unified School District (“CUSD”)  
 Board of Trustees, where I represent the unincorporated communities of Ladera Ranch,  
 Escencia, Sendero, Las Flores, Coto de Caza, and incorporated San Juan Capistrano.



1           3.       I am a co-founder of New Vista School, a 501(c)(3) charitable non-profit  
2 private school, located in Laguna Hills, CA. New Vista serves the educational, social  
3 and vocational needs of students with Autism Spectrum Disorder, as well as students  
4 with similar learning needs. New Vista is an accredited secondary school program for  
5 grades 6 through 12, operating as a private school for students who are placed by  
6 parents, while also serving public students under contract-placement from local public-  
7 school districts.

8           4.       I am also the father of an autistic son. For all these reasons, I have  
9 specialized knowledge and personal experience in how to educate children and children  
10 with special needs.

11           5.       CUSD is the 11th largest school district in California by enrollment,  
12 serving the incorporated cities of San Clemente, Dana Point, Laguna Niguel, Mission  
13 Viejo, Rancho Santa Margarita, Aliso Viejo and San Juan Capistrano, as well as a  
14 populous unincorporated area of the County of Orange. CUSD's 56 schools serve  
15 48,000 students and their families.

16           6.       Of the 48,000 students in CUSD, more than twelve percent are assigned  
17 Individual Education Programs (IEPs) due to their special needs. Of the 6,156 students  
18 with IEPs, approximately one-third require close support and instruction from teachers  
19 and other staff with specialized credentials and skills.

20           7.       Importantly, CUSD supports more than a thousand students with formal  
21 accommodation plans under provisions of section 504 of the Rehabilitation Act of  
22 1973. Such plans require the school district to provide learning accommodation to  
23 students with handicapping conditions, such as special classroom seating, assistive  
24 technology, extra time, and a myriad of other supportive accommodations that allow  
25 these students to participate in education on a more equal footing with their peers.  
26  
27  
28

1 Many of the critical accommodations mandated by these 504 plans are impossible to  
2 provide through online instruction and are abandoned without due process.

3 8. On July 15, 2020, the CUSD Board of Trustees met to discuss and approve  
4 our district's plan for reopening schools; the plan was under development since May.  
5 At that time, we recognized that distance-learning provides an inadequate learning  
6 experience for many, if not the majority of our 48,000 students, but especially those  
7 receiving special services and accommodation under IEPs and 504 plans.

8 9. CUSD operated three in-class summer school programs during July, all  
9 with the necessary COVID-19 protection measures outlined in the guidance provided  
10 by the California Department of Public Health. We experienced no problems related to  
11 these programs. However, as a result of the Governor's July 17, 2020 order, CUSD  
12 canceled its summer school program and sent students home. The program was  
13 exclusively for the most academically at-risk students in our district that are known to  
14 be at least two grade levels behind their actual standing. This cancellation had a serious  
15 impact on students, some with special needs.

16 10. A prolonged shutdown of schools will have significant negative  
17 consequences for children with special needs and handicapping conditions. Learning  
18 and developmental support will be incredibly difficult for them in an online  
19 environment. Autistic children require a tremendous amount of direct support and will  
20 undoubtedly regress while participating in online learning, which can provide little to  
21 no support for their developmental, speech, occupational therapy, behavior (i.e., social  
22 skills), and academic needs. How do you conduct speech or occupational therapy or  
23 provide behavioral support effectively online? The answer is: it's impossible.  
24 Practically speaking, schools are unable to provide most services called for in the  
25 students' IEPs and 504 plans while online, because schools do not send staff into the  
26 students' homes. Although some schools may claim to offer services online, a student  
27  
28

1 with special needs student simply will not receive the legally mandated IEP services or  
2 504 accommodations.

3 11. Schools provide a venue for student-teacher interaction and create a sense  
4 of structure; indeed, all students require this. For students with special needs, this  
5 requirement is enshrined in the Individuals with Disabilities Education Act (“IDEA”),  
6 which establishes that students have a right to be educated in the least restrictive  
7 environment to facilitate their social development. The Governor’s order ignores this  
8 legal requirement by forcing students into a very restricted online environment at home,  
9 without justification.

10 12. When students are sent home, the quality of learning varies significantly  
11 for each student depending on the conditions in the household. For example, in affluent  
12 households, parents have jobs that enable or require them to work from home.  
13 Although these households may have computers and broadband internet, they are not  
14 necessarily available for use by students as their parents may use them working from  
15 home. Conversely, in a lower-income household parents may work away from home  
16 and thus provide no support for their children, regardless of how much free technology  
17 support is provided by the schools. Irrespective of socioeconomic status, many families  
18 are unable to maintain a household conducive to learning when they all share the same  
19 living space.  
20

21 13. Enforcing the Governor’s order at a county level is illogical as the order  
22 essentially combines southern Orange County with far-away northern communities,  
23 applying a one-size-fits-all approach rather than tailoring guidance to the specific needs  
24 of each school district. The order does not properly consider the different  
25 circumstances in each community, school district or school, and unjustly closes schools  
26 without any evidence that schools pose a risk to the children or greater population.  
27  
28

1 14. Schools must reopen for in-person instruction to ensure that every child is  
2 protected and provided the special needs services not capable of being provided through  
3 online learning. Special needs students and those with handicaps will suffer the  
4 negative consequences of these unnecessary school closures and such harm will only  
5 worsen, unless they are permitted to return to in person instruction.

6 I declare under penalty of perjury under the laws of the United States of America  
7 and the State of California that the foregoing is true and correct.  
8  
9

10  
11 Dated: July 25, 2020

DocuSigned by:  
James M. Reardon  
0016145B1EFD454...  
James M. Reardon



1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**  
 16 Plaintiffs,  
 17 v.  
 18 **GAVIN NEWSOM, et al.**  
 19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF ANNA**  
 21 **WALKER IN SUPPORT OF**  
 22 **MOTION FOR PRELIMINARY**  
 23 **INJUNCTION**

Judge: Hon. Dean D. Pregerson

24 **I, ANNA WALKER, declare as follows:**

25 1. I am a citizen of the United States. I have personal knowledge of the  
 26 facts set forth in this declaration. If called as a witness, I could and would testify  
 27 competently to the matters set forth herein.

28 2. For over twenty years, I have been a special education teacher,  
 diagnostician, and school administrator in both Northern and Southern California,  
 serving public schools. I hold a master’s degree in Special Education. I also hold



1 several credentials, including one in Severely Handicapped and Learning Handicapped.  
2 I also hold a multiple Subjects Learning Credential and a clear Administrative  
3 Credential.

4 3. I have worked for the California Department of Education in the  
5 Diagnostic Centers, visiting schools from the Mexican border to northern California, to  
6 work with school teams to conduct student assessments, develop Individualized  
7 Education Programs (“IEPs”), and provide training to schools and families. For the  
8 past ten years, I have been a special education administrator overseeing the  
9 implementation of special education services for over an estimated 2,000 students in  
10 both the Bay Area and Los Angeles County.

11 4. As of the end of the 2018-19 school year, there were 795,000 students  
12 enrolled in California schools that received special education. That amounts to 12.5  
13 percent of the total enrollment.

14 5. When school campuses are closed and education is moved entirely online,  
15 many of the guarantees and key tenants afforded to special needs children under the  
16 Individuals with Disabilities Education Act (“IDEA”) collapse. The home is  
17 recognized as being the most restrictive setting in the continuum of special education  
18 placements, next to a residential treatment facility. The IDEA clearly states that  
19 students with disabilities have a right to be in the least restrictive setting. I know from  
20 first-hand experience that, even under the best of circumstances, it is challenging for  
21 schools to provide a free and appropriate education in the least restrictive environment.  
22 At a minimum, waivers should be allowed for students with special needs to so that  
23 they can receive in-person instruction.

24 6. Numerous students rely on the schools to administer medications. I have  
25 worked with several students, including one with diabetes and ADHD who required a  
26 one-on-one aide and school nurses to manage the medication regime. This student is  
27 not an isolated case; indeed, numerous others are literally having their lives jeopardized  
28 while schools remain closed.



1           7. Many students with special needs, particularly more severely disabled  
2 students, have a myriad of health needs that require services from schools to address.  
3 Simple day-to-day tasks, such as eating, balancing, etc., may require special education  
4 and services that simply cannot be provided virtually. For example, there is no way for  
5 a teacher or orientation and mobility specialist to help a student learn to use the school  
6 restroom independently on Zoom.

7           8. There is also a significant assessment problem when children are not in  
8 school. When California schools transitioned to online learning, missing was the  
9 extremely complex processes that underlie the development, monitoring, and review of  
10 the IEP. The process for one single student to go through the referral and assessment  
11 process and develop an IEP takes collectively, on average, over 100 hours of  
12 collaborative effort, and it must be done in an educational environment. Several key  
13 parts of this process simply cease to exist when schools are closed. While many  
14 districts were holding IEP meetings online during school closures, a valid, new IEP  
15 cannot be developed under these circumstances for several reasons. Furthermore, IEPs,  
16 under the IDEA were never designed to be implemented in the home setting. For  
17 students to receive their special needs services outlined in the IEPs, they must be in  
18 school.

19           9. Perhaps the most notable issue is that of access and equity. Even when  
20 students with special needs are being offered virtual services, there is mounting  
21 evidence that there are significant and disturbing inequalities among students of color  
22 and from lower income households. One survey found that 4 out of 10 families  
23 reported that they were not receiving any special education support at all. Just 1 in 5  
24 families reported that they are receiving all the services their children are entitled to on  
25 their IEP. Thirty-five percent report that their children are doing little to no remote  
26 learning, compared with seventeen percent of their general education peers.  
27 Importantly, when these results were disaggregated based on family household income,  
28 the results were startling: thirty percent of households earning less than \$25,000 per

1 year reported that their child was receiving none of their supports as compared to ten  
2 percent of households earning over \$100,000 per year. The statistics are staggering and  
3 prove that school closures cause access and equity issues.

4 10. Schools are the best venues to provide students with their legally mandated  
5 special services. For example, over thirty percent of all students that have IEPs are  
6 identified as learning disabled. The vast majority of these students have trouble  
7 learning to read. Special educators with the proper training in a school setting can help  
8 children fix this, but it requires certain services that simply cannot be replicated by  
9 families in the home.

10 11. Reopening schools is necessary so that special needs children may receive  
11 the services they are legally entitled to and children do not suffer further harm. Schools  
12 must also reopen so that families who opt for in-person instruction may avail their  
13 children of all the benefits that their special education will provide them to live  
14 successful lives. We cannot allow special needs students and those with handicaps to  
15 suffer the negative consequences of these unnecessary school closures.

16 I declare under penalty of perjury under the laws of the United States of America  
17 and the State of California that the foregoing is true and correct.

18  
19 Dated: July 26, 2020

DocuSigned by:  
*Anna Walker*  
5B049B89CF854D5...  
\_\_\_\_\_  
Anna Walker



1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT**  
 14 **CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

**DECLARATION OF ALISON M. KEECH IN SUPPORT OF MOTION FOR PRELIMINARY INJUNCTION**

Judge: Hon. Dean D. Pregerson

20 **DECLARATION OF ALISON M. KEECH**

21 I, Alison M. Keech, declare as follows:

22 1. I am a credentialed California teacher, duly qualified to teach all subjects  
 23 in K-6 classrooms in the State of California. As explained more fully below, I am  
 24 currently employed as a fifth grade mathematics teacher in a middle school in the Los  
 25 Angeles Unified School District located and serving families in historically underserved  
 26 communities. I have firsthand, personal knowledge of the facts set forth below and if  
 27 called as a witness could and would competently testify thereto.  
 28



1           2.     My personal educational background is as follows: I received a Bachelor  
2 of Arts (Honours) in Geography, with a minor in French, from Queen’s University in  
3 Kingston, Ontario, Canada in 2007. I received a Bachelor of Education from Queen’s  
4 University in Kingston, Ontario, Canada in 2008. I received my Master of Arts in  
5 Education with a focus in Bilingual/Bicultural Childhood Education from Teachers  
6 College at Columbia University in New York, New York in 2011.

7           3.     After completing several practical classroom internships during my  
8 undergraduate and graduate education, my full-time teaching career began in 2010.  
9 Specifically, I served as a second grade teacher in a dual-language French-English  
10 public school classroom at P.S. 58 in Brooklyn, New York, from 2010 through 2011.

11          4.     From 2011 through the birth of my first child in 2012, I served as a second  
12 grade teacher at Futuro College Preparatory Elementary School in the El Sereno  
13 neighborhood of Los Angeles, California.

14          5.     Since returning to work full-time in 2018, I have served as a fifth grade  
15 mathematics teacher at Valor Academy Charter Middle School in the North Hills  
16 neighborhood of Los Angeles, California.

17          6.     During the period of time that I taught second grade at Futuro College  
18 Preparatory Elementary School in the El Sereno neighborhood of Los Angeles, the  
19 student body was **approximately 99.6% Hispanic or Latino**, as determined by the  
20 California Department of Education, and where **approximately 91% of the student**  
21 **body was eligible for free or reduced lunch**, a commonly utilized indicator of student  
22 poverty whose eligibility is defined by the state and federal governments. In addition,  
23 **more than half of the student body were classified as “English Language**  
24 **Learners,”** which is a pedagogical term that generally refers to students who often  
25 come from non-English-speaking homes and backgrounds and who generally require  
26 specialized or modified instruction in both the English language and their academic  
27 courses.

28

1           7. In my current role as fifth grade mathematics teacher at Valor Academy  
2 Charter Middle School in the North Hills neighborhood of Los Angeles, I teach students  
3 who are **approximately 94% Hispanic or Latino**, as determined by the California  
4 Department of Education, and where **approximately 83% of the student body is**  
5 **eligible for free or reduced lunch**. Approximately **one quarter of the student body is**  
6 **classified as “English Language Learners.”**

7           8. Despite these challenges, and at least prior to March 2020, all objective  
8 measures of which I am aware showed that the academic, social and emotional needs of  
9 our students were being met in a way that exceeded comparable neighborhood schools.

10          9. In March 2020, due to the initial effects of state and local orders associated  
11 with the COVID-19 pandemic, our school joined others across the state and country in  
12 closing its doors to in-person instruction. Because it was initially anticipated that this  
13 closure would not last more than two weeks, our school at first did not require live  
14 virtual instruction for our students. Instead, our students were directed to (a) complete  
15 one page of notes per week per subject drawn from commonly-available online  
16 resources; and to (b) attempt an assessment for each such page of notes so completed.

17          10. Although I understand that most LAUSD schools largely proceeded with a  
18 similar model for the remainder of the 2019-20 school year, we as educators quickly  
19 and collaboratively determined that the model negotiated for use in traditional LAUSD  
20 district schools did not satisfy basic pedagogical standards and would not meet the  
21 educational needs of our students. Accordingly, we decided at the end of March 2020 to  
22 transition our students to live daily virtual remote instruction, which we utilized from  
23 April 2020 through June 2020.

24          11. To effectuate the delivery of this instruction, on the first Monday after  
25 school closed, laptops and chargers were distributed to students and we directed our  
26 families to free Internet resources being provided. Our initial hope in taking these steps  
27 was that live daily virtual remote instruction would begin to meet the educational needs  
28 of our students.

1           12. The pedagogical specifics were as follows: each of our students was  
2 provided with (a) between **five and seven hours each day of live virtual teacher**  
3 **interaction over the Zoom videoconferencing platform**, including both “main” and  
4 “breakout” rooms; with (b) approximately **five hours each day of core content**  
5 **instruction in Math, Reading, Writing and Science** – approximately one hour per  
6 subject per teacher; and (c) spread out throughout each week, **at least one hour of**  
7 **virtual visual art**, **at least one hour of virtual physical education** and **at least one**  
8 **hour of social-emotional learning and office hours** led by each teacher. Written  
9 assignments were distributed and reviewed via Google Classroom and similar online  
10 tools.

11           13. In order to facilitate this live virtual teacher interaction, I and my  
12 colleagues used all available virtual learning best practices. We created and  
13 implemented numerous virtual lesson plans in conjunction with my peers and  
14 administrators. In addition, we had weekly grade-level meetings where we refined our  
15 lesson plans. And we regularly pooled our collective child development education and  
16 expertise to discuss what was working, what was not working and where we could do  
17 better, both generally and with respect to specific students.

18           14. Unfortunately, as hard as we worked and as many best practices as we  
19 implemented, I quickly discovered that any model of live daily virtual remote  
20 instruction through virtual platforms is so lacking in the ability to provide for basic  
21 classroom management and other pedagogical features that it does not and will not  
22 work for young children – particularly those from the underserved and  
23 socioeconomically disadvantaged communities where I teach – and thus largely fails to  
24 meet their basic educational needs.

25           15. As but one illustration, from April through June of 2020, I was responsible  
26 for teaching mathematics to **128 fifth grade children**. Despite frequent student-specific  
27 interventions, on any given day and during any given class, **less than 10%** – or a total  
28 overall average of **between 10 and 12 children** – logged in to and “attended” live



1 virtual instruction through the Zoom platform. **The maximum number of my 128**  
2 **students that logged in for live virtual instruction from April through June of 2020**  
3 **was 17.** Far fewer actually turned on their video and participated in class – on average,  
4 **between 6 and 7 children per class.** This level of participation was consistent with the  
5 experience of all of my colleagues. Collectively, **only about 60% of my students**  
6 **properly completed their virtually-assigned assignments.**

7 16. It is my understanding that in 2015, Stanford University pedagogical  
8 researchers comprehensively studied the impact of virtual learning models as opposed  
9 to in-person education models and found that, on average, white, non-poverty, non-  
10 “English Language Learner” and non-special education students who were subject to  
11 virtual learning **were behind their in-person peers to an extent that reflected an**  
12 **equivalent of 180 fewer days of instruction in math and 72 fewer days of**  
13 **instruction in reading.** Attached hereto as Exhibit \_\_\_ is a true and correct copy of this  
14 study.

15 17. I have reviewed Exhibit \_\_\_ and have concluded that, if anything given the  
16 demographics of the students that I teach, the findings of this study may understate the  
17 learning loss that my students experienced from March through June of 2020. Being  
18 prevented from providing in-person instruction has resulted in a situation where my  
19 students have forgotten essential, standards-based skills taught thoroughly earlier in the  
20 year. Moreover, even those children who are motivated and engaged have fallen  
21 steadily behind; those who were already struggling to meet grade level standards find  
22 themselves even more so.

23 18. Virtual learning is thus not a real substitute of any kind – whether  
24 temporary or permanent – for in-person education. Young children like those I teach, in  
25 addition to dual-language, “English Language Learners” and special needs children are  
26 being especially harmed. Its forced use improperly interferes with our professional  
27 judgment as educators and is damaging the children for which we as educators are  
28 responsible. Our students cannot simply press “pause” on their development as the

1 adults in charge attempt to sort out the politics of this pandemic. We may never  
2 ultimately be able to fully compensate for these compounding academic, social and  
3 emotional learning losses at all, let alone in a virtual learning environment.

4 19. As I have experienced and thus recognize the failings of virtual instruction,  
5 I know that it is necessary to return to in-person instruction now in order to meet the  
6 basic educational needs of our community. As such, as of the week of July 13, 2020, we  
7 were planning to provide in-person instruction opportunities for the students that we  
8 serve consistent with social distancing and other guidelines adopted in other states and  
9 in countries around the world. I was, and remain, fully prepared to take whatever  
10 precautions that may necessary to deliver such in-person instruction and know that such  
11 instruction is not only possible but is essential.

12 20. At the end of that week, our collective efforts were halted. The reason, as I  
13 ultimately learned, was that we as educators had been deprived by the state of the  
14 choice to provide in-person instruction to our students and that virtual learning had been  
15 mandated. At no time was I (or, to my knowledge, my colleagues) consulted by any  
16 state or local officials regarding (a) our professional pedagogical judgment; or (b) our  
17 own professional experience with virtual learning prior to this decision being made.  
18 This absence of meaningful consultation remains the case today.


19 21. Since July 17, 2020, I have listened carefully to state officials and have  
20 reviewed the resources that I understand state and local officials publicly claim have  
21 provided to educators to provide for what they apparently believe will be a “robust”  
22 model of distance learning, including, *inter alia*, the California Department of  
23 Education’s “Distance Learning” resources, available at  
24 <https://www.cde.ca.gov/ci/cr/dl/>, and the Los Angeles Unified School District’s  
25 “Remote Learning Resources” for mathematics, available at  
26 <https://achieve.lausd.net/site/default.aspx?PageType=3&ModuleInstanceID=9858&ViewID=ed695a1c-ef13-4546-b4eb-4fefcdd4f389&RenderLoc=0&FlexDataID=87781&PageID=1237&Comments=true>.



1 22. Having carefully reviewed the foregoing and listened to and understood  
2 what state and district officials are planning to provide, it is my professional judgment  
3 that what is being planned to effectuate what is being characterized as “robust” distance  
4 learning is not only not “robust” but is not sufficient to satisfy the minimum obligations  
5 that we as educators owe to our students in the State of California. In fact, the model  
6 being characterized by the state as “robust” will involve less actual education than the  
7 model described above implemented at my school between April and June of 2020.

8 I declare under penalty of perjury under the laws of the United States of America  
9 that the foregoing is true and correct.

10 Executed this 24th day of July 2020, at Los Angeles, California.

11 DocuSigned by:  
12   
13 Alison M. Keech

## EXHIBIT 15



**credo**  
CENTER FOR RESEARCH ON EDUCATION OUTCOMES

# Online Charter School Study **2015**

# Online Charter School Study

## 2015

James L. Woodworth, Ph.D. – Lead Analyst  
Margaret E. Raymond, Ph.D. – Project Director  
Kurt Chirbas – Graphics and Figures  
Maribel Gonzalez – Data Collection  
Yohannes Negassi, M.A. – Research Analyst  
Will Snow, M.A. – Database Manager  
Christine Van Donge, Ph.D. – Research Analyst



**credo**

CENTER FOR RESEARCH ON EDUCATION OUTCOMES

© 2015 CREDO

**Center for Research on Education Outcomes**  
**Stanford University**  
**Stanford, CA**  
<http://credo.stanford.edu>

CREDO, the Center for Research on Education Outcomes at Stanford University, was established to improve empirical evidence about education reform and student performance at the primary and secondary levels. CREDO at Stanford University supports education organizations and policymakers in using reliable research and program evaluation to assess the performance of education initiatives. CREDO's valuable insight helps educators and policymakers strengthen their focus on the results from innovative programs, curricula, policies and accountability practices.

### Acknowledgements

CREDO gratefully acknowledges the support of the State Education Agencies and School Districts who contributed their data to this partnership. Our data access partnerships form the foundation of CREDO's work, without which studies like this would be impossible. We strive daily to justify the confidence you have placed in us.

CREDO also acknowledges the support of the Walton Family Foundation for this research.

The views expressed herein do not necessarily represent the positions or policies of the organizations noted above. No official endorsement of any product, commodity, service or enterprise mentioned in this publication is intended or should be inferred. The analysis and conclusions contained herein are exclusively those of the authors, are not endorsed by any of CREDO's supporting organizations, their governing boards, or the state governments, state education departments or school districts that participated in this study. The conclusions of this research do not necessarily reflect the opinions or official position of the Texas Education Agency, the Texas Higher Education Coordinating Board, or the State of Texas.

## Table of Contents

1. Introduction .....	1
Purpose of Study.....	1
Need for the Study .....	1
Questions to Be Addressed.....	2
2. Methods and Data .....	4
Identifying Online Charter Schools .....	4
Consolidating Student Data from Multiple States .....	5
Multiple Datasets .....	6
Matched Data .....	6
Selection of Comparison Observations.....	6
Brick-District VCR Matched Sample .....	8
Mobility Study Data Set .....	10
Basic Analytic Model .....	11
Mixed Methods Analysis.....	14
Presentation of Results.....	15
3. Student Mobility.....	16
Characteristics of Online Charter Mobility .....	16
Mobility and Student Characteristics .....	20
Mobility by Race-Ethnicity .....	20
Mobility by Student Sub-populations .....	21
4. Impact Analysis .....	23
Online Charter Students Compared to Brick-District Students .....	23
Results by State.....	25
Sub-populations .....	27
Race-ethnicity .....	27
Students in Poverty.....	28
English language learners .....	29
Special education students .....	30
Interpretation of Subpopulation Effects.....	31
Online Charter Schools Compared to Brick-District Schools .....	35
Network Affiliation.....	37
Online Charter Students Compared to Brick-Charter Students.....	39
Mixed-Methods Analyses .....	40
Student Testing Data and School Survey Data .....	40
Self-Paced Delivery .....	41

Synchronous vs. Asynchronous.....	42
Class Size.....	43
School and Family Interactions.....	43
Methods of Class Communication.....	47
School-Level Data and School Survey Data .....	49
School-Wide Policies.....	49
Student Support Activities .....	52
School and Family Interactions.....	55
Professional Development and Compensation .....	55
Non-Significant Findings .....	59
Student Testing Data and Policy Changes .....	59
Summary and Implications .....	61
Implications .....	63
Appendix A: DESCRIPTIVE PROFILE OF ONLINE CHARTER STUDENTS .....	64
Appendix B: TECHNICAL APPENDIX.....	68
Empirical Bayesian Shrinkage.....	69
Alternative Specifications.....	71
Brick-and-Mortar Charter School VCR.....	71
Generalized OLS Model on Multi-Year Panel Data .....	73
Restricted OLS Model on Multi-Year Panel Data .....	74
Online Charter School Choice Analysis .....	76
Appendix C: CORRELATES OF SCHOOL-LEVEL EFFECTS WITH SURVEY REPSONSES .....	81
References.....	104

## Table of Figures

Figure 1: CREDO VCR Methodology .....	8
Figure 2: Mobility Rates by Subpopulation .....	22
Figure 3: Impact of Online Charter Attendance on Average Student Academic Growth, Reading and Math .....	23
Figure 4: Impact of Online Charter Attendance on Academic Growth by Year, Reading and Math .....	24
Figure 5: Online Charter Effect Size by State, Reading .....	26
Figure 6: Online Charter Effect Size by State, Math .....	27
Figure 7: Overall Academic Growth for Students in Poverty Compared to Students Not in Poverty, Reading and Math .....	29
Figure 8: Overall Academic Growth for English Language Learners Compared to Non-English Language Learners, Reading and Math .....	30
Figure 9: Overall Academic Growth for Special Education Students Compared to Non-Special Education Students, Reading and Math .....	31
Figure 10: Expected Values of Effect Sizes by Student Profile, Reading .....	33
Figure 11: Expected Values of Effect Sizes by Student Profile, Reading .....	34
Figure 12: Online Charter School Quality Curve: Reading and Math.....	36
Figure 13: Relationship between Growth and Attending an Online Charter School with Self-Paced Classes .....	41
Figure 14: Count of Schools by Number of Synchronous Hours of Instruction .....	43
Figure 15: Relationship between Monitoring Teacher/Family Interactions and Student Academic Growth .....	44
Figure 16: Relationship between Expected Parental Roles and Academic Growth, Reading .....	46
Figure 17: Relationship between Expected Parental Roles and Academic Growth, Math .....	47
Figure 18: Race-Ethnicity of Brick-District VCR Matched Sample Data Set, Math.....	65
Figure 19: Brick-District VCR Matched Sample Sub-Populations by Year, Math .....	66
Figure 20: Pre-Online Achievement Decile of Online Charter Students, Math.....	67
Figure 21: Online Charter Effect Size by State for Online Charter vs. Brick-Charter, Reading .....	72
Figure 22: Online Charter Effect Size by State for Online Charter vs. Brick-Charter, Math.....	73
Figure 23: Average Growth for First Year in Online Charter and Subsequent Year by Stayer/Leaver Status .....	76



## Table of Tables

Table 1: States with Online-Students.....	5
Table 2: Student Population Demographics by TPS Sector .....	9
Table 3: Student Record Demographics for Mobility Study .....	11
Table 4: Number and Percentage of Records per Period .....	11
Table 5: Grade at Initial Enrollment in Online Charter School for New Entrants.....	17
Table 6: Duration of Student Enrollment in Online Charter Schools by Entry Year.....	17
Table 7: Percentage of Online Students Remaining in Online Charter Schools by State.....	18
Table 8: Mobility Rates for Students by Sector and State .....	19
Table 9: Annual Rates of Return from Online School to Traditional Schools .....	20
Table 10: Grade on Return to TPS from Online Charter School .....	20
Table 11: Mobility Rates by Race-Ethnicity and Sector .....	21
Table 12: Effect Size of Attending Online Charter School by Racial-Ethnic Group, Reading and Math ....	28
Table 13: Effect Sizes by Network Compared to Average VCR, Reading and Math.....	38
Table 14: Effect Sizes by Network Compared to Independent Online Charter Schools, Reading and Math .....	39
Table 15: Summary of Significant Online Charter Impacts by VCR Group .....	40
Table 16: Reported Average and Maximum Class Size by School Level.....	43
Table 17: Tools Used to Support Synchronous Instruction, Reading and Math.....	48
Table 18: School-Wide Policies, Reading and Math.....	50
Table 19: Course Credits and Assessment Frequency, Reading and Math.....	50
Table 20: School-Wide Policies Relating to Curriculum and Instruction, Reading and Math.....	52
Table 21: Entry Assessment for New Enrollees .....	53
Table 22: Providers of One-on-One Support to Students, Reading and Math.....	54
Table 23: School-Provided Supports .....	54
Table 24: Relationship between Expected Parental Roles and Academic Growth, Reading and Math ....	55
Table 25: Teacher Professional Development Activities, Reading and Math.....	56
Table 26: School Leader Professional Development Activities, Reading and Math .....	56
Table 27: Influencing Factors for Teacher Compensation, Reading and Math.....	57
Table 28: Influencing Factors for School Leader Compensation, Reading and Math.....	58
Table 29: Percent of School Leader Time by Task, Reading and Math .....	58
Table 30: Survey Items of Interest with Non-Significant Correlations with Math and Reading Effect Sizes .....	59
Table 31: Correlations between Education Policies and School-Level Effects.....	60
Table 32: State-Level Policy Change Description .....	61
Table 33: Number of Matched Online Charter Students by State and Year, Math.....	64
Table 34: Empirical Bayesian Shrinkage of Effect Sizes by Network Compared to Independent Online Charter Schools, Reading and Math .....	70
Table 35: Student Population Demographics by Charter Sector .....	71

Table 36: Effect Size by Subpopulations for Online Charter vs. Brick-Charter, Reading and Math ..... 71

Table 37: Panel Data Unrestricted OLS Regression Output, Reading and Math..... 74

Table 38: Panel Data Restricted OLS Regression Output, Reading and Math..... 75

Table 39: Continuing Online Charter Enrollees Compared to One Year Enrollees – Marginal Results, Reading ..... 77

Table 40: Continuing Online Charter Enrollees Compared to One Year Enrollees – Marginal Results, Math ..... 78

Table 41: Future Online Charter Choosers, Reading..... 79

Table 42: Future Online Charter Choosers, Math..... 80

Table 43: Correlations of School-Level Effects with Survey Responses, Math and Reading..... 82

## List of Acronyms & Definitions

CMOs	Charter School Management Organizations
CREDO	Center for Research on Education Outcomes
EOC	End-of-Course Exam
ELA	English Language Arts
ELLs	English Language Learners
FERPA	Family Education Records Privacy Act
NAEP	National Assessment of Educational Progress
TPS	Traditional Public School
VCR	Virtual Control Record
Asynchronous	Learning that occurs when students complete assignments and learning on their own time and schedule without live interaction with a teacher
Brick-district	A public school operated by a traditional school district which uses standard in-person learning as its primary means of curriculum delivery (aka – TPS)
Brick-charter	A public school operated under a charter as defined by the state which uses standard in-person learning as its primary means of curriculum delivery
Online charter	A public school operated under a charter as defined by the state which uses online learning as its primary means of curriculum delivery
Online district	A public school operated by a traditional public school district which uses online learning as its primary means of curriculum delivery
Growth	The year-to-year change in academic performance relative to one’s peers. Growth can be positive or negative.
Network	A network is defined as a single organization which oversees the operation of at least three charter schools. Not all the schools in a network must be online for the schools to be considered part of a network.
Online School	A school which offers a full-time online curriculum to the majority of its students

Synchronous Learning that occurs with all students in a class receiving instruction and completing work at the same time. Students do not necessarily have to be in the same location for synchronous work.

# Online Charter School Study

## 2015

### 1. Introduction

#### Purpose of Study

The Center for Research on Education Outcomes (CREDO), Mathematica Policy Research, and the Center on Reinventing Public Education (CRPE) have undertaken a collection of studies to contribute more extensive information on the landscape and operation of online charter schools and their impact on students' academic growth than has been available to date. Our aim was to deliver an unbiased, data-driven examination of online charter schools. The intent of this report is to present to lay-readers and policy decision makers information based on advanced statistical models of student growth in a manner which is accessible and useful for the promotion of deeper discussion of the role of online schools in the K-12 setting. This report presents the findings about impacts of online charter enrollment on the academic progress of students.

#### Need for the Study

Online schools, especially online charter schools, are a tiny, but rapidly growing sector in the education realm. Full-time online schools are still a relatively new phenomenon, and some states have seen enrollment growth which is literally exponential. While the overall percentage of students who attend online schools is small, only 0.5% of students in our data, based on increasing growth rates we should expect to see continued expansion of online educational services. The online schools within our 18 state data set have increased their tested student enrollment from 35,000 students in 2009-10 to over 65,000 students in 2012-13. Based on even modest funding levels of \$6,000 per student, 65,000 students represents a public investment of \$390,000,000 annually. With the number of students expected to continue to grow rapidly, good stewardship demands an examination of the outcomes of public investment.

Online schools may be a good investment of these millions of dollars if they can provide quality education to students, especially those students poorly served by the current education system. Online schooling options have the potential to provide students a flexible, student-centered educational option.

One of the desirable attributes of online schools is their adaptability for atypical students. Across the country, there are students who work to provide for their families. There are other students who are who are already active in their chosen professions such as actors, artists, or Olympic hopefuls. These students could also benefit from a flexible, portable means of receiving their education. For migrant students or those in unstable households, the ability to sustain a consistent schooling environment could greatly

boost educational outcomes. Likewise, students who learn at a greatly different rate from their age peers (both slower and faster) might benefit from the self-paced nature of many online programs.

Despite these potential benefits, online learning may not be a good fit for many students. Only high quality, rigorous research will provide the data necessary to address such policy questions.

In spite of the rapid growth of the online sector, there have been few detailed longitudinal analyses on the impact of online schools on academic achievement. Many states have little data on the number of online programs that operate within their state or who they serve. Basic identification data on online schools turns out to be a challenge to collect. Without reliable information on school performance, policy makers, school officials, and families risk the future learning and career opportunities of students in an uncharted arena. Since online learning at the K-12 level is still in its infancy, measures of the quality of the available online school options can provide feedback to educational stakeholders, including authorizers and providers, about program performance that can shape the field as it evolves.

### Questions to Be Addressed

This report presents the findings of an ambitious scope of analysis about online charter schools and their performance. The findings look at performance at several levels: at the individual student level, at the student population level, at the organizational level of the online schools and at the state policy level. Each facet of the analysis offers its particular insights about the influence of online charter schooling on the students who attend them.

For this study, we examine the impact of attending an online charter school on the academic progress of students who attend them. We measure academic impact by comparing the annual academic growth of online students with the growth of equivalent students who attend schools with traditional settings, i.e. brick-and-mortar district schools. This question, “What is the average impact of attending an online charter school on the academic growth of students?” frames the analysis and drives the discussion of results throughout the report. We assess how academic growth in online charter schools differs for students with different student backgrounds including race-ethnicity, poverty status, and exceptional needs.

Online schools may be the best option for some students. Alternatively, it may not be the best option for every student. Are there students who are better suited to the online school experience? Looking at the characteristics of the students at the population level, we examine if success in online charter schools is more likely for some students than others.

Attributes of the schools are also new territory for study. We studied differences in the makeup and operation of the schools themselves. Descriptions of these organizations provide a useful chart of the current landscape. Where possible, those differences were incorporated into the impact analyses to discern if school attributes varied with student results. To explore this aspect of the education equation, Mathematica Policy Research developed and administered to school principals a survey of online school characteristics. The survey covered many aspects of school operations including a range of students

served, methods of curriculum delivery, teacher credentials, and parental involvement. In addition to direct analyses of responses, we combined survey responses with student testing data for mixed-methods analyses of these school characteristics. These analyses will allow providers to explore which services currently offered have stronger and weaker relationships with student outcomes.

Finally, under the terms of the Constitution, each state is free to implement public education policies as they wish, including the terms under which online schools operate. The Center on Reinventing Public Education (CRPE) conducted a review of state policies related to online schools. Their review included categorizing state policies and documenting policy changes which could be expected to have an impact on educational outcomes for online school students. The policy findings from CRPE were combined with student-level data for mixed-methods analyses of policy implications on student academic growth. Policy makers should explore these results for policies they may wish to implement or eliminate from their states to maximize to student benefits of online schools.

It is our intent that this study will serve as the foundation for constructive discussions on the role of online schools in the K-12 sector. The findings presented in the rest of the report are by no means exhaustive. There are more questions policy makers and stakeholders need to ask. Are online schools the solution for many of the educational challenges faced by families today or are they a niche option appropriate for only a small group of students with a specific set of characteristics? Is the current regulatory structure for online enrollment properly matching kids with services? Are online schools having a positive impact on students' educational experiences? What additional measures should be used to define "success" for online K-12 schools? Rather this report aims to build a solid evidence base as the first of many analyses.

The report provides a brief description of the approach to the analysis in the following section. The next chapter includes an analysis on the student-level, school-level, and network-level impact of attending an online charter school as well as a mixed methods analysis which combines impact data with school-level information gleaned from a survey of school leaders. The report concludes with a discussion of the implications of the study findings.

## 2. Methods and Data

### Identifying Online Charter Schools

Identifying students enrolled in online charter schools was a challenge. States typically do not record an indicator for students attending an online school. Lists of the schools offering online enrollment in each state proved to be incomplete or non-existent.

CREDO searched for information about online schools and programs from across the country using multiple Internet searches. Information from the International Association for K-12 Online Learning (iNACOL) was the most complete directory we located. We extended the directory with additional contacts with known online providers such as K12. To identify additional potential online schools, we searched the National Center for Education Statistics (NCES) website, the websites of state departments of education, and completed Google searches for terms related to online schools. Our searches included terms such as “online”, “virtual”, “cyber”, and “distance learning” among others.

In creating this list of potential online schools, we found many of the identified schools were not independent schools, but were instead virtual education programs operating under the umbrella of a traditional brick-and-mortar school setting. For several reasons, we decided to exclude these schools: it was impossible to isolate the records of students enrolled in online-programs which were part of a larger brick-and-mortar school and we were concerned that the influence of traditional enrollment of students might influence the behavior of either the operator or the students in the online setting. For the purposes of this study, a student was considered to be attending an online school if the

## WHAT IS AN ONLINE CHARTER SCHOOL?

One of the challenges faced by organizations which push beyond the familiar boundaries is the absence of the common language needed to describe what it is they do. Online charter schools are not an exception to this problem. With the addition of online learning options in the K-12 setting has come a surplus of terms to describe these new types of learning. Most problematically, the virtual schooling sector is so new many of the terms used have differing definitions.

We found many schools using terms like online, virtual, digital, distance, etc. to describe very different types of services. In some locations, a distance learning school fit our definition of an online school, in others distance learning had nothing to do with online delivered education.

For the purposes of this study, an online school is a school which provides the majority of classes (everything except PE, band, or a similar elective) to full-time students through a computer via the internet. Lessons may be synchronous or asynchronous. Lessons may consist of videos, live chat, bulletin boards, or any other common means of electronic communication. But the primary delivery method must be online.



school's enrollment consisted of full-time, online students only.

CREDO contacted each of the identified online schools to verify the status of the program as a full-time online only school. The program also had to have a state school identification number which was unique from any brick-and-mortar school. This means this study does not include the majority of students who take one or more online course while enrolled in traditional brick-and-mortar schools.

Schools were also excluded as an online school if they reported offering a mixed or blended curriculum. As with brick-and-mortar school students taking online courses, the combination of classroom-based and online instruction creates a different educational environment from the one targeted in this study.

To be clear, our data set for online school students is restricted to those students attending public, full-time online schools. After the multiple screens described above, data from 158 online schools was included in the report.

**Table 1: States with Online-Students**

Arkansas	Colorado	Georgia	Minnesota	Ohio	Texas
Arizona	DC	Louisiana	New Mexico	Oregon	Utah
California	Florida	Michigan	Nevada	Pennsylvania	Wisconsin

### Consolidating Student Data from Multiple States

In order to create a national data set for studies of this type, CREDO worked with the state departments of education in 17 states and the District of Columbia. Because each state used its own standards and tests to evaluate student academic achievement, it was necessary for CREDO to standardize the values to make them comparable. CREDO did this by creating a "Bell curve" for each test -- by subject, grade and year --where the average student score on the test becomes the central value, and all other scores are distributed around it. The transformation places each students' performance in relation to all other equivalent tested students, making it ready for comparison with other students. By comparing each student's performance relative to the other students from one year to that same student's relative performance in the next year, CREDO could estimate if the student was growing academically at a rate which was faster, similar, or slower than the rate of their peers.

CREDO was able to combine growth results from multiple grades, states, and years. Even though average academic performance in state A may represent a difference in achievement from the average academic performance in state B, a change in academic performance (growth) of .05 standard deviations in state A and .05 standard deviation change in performance in state B both represent the same level of improvement relative to their peers in the students' home state. This is one of the reasons measurement of academic growth is superior to simple measures of academic achievement; the level of which can vary greatly from state to state.

## Multiple Datasets

### Matched Data

CREDO conducted analyses using its Virtual Control Record (VCR) method. The first step in conducting a VCR analysis is to create a matched data set. The matched data set consists of treated students (in this case students attending an online charter school) and demographically identical students in the control group. CREDO established two control groups for this analysis. The first was a traditional control group of students who attend a brick-and-mortar school operated by a traditional school district (brick-district). These schools are those normally referred to in CREDO's studies as TPS. Due to the dual nature of the treatment group, both online and charter, it was beneficial to make comparisons between the treated students and brick-and-mortar traditional schools and treated students and brick-and-mortar charter schools. This necessitated the creation of a second matched comparison group with students attending brick-charter schools as the control group. This comparison group allowed CREDO to examine the "online-ness" of an online charter school as compared to physical charter schools.



[Click here for an infographic about the Virtual Control Record method.](#)

At the outset of the study, it was hoped a third comparison group would focus on the "charterness" of the online charter by creating a dataset with students who attended online schools operated by districts as the control group. Unfortunately, the number of students who attend online-district schools is too small to allow for an acceptable online charter/online-district matched dataset.

### Selection of Comparison Observations

A fair analysis of the impact of online charter schools requires a comparison group which matches the demographic and academic profile of online charter students to the fullest extent possible. As in previous CREDO studies, this study employed the virtual control record (VCR) method of analysis developed by CREDO. The VCR approach creates a "virtual twin" for each online charter student who is represented in the data. In theory, this virtual twin would differ from the online charter student only in that the student attended an online charter school. The VCR matching protocol has been assessed against other possible study designs and judged to be reliable and valuable by peer reviewers.<sup>1</sup>

Using the VCR approach, a "virtual twin" was constructed for each online charter student by drawing on the available records of traditional public school (TPS) students with identical traits and identical or very

---

<sup>1</sup> Forston, K. and Verbitsky-Savitz, N. et al. (2012). "Using an Experimental Evaluation of Charter Schools to Test Whether Nonexperimental Comparison Group Methods Can Replicate Experimental Impact Estimates," NCEE 2012-4019, U.S. Department of Education.

similar<sup>2</sup> prior test scores who were enrolled in TPS that the charter students would have likely attended if they were not in their online charter school. To better isolate the effect of attending an online charter school as opposed to just a charter school, a second VCR data set was created. For the second data set a “virtual twin” was constructed for each online charter student by drawing on the available records of brick-and-mortar charter school students with identical traits and identical or very similar prior test scores who were enrolled in brick-and-mortar charter schools that the charter students would have likely attended if they were not in their online charter school. The second VCR data set using brick-and-mortar charter school students to form the VCRs allowed CREDO to differentiate between the effects of online charter school attendance compared to just charter school attendance. If the effect sizes for online charter students compared to TPS VCRs was found to be similar to the effect sizes for online charter students compared to brick-and-mortar charter VCRs, the effect sizes would be primarily attributable to the online nature of the school.

Factors included in the matching criteria were:

- Grade level
- Gender<sup>3</sup>
- Race/Ethnicity
- Free or Reduced-Price Lunch Eligibility
- English Language Learner Status
- Special Education Status
- Prior test score on state achievement tests

Figure 1 shows the matching process used by CREDO to create the virtual twins linked to each online charter school student. In the first step, CREDO identifies all TPS with students who transferred to a given charter school. These schools are referred to as “feeder schools” for that particular online charter school. Students attending an online charter school are eliminated from the match pool for each charter student to ensure VCRs consist entirely of TPS students. The feeder school method provides a strong counterfactual as residential school assignment commonly used to place students in TPS has been shown to group demographically and socio-economically similar students into schools. This practice increases the likelihood that students assigned to similar schools have similar backgrounds, knowledge of school choice programs, and school choice options. Once a school is identified as a feeder school for a particular online charter, all the students in that TPS become potential matches for students in that particular charter school. All of the student records from all of a charter’s feeder schools were pooled – this became the source of records for creating the virtual twin match<sup>4</sup>.

---

<sup>2</sup> Achievement scores were considered similar if they were within 0.1 standard deviations of the online charter student’s pre-online charter achievement.

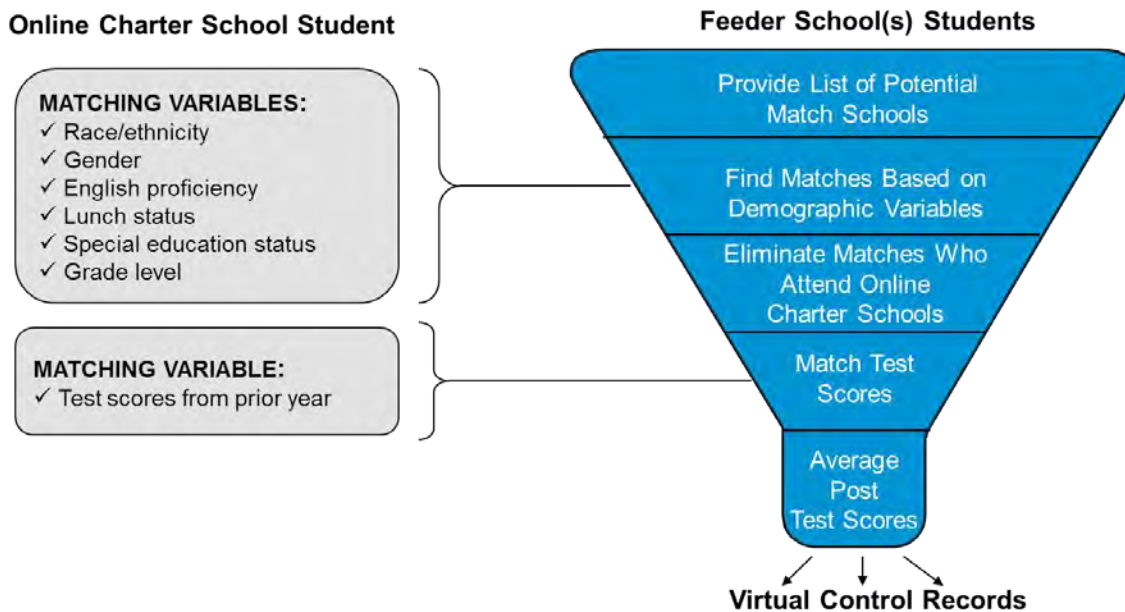
<sup>3</sup> Gender is used as a match factor for all states except Florida due to lack of data availability.

<sup>4</sup> Each charter school has its own independent feeder list, and thus a unique pool of potential VCR matches.

The VCR matching method then eliminates any of the TPS students from the match pool whose demographic characteristics do not match exactly to the individual online charter student. As part of the match process, we also drop from the TPS match pool any students who enrolled in an online charter school in subsequent comparison years.

Using the records of TPS students at feeder schools in the year *prior* to the first year of growth, CREDO randomly selects up to seven TPS students with identical values on the matching variables in Figure 1, including identical or very similar prior test scores. Students with similar test scores were used only when there were not enough TPS students with exact test score matches. The values for the selected TPS students are then averaged to create values for the virtual twin. As all other observable characteristics are identical, the only observable characteristic that differs between the online charter student and their VCR is attendance in an online charter school. The prior test score represents the impact on academic achievement of both the observable and unobservable student characteristics up to the time of the match, the year before the first growth measurement. Since we matched on observable characteristics and the prior test score, we concluded that any differences in the post-test scores are primarily attributable to online charter school attendance. The same process was used for the brick-and-mortar VCR match except feeder list was based on transfers from brick-and-mortar charter schools to online charter schools.

Figure 1: CREDO VCR Methodology



[Brick-District VCR Matched Sample](#)

As stated above, this report uses two VCR groups. The first VCR data set created for these analyses matched online charter students with students from traditional brick-and-mortar district-run schools (TPS). Due to the large number of feeder schools sending students to online schools, this data set had an

exceptionally high match rate<sup>5</sup>. The online charter to brick-district match rate was 96 percent. As a result, the sample included in this analysis is highly reflective of the full population of online charter students for the states included in the impact analysis.

Table 2 shows the characteristics of the student bodies in the online charter schools, the TPS feeder schools, and all TPS schools for the states included in the impact analysis. The major difference between the online charter students and the students attending feeder schools is the percentage of White students enrolled in the online charter schools (69%) is much higher than the feeder schools (45%). The difference in the percentage of White students is offset by a decrease in the percentage of Hispanic students. As would be expected, this also leads online charter schools to serve a much smaller percentage of English language learners (1%) than the feeder schools (9%). Since written communications are the major form of interaction between students and teachers in many online settings, it should not be surprising to find a lower percentage of English language learners (ELL) in online charter settings. We cannot determine whether lower ELL enrollment in online schools is the cause of lower Hispanic student enrollment or an effect of lower Hispanic student enrollment.

**Table 2: Student Population Demographics by TPS Sector**

	All TPS	TPS Feeder Schools	Online Charter Schools
Number of Schools	108,476	11,574	166 <sup>6</sup>
Percent Students in Poverty	39%	51%	48%
Percent English Language Learner Students	8%	9%	1%
Percent Special Education Students	8%	11%	11%
Percent White	49%	45%	69%
Percent Black	15%	13%	13%
Percent Hispanic	27%	32%	11%
Percent Asian/Pacific Islander	5%	6%	2%
Percent Native American	1%	1%	1%
Percent Multi-Racial	3%	3%	4%
Average Total Enrollment per School	503	772	986
Total Enrollment	54,602,134	8,933,313	163,722

The brick-district VCR population had a special education student rate identical to the feeder schools. This rate is slightly higher than the rate of special education students enrolled in all TPS schools across the states included in the study. Online charter schools serve a slightly smaller percentage of students in poverty, those eligible for free or reduced lunches, than the feeder schools, but a higher percentage than all TPS schools. The average total enrollment for online charter schools is larger than all TPS feeder schools.

<sup>5</sup> Match rate was the percentage of online charter students with at least a student in the comparison school who was an exact match on demographics and a close/exact match on prior achievement.

<sup>6</sup> Includes some multi-campus schools with separate IDs, but one administration.

Some states have a large number of students who supplement their course work by taking one or more classes via online methods. These students were **not** included in the treatment group as the impact of their online education could not be separated from their traditional class work. Additionally, students from schools which offer online study in addition to other forms of distance education were not included unless the school had a separate school identifier for just the online students.

#### Mobility Study Data Set

One of the analyses included in this report focused on student mobility. The data set for the mobility portion of the report consists of all of the online charter students' available records from the 2007-2008 school year through the 2012-2013 as well as all of the records for all the TPS students included in the VCR for any online charter student. The data set was constructed by appending the data for each year of the study for each state included in the study. Within each state, all students who were either an online charter student or selected to be part of any online student's VCR were flagged based on the records from the VCR match process. Once all the student records were properly marked, the files from each state were appended together to form a national panel data.

As should be expected, the characteristics of the VCR students and the online charter students are similar (see Table 3). The only reason the two samples are not identical as they are in a standard matched VCR data set is because the VCR students are not combined in a single value. In the traditional VCR matched data set, the TPS students who make up the VCR are combined into one value. This means for each Hispanic student charter student, there is one Hispanic VCR. However, in the mobility data set, the VCR students are not combined. There could be five Hispanic VCR students for one Hispanic charter student. The differing number of VCR students assigned to each charter student allows for some variance between the percentages of students by demographic categories. As part of the VCR match process, online students are matched multiple times based on the number of years the student appears in the data set. For analysis, only the matches from the longest time period are included in the VCR. For this data set, the students who make up the VCR from each match are included. This is why the ratio of VCR students to online charter students is higher than the 7:1 maximum ratio used for the standard VCR matched data set.

**Table 3: Student Record Demographics for Mobility Study**

	All TPS	VCR Students	Online Charter Students
Percent Students in Poverty	39%	56%	53%
Percent English Language Learner Students	8%	3%	2%
Percent Special Education Students	8%	8%	10%
Percent White	49%	73%	69%
Percent Black	15%	12%	12%
Percent Hispanic	27%	11%	13%
Percent Asian/Pacific Islander	5%	2%	2%
Percent Native American	1%	0%	1%
Percent Multi-Racial	3%	1%	2%
Total Enrollment	54,602,134	4,697,266	500,836

The mobility data set includes a record for each year a student has a test score. Students may remain in the data set for a different number of years based on their grade in a given year, the testing regimen of the state of residence, and the students’ interstate mobility patterns. The records for a single student are labeled by period. The first period record for a student is the earliest record chronologically. In the mobility data set, it was possible for students to have up to six individual year records. Table 4 includes the number of records in each period and what percentage of the data set is encompassed by each period.

**Table 4: Number and Percentage of Records per Period**

Period	N of Students	Percentage of Total Students
1	1,135,139	22%
2	1,134,562	22%
3	1,044,064	20%
4	881,526	17%
5	630,200	12%
6	294,949	6%

**Basic Analytic Model**

The primary question for this study is “How did enrollment in an online charter school affect the academic growth of students?” To answer this central question, we need to address multiple lines of inquiry around enrollment in an online charter school. For example, we explore, “How did the academic growth of online charter school students compare to students who are just like them but instead attended traditional public schools (TPS)?” As there has been little work in this research area, we believe

our work will support the policy discussions about this rapidly expanding educational trend by extending the pool of knowledge on online charter school effectiveness.

Appendix A includes a more detailed descriptive analysis with the demographic make-up of the tested students who were enrolled in the online charter sector. We include analyses of the demographics of students in the data set. This discussion provides information on the percentage of students representing each race/ethnicity, eligibility for free or reduced priced lunches, English language learners, and special education students.

The primary methodological challenge associated with any study of charter schools is selection bias. Even after controlling for student characteristics such as gender, poverty, race, and ethnicity, the fact that some students choose to enroll in charter schools and other students do not may indicate the existence of some unobserved difference between the two groups of students. The ideal solution to this problem is a randomized experiment that creates a control group that is identical to the treatment group before entering the online charter school. Several charter school studies have used admissions lotteries in oversubscribed charter schools to conduct randomized experiments. The approach is not applicable to most charter schools and especially not online charter schools as enrollments in online charter schools are not constrained by physical space, thus they usually have no need to allocate seats by a lottery.<sup>7</sup>

In the absence of a randomized experiment, several recent studies have demonstrated that it is possible to successfully address selection bias by accounting for students' prior academic achievement levels before entering charter schools (Gleason et al. forthcoming; Furgeson et al. 2012; Fortson et al. 2015). The three previous studies of the achievement effects of online charter schools used variations on this approach. Unfortunately, however, it is not clear that the approach can succeed in eliminating all selection bias in the context of online schools. Because online schools differ radically from brick-and-mortar schools, the students who enroll might be quite different from those enrolling in conventional schools. For example, some students might enroll in online schools because they have had significant academic, behavioral, or social problems in conventional schools, which may, in turn, affect their later achievement trajectories. If so, prior scores might not be predictive of future scores, regardless of whether a student stays in a conventional school or moves to an online school.

Given the uncertainties about whether online schools are subject to unique kinds of student selection, we used several different analytic approaches to test the sensitivity of findings to modeling approaches. The first approach uses virtual control records (VCRs) method developed by CREDO (Davis and Raymond 2012), involving virtual controls that closely mirror the matched charter school students on known demographic attributes, eligibility or participation in special support programs (free or reduced-price lunch, English language learners, or special education), and prior academic achievement. In order to determine the impact of attending an online charter school on student academic growth (the change in

---

<sup>7</sup> Although a small number of online charter schools have enrollment constraints and hold admissions lotteries, it would be impossible to generalize from a study of the few online schools in such circumstances.



academic achievement), we employ statistical models which compare online charter students to their virtual twins. The virtual twins represent the expected performance of charter students had they not enrolled in online charter schools. Due to the dual nature of online charter schools, we include in this study findings for online charter students compared to brick-district VCRs and online charter students compared to brick-charter VCRs. The VCR method has been shown to produce results similar to those obtained with randomized control trials and student fixed-effects approaches (Davis and Raymond 2012), such as those used in several published studies of charter-school impacts (for example, Bifulco and Ladd 2006; Booker et al. 2007; Zimmer et al. 2003, 2009).

The second approach uses a method that has been validated experimentally in a study of charter management organizations (CMOs) (Furgeson et al. 2012). That study demonstrated that an ordinary least squares (OLS) regression that controls for demographic characteristics and prior academic achievement before entering a charter school produces results that are nearly identical to the results of randomized experimental analyses using admissions lotteries.

In addition, we use two parallel analytic approaches designed to address the student selection that is unique to online schools. Both of these approaches use comparison groups consisting of students who enrolled in online schools at some point in their academic careers. These models recognize the key conclusion from the nonexperimental evaluation literature that the validity of a comparison group depends on its similarity on key characteristics (Cook et al. 2008). In the context of online schooling, an important characteristic is the student's willingness to enroll in an online school. Selecting a comparison group of students who have enrolled in an online school at some point in time is one way to account for this characteristic. We describe these models as "chooser-matched" designs.

The first chooser-matched design employs a method that has previously been used to measure charter-school effects on students' academic attainment (Booker et al. 2011). This approach identifies the effect of online schools by comparing the difference in achievement trajectories of two groups of students who are enrolled in online schools in the same grades and years. The difference occurs after one group subsequently switches to brick-and-mortar schools and the other does not. We identify the effect of online schools by comparing the achievement trajectories of students who switched to brick-and-mortar (the comparison group) and students who remain in online charter schools (the treatment group), while controlling for any observable differences between the groups in the year before the switch.

The second "chooser-matched" designs uses a comparison group of students who are enrolled in brick-and-mortar schools during the period of treatment, but who are known to enroll in online schools later in the data set. This method, in essence, compares the achievement trajectories of current online students (the treatment group) with those of future online students (the comparison group), again controlling statistically for any observable differences between the groups. This method has been used in the past in an evaluation of after-school programs conducted for the U.S. Department of Education (Zimmer et al. 2007). As with the first chooser-matched method, this approach has the virtue of

identifying a comparison group of students who have also chosen to enroll in online schools, only at a different point in time.

The main body of the report contains results for the brick-district VCR analysis. Results for each set of additional analyses are explained in a separate subsection of Appendix B.

#### Mixed Methods Analysis

For this portion of the study, we merged information obtained from the online charter school survey administered by Mathematica Policy Research (Mathematica) with student-level test data and school-level effect sizes. These processes allow for the analysis of the relationship between school characteristics and student academic growth for the schools which have both student data and survey responses. The models used for this section are not causal models, so we are describing a relationship between two factors rather than claiming one factor causes the other. The Mathematica survey covers a wide variety of school practices. These practices, described in detail in Volume 1, include pedagogical concerns such as the method of curricula delivery, family issues such as expected parental participation, and school practices such as providing equipment or internet connectivity to students' homes.

This report includes two levels of mixed-methods analyses. The first correlates school-level average effect sizes with data from the survey conducted by Mathematica. The second mixes student growth data with school-level characteristics gleaned from the survey.<sup>8</sup> The survey includes data on school characteristics such as size, location, operational practices, expectations for parents and students, and expectations for teachers.

Some of the questionnaire items are restricted to students of a certain grade. Other items are general and applied to all schools regardless of grades served. Because a particular educational practice might have differentiated impacts for younger students compared to older students, the survey includes a set of responses for 4<sup>th</sup> grade students, 7<sup>th</sup> grade students, and high school students. These grade levels were picked to be representative of elementary school, middle school, and high school respectively. Using this system enables the researchers to tease out the differing relationships of a particular school-wide procedure on students of different ages. It also allows for schools which have differing procedures for students based on the students' ages. The survey question with the smallest number of students contains responses from schools which collectively serve over 13,000 individual students.

The number of schools with average effect sizes and data responses was small. Only 60 schools had both school-level effects and data responses. Further, some questions were not applicable to some schools because of the grade range of the students in that school. This greatly limits the generalizability of the findings.

---

<sup>8</sup> By including the student-level analysis, we were able to increase the analytic power of the statistical models. Additionally, using student-level analyses allowed us to control for the differing characteristics of the students within each school.

## Presentation of Results

In this report, we present the impacts of attending charter schools in terms of standard deviations. The base measures for these outcomes are referred to in statistics as z-scores. A z-score of 0 indicates the student's achievement is average for his or her grade. Positive values represent higher performance while negative values represent lower. Likewise, a positive effect size value means a student or group of students has improved relative to the students in the state taking the same exam. This remains true regardless of the absolute level of achievement for those students. As with the z-scores, a negative effect size means the students have on average lost ground compared to their peers.

It is important to remember that a school can have a positive effect size for its students (students are improving) but still have below average achievement. Students with consistently positive effect sizes will eventually close the achievement gap if given enough time; however, such growth might take longer to close a particular gap than students spend in school.

While it is fair to compare two effect sizes relationally (i.e. 0.08 is twice 0.04), this must be done with care as to the size of the lower value. It would be misleading to state one group grew twice as much as another if the values were extremely small such as 0.0001 and 0.0002.

Finally, it is important to consider if an effect size is significant or not. In statistical models, values which are not statistically significant should be considered as no different from zero. Two effects sizes, one equal to .001 and the other equal to .01, would both be treated as nil if neither were statistically significant.

To assist the reader in interpreting the meaning of effect sizes, we include an estimate of the average number of days of learning required to achieve a particular effect size. This estimate is based on findings by Hanushek, Perterson, and Woessman (2012) that "student growth is typically about 1 full standard deviation on standardized tests between 4<sup>th</sup> and 8<sup>th</sup> grade, or about 25 percent of a standard deviation from one grade to the next."<sup>9</sup> This transformation is approximate and dependent on estimates of average annual academic growth. Another study on the topic (Hill, Bloom, Black, and Lipsey, 2008) derived differentiated rates of growth by grade which would result in a lower number of days of learning for our estimates. While we evaluate the use of a more sensitive measure for computing days of learning, we continue to use the values from Hanushek et al. to maintain consistency with previous CREDO reports.

---

<sup>9</sup> Using a standard 180 day school year, each 0.01 sd change in effect size is equivalent to 7.2 days of learning.

### 3. Student Mobility

Because students generally do not start school in an online setting, it is clear that students attending online charter schools may have a higher mobility rate than students in a traditional public school. The mobility rates of students matter because high mobility can be correlated with lower academic growth (Hanushek, Kain, & Rivkin, 2004) as well as higher likelihood of dropping out of school (South, Haynie, and Bose, 2007). Mobility can be a tricky variable to follow because many states report a student's enrollment at specific times of the year such as beginning of school and testing day, but do not report changes which occur between those times. To estimate mobility, CREDO linked student records longitudinally across the years of this study. Students were identified as being mobile if they experienced a non-structural school change from one testing year to the next. A non-structural school change is one which does not occur because the student aged out of their previous school. This method likely underestimates the number of students who voluntarily changed schools because it does not capture students who wait until a structural change to move to a new district or a school other than the one they would have attended. However, those students were going to experience a school change no matter the choices they made, so the impact of the voluntary school change may not be greater than the forced school change the student was going to have to make anyway.

As part of the discussion on mobility, CREDO also examined the characteristics of new online students in charter schools. Our view is constrained by the testing patterns of the various states which typically exclude the early elementary grades and are sporadic in the high school years.

In addition to straightforward comparisons of mobility rates between online charter students and brick-and-mortar students, we were also able to investigate questions such as:

1. How many years do online students remain in online charter schools?
2. What is the percentage of online students who return to brick-and-mortar schools after attending an online school?
3. What grades are students in when entering an online school?
4. What grade are students in when they leave an online school?

These questions further the understanding of the experience of online charter students.

#### Characteristics of Online Charter Mobility

Some online charter school operators state that their students come to them with additional academic deficits beyond the typical student. Often they cite the students' history of mobility as a cause for these deficits. If it were true that students arrive at online schools with academic deficits created by high mobility, we would expect to find online students experienced higher mobility before switching to the online school than the comparison students. In fact, students who switched to online schools have a pre-online school mobility rate of nine percent compared to eight percent of the comparison students. These findings place doubt on the argument that higher pre-online mobility creates widespread, systematic academic deficits for students who eventually switch to online charter schools.

The data in Table 5 shows the entry grade of students who transitioned to an online charter school. Students enroll in online charter schools at different points in their academic careers. Since all the states included in the analysis require students to test from grades 3 – 8, these grades are comparable and show the relational pattern between student age and online charter enrollment. There is a steady increase in the number of students enrolling in online charter schools as students age into middle school. The large drop off in enrollments in 9<sup>th</sup> grade is likely an under estimate due to state testing patterns.

**Table 5: Grade at Initial Enrollment in Online Charter School for New Entrants**

Grade	N	Percentage
K-3	13,815	11.3%
4	12,587	10.3%
5	13,380	10.9%
6	17,691	14.4%
7	21,943	17.9%
8	18,147	14.8%
9	5,243	4.3%
10	13,669	11.2%

Nearly one-half of students in our study (47 percent) are enrolled in an online charter school for one year. This number must be tempered with the fact 19 percent of the individuals in the study enrolled in an online charter school for the first time in 2012-2013. Students whose first entry into an online school is 2012-2013 can only have one year in an online charter school. On average, online charter students in our study spend two years in online schools. Table 6 includes information on the percentage of students who remained in an online charter school categorized by the students’ entry year into an online charter school.

**Table 6: Duration of Student Enrollment in Online Charter Schools by Entry Year**

Entry Year	1 Year	2 Years	3 Years	4 Years	5 Years
2008-2009	100%	65%	43%	29%	16%
2009-2010	100%	63%	39%	23%	
2010-2012	100%	58%	34%		
2011-2012	100%	56%			
2012-2013	100%				

Obviously, the students first entering an online charter school in 2012-2013 school year cannot be included in a discussion of persistence trends as many of those students may be shown to continue on past one year once more data is available. An examination of the first four years shows a decreasing percentage of students are remaining in online charter schools for a second year. This decrease has coincided with an increase in the number of students enrolling in online charter schools.

Table 7 includes the percentage of individual students in each state who remained enrolled in online charter schools for a given number of years. In some states, online schools have not existed long enough for students to have accumulated more than a few years in an online school.

**Table 7: Percentage of Online Students Remaining in Online Charter Schools by State**

State	1 Year	2 Years	3 Years	4 Years	5 Years
AR	100%	64%	32%	16%	6%
AZ	100%	37%	16%	7%	3%
CA	100%	57%	29%	16%	8%
CO	100%	48%	21%	9%	4%
DC	100%	72%	28%	11%	3%
FL	100%	19%	1%	1%	0%
GA	100%	60%	23%	11%	4%
IL	100%	83%	42%	20%	7%
LA	100%	39%	-	-	-
MI	100%	54%	14%	-	-
MN	100%	51%	23%	13%	5%
NM	100%	50%	15%	9%	-
NV	100%	50%	22%	9%	4%
OH	100%	57%	32%	17%	8%
OR	100%	46%	19%	10%	4%
PA	100%	60%	32%	19%	10%
UT	100%	43%	15%	4%	1%
WI	100%	35%	14%	-	-
<b>Total</b>	<b>100%</b>	<b>53%</b>	<b>25%</b>	<b>13%</b>	<b>6%</b>

- Duration not possible in given state

Twenty-three percent of online charter student test scores in the data set were from a year in which the student experienced a non-structural school change. For TPS students, the rate was only eight percent. Of course, one of those moves for online charter students would be for the student to enter the online charter school. This mandatory additional move inflates the mobility rate for online students. Even after we remove the initial move to the online school from the estimate, students who attend an online charter school still have a mobility rate of 15 percent, almost twice the rate of the VCR students. As we did not find higher mobility for online charter students before transferring to an online charter, the conclusion is that online charter students have more mobility after transferring to an online charter school. Table 8 shows the mobility rates for online and traditional students by state. The full online results include the switch to the online school. The limited online percentages include all school switches for online students except the initial switch to an online school. The full traditional values are the rates for the comparison students. In most states even after removing the triggering school switch to an online charter school, students attending online charter schools still have mobility rates of at least 1.5 times the rates of the comparison students in that state (column 5 of Table 8).

**Table 8: Mobility Rates for Students by Sector and State**

State	Full Online	Limited Online	Full Traditional	Comparison Ratio <sup>10</sup>
AR	14%	8%	5%	1.60
AZ	28%	21%	10%	2.10
CA	23%	16%	8%	2.00
CO	29%	20%	8%	2.50
DC	23%	18%	11%	1.64
FL	29%	17%	10%	1.70
GA	20%	12%	9%	1.33
IL	16%	10%	6%	1.67
LA	23%	11%	8%	1.38
MI	22%	16%	10%	1.60
MN	24%	15%	5%	3.00
NM	23%	19%	7%	2.71
NV	24%	15%	8%	1.88
OH	18%	12%	7%	1.71
OR	26%	16%	7%	2.29
PA	22%	13%	6%	2.17
UT	26%	17%	7%	2.43
WI	21%	10%	2%	5.00
Total	23%	15%	8%	1.88

A portion of the difference in mobility stems from the return of many online students to traditional schools after a period of time. Using testing data, online students were flagged as returning to the traditional sector if they have a test in a non-online school after they complete a test in an online charter school. The rate of return for unique students from the online charter setting to a traditional setting is 22 percent. One-in-five students who use online education eventually return to a traditional setting within the data window. Table 9 shows the percentage of online students who return to traditional settings remains steady as the number of students enrolling in online charter schools increases. Please note the rates in Table 9 of students returning from an online charter to a traditional setting is lower than the 22 percent figure given. This is because the 22 percent figure is for unique students; whereas the annual figures include multiple records for students with multiple years in an online school. Since 2009-2010, the annual percentage of students returning to the traditional setting has remained steady.

<sup>10</sup> Comparison ratio=limited online mobility rate/full traditional mobility rate

**Table 9: Annual Rates of Return from Online School to Traditional Schools**

Year	Online Charter Enrollment	Percent Returning to Traditional Setting
2008-2009	16,102	‡
2009-2010	32,620	16%
2010-2011	35,984	16%
2011-2012	43,471	16%
2012-2013	52,843	17%

‡Prior online charter status not available for all students.

Table 10 includes data for online charter students who leave an online charter school and return to TPS. As would be expected, grades in which students return to TPS has a similar but slightly lagged pattern as the grades when students enter online charter schools. Online charter students who return to TPS are most likely to do so in their 8<sup>th</sup> grade year.<sup>11</sup>

**Table 10: Grade on Return to TPS from Online Charter School**

Grade	N	Percentage of Total Returns
4	2,889	11.3%
5	3,490	13.7%
6	4,568	17.9%
7	5,524	21.7%
8	6,240	24.5%

The mobility rate for students’ post-online school years are extremely high. Even after eliminating the switch from the online school to the traditional setting, former online students have a mobility rate of 36%. This suggests students who leave online schools have a more chaotic school experience post online.

### Mobility and Student Characteristics

Another question related to mobility is whether student demographic characteristics are related to mobility. To examine this, CREDO compares mobility rates for students separated by race-ethnicity, poverty status, ELL status, and special education status.

### Mobility by Race-Ethnicity

Mobility varies greatly by the race-ethnicity of the student. Minority students, black students especially, have a history of high mobility between schools. High levels of mobility, or the life issues causing high levels of mobility, are likely related to lower academic performance. Among the VCR students in the mobility data, this same pattern holds true. White and Asian VCR students have an average mobility rate

<sup>11</sup> It should be noted the drop off in students returning to TPS in the upper grades could be due to fewer tests being given in those grades. Students who return to TPS after 8<sup>th</sup> grade may not be included since the lack of upper grade tests would mean those students would not be in the data set.



of just 6 percent. Hispanic, Native American, and Multi-racial students have mobility of 10 percent. Black students have the highest mobility rate among the VCR students at 13 percent. The Black VCR mobility rate is twice that of the White and Asian students.

The patterns are quite different for the students in online charters. In addition to being higher overall, 23 percent for online charter students vs. 8 percent for VCR students, the disparity between white students and minority students is much smaller for online charter students. This shift in the differences between groups is being driven primarily by the higher mobility rates for white students enrolled in online charter schools. The mobility rates for each group of students is shown in Table 11. The comparison ratio is the relative difference between online charter student rates and VCR student rates. The results indicate that White students, and to a lesser extent Asian students, in online charter schools have much less stable educational histories as compared to their VCR counterparts.

**Table 11: Mobility Rates by Race-Ethnicity and Sector**

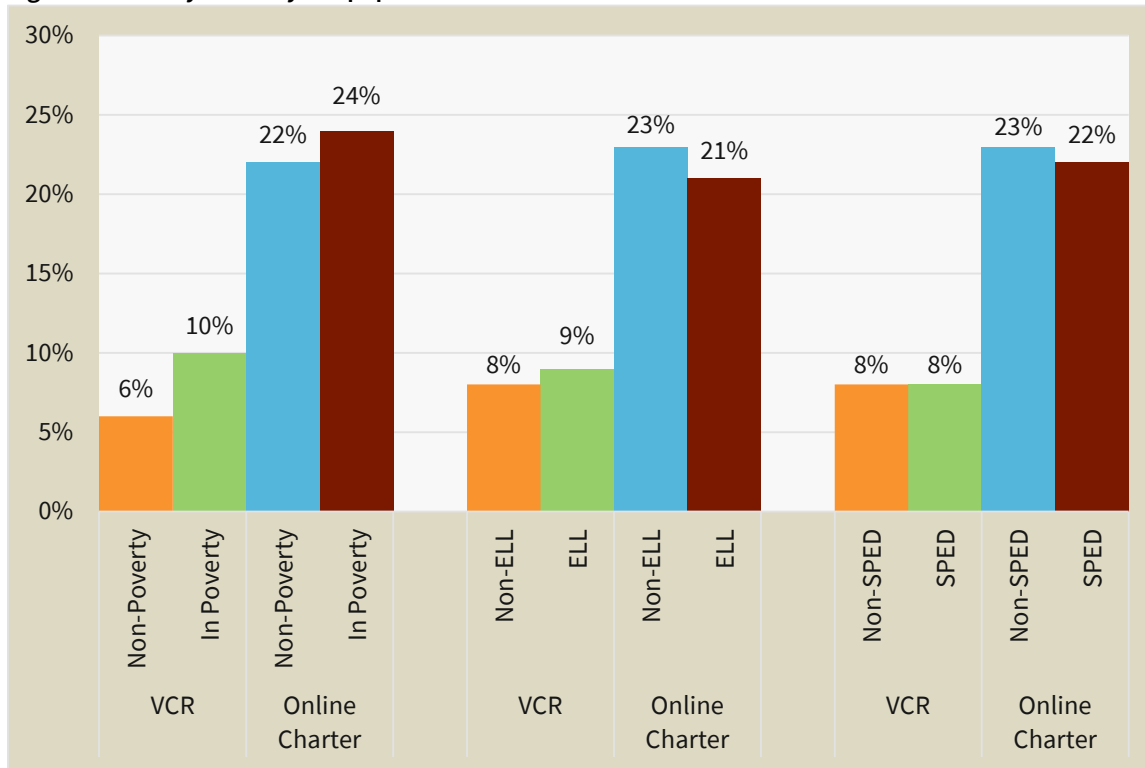
Group	VCR Students	Online Charter Students	Comparison Ratio
White	6%	22%	3.4
Asian	6%	19%	3.2
Black	13%	25%	2.0
Hispanic	10%	26%	2.7
Native American	10%	25%	2.6
Multi-Racial	10%	25%	2.5

**Mobility by Student Sub-populations**

Another set of student characteristics which have been shown to have an impact on educational attainment are students with exceptional needs. These are students who live in poverty, students who are English language learners, and special education students. Being a member of one of these sub-populations often comes with additional educational deficits. These deficits may be impacted by higher rates of mobility. Additionally, disaggregating mobility rates by membership in these sub-populations can provide additional insight to the unique characteristics of the online charter population.

Being an ELL student or special education student should have little direct impact on mobility. There are few direct factors with those characteristics which motivate a student’s family to more frequently relocate to a different school zone. While migrant families do tend to have a higher rate of ELL students, most ELL students are not from migrant families. Poverty, however, has been shown to be highly correlated with high student mobility. Families of students in poverty often live in rental properties rather than owning their homes. This results in a lower transaction cost for moving within a community, so we tend to see many more moves for students in poverty. Students not in poverty generally have more stable home lives with less relocation. Figure 2 includes data for mobility rates of students from the various subpopulations.

**Figure 2: Mobility Rates by Subpopulation**



For online charter students, the mobility rates for ELL and special education students are approximately two-and-a-half times the rate of mobility for the same groups of students in TPS. In fact, the mobility rates are slightly lower for both online charter ELL students and special education students compared to the non-ELL and non-special education students in online charters. But the difference between students in poverty and non-poverty students who attend online charter schools is only two percentage points compared to a four percent difference in the VCR comparison group.

Overall, students who enroll in an online school demonstrate higher overall levels of mobility than VCR students. However, the mobility of online charter school students before they transfer to the online charter is similar to the rate of VCR students. Twenty-two percent of online charter school students eventually return to TPS schools.

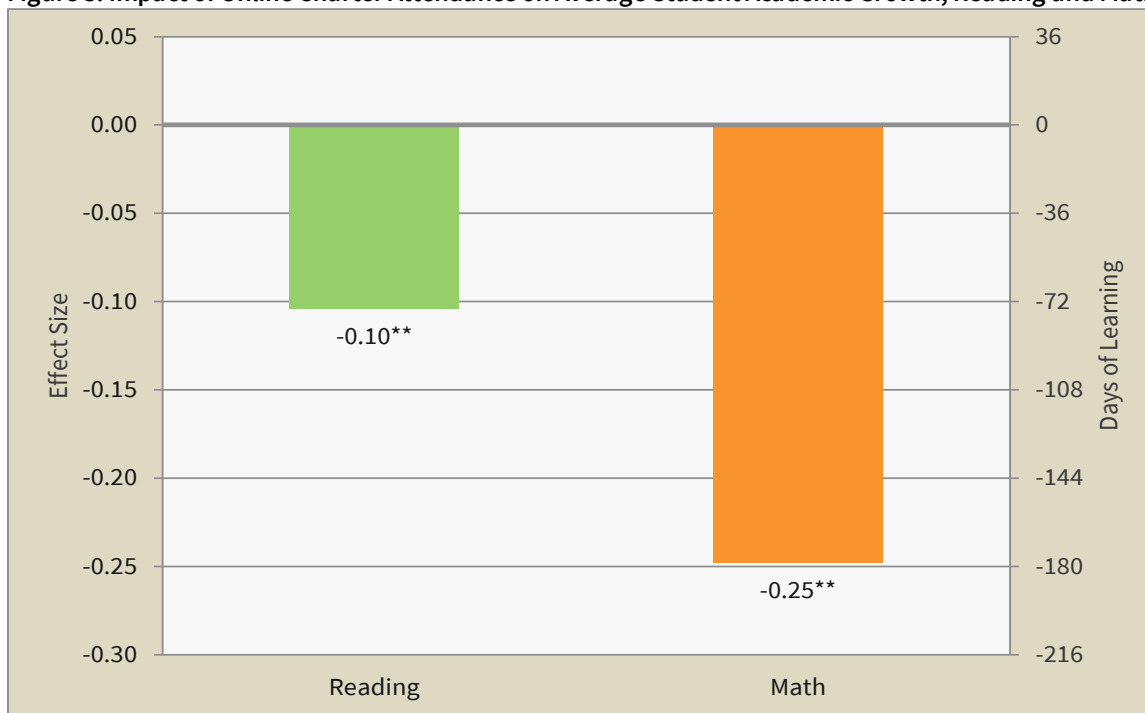
#### 4. Impact Analysis

For the impact analyses, we compare the growth of students in online charter schools to that of their VCRs. This type of analysis provides information about the year-to-year change in achievement relative to that of the rest of the students in the sample. On average, the effect sizes for students attending online charter schools are negative. A negative effect size does not mean the student did not increase in academic achievement. A negative effect size means the student did not advance as much as expected based on the student’s characteristics.

##### Online Charter Students Compared to Brick-District Students

The first set of analyses examines the academic growth of online charter students compared to the matched VCRs made up of students who attended brick-and-mortar district-run schools. These schools are typically referred to as traditional public schools (TPS). Compared to their VCRs in the TPS, online charter students have much weaker growth overall. Across all tested students in online charters, the typical academic gains for math are -0.25 standard deviations (equivalent to 180 fewer days of learning) and -0.10 (equivalent to 72 fewer days) for reading (see Figure 3). This means that compared to their twin attending TPS, the sizes of the coefficients leave little doubt attending an online charter school leads to lessened academic growth for the average student.

**Figure 3: Impact of Online Charter Attendance on Average Student Academic Growth, Reading and Math**



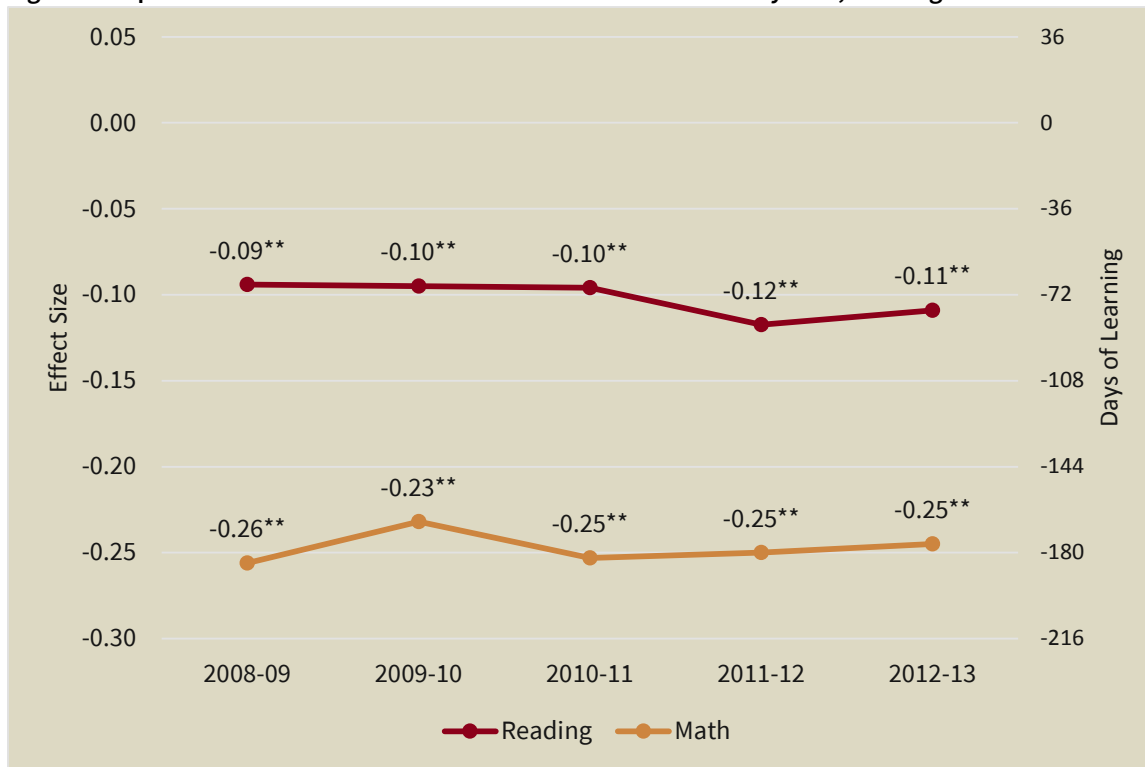
The 0.00 line for this graph represents the average TPS VCR, White, non-poverty, non-ELL, non-SPED student.

\*\* Denotes significant at the .01 level.

These results cover all students with a growth measure (i.e., at least two years of tested performance) in all the states in all the periods. Accordingly these average measures of academic growth reveal that the general case for online charter students is not a positive one. The all-in figures, however mask the story of the underlying distribution. Around the average, some online charters will perform better and some will perform worse than the average. While overall results establish a baseline for discussion, these results are not subtle enough to provide insight for policy implications. A clearer picture of the more granular distribution around the averages along with the student or school factors that are associated with the distribution will add to a general understanding of the situation of online charters.

Figure 4 shows the results of this analysis. There is no consistent trend either upward or downward in the results. Instead the overall effect size in math stays fairly consistent over time. The overall effect size in reading shows a gradual dip, but recovers part of that loss in 2012-13.

**Figure 4: Impact of Online Charter Attendance on Academic Growth by Year, Reading and Math**



The 0.00 line for this graph represents the average TPS VCR, White, non-poverty, non-ELL, non-SPED student.

\*\* Denotes significant at the .01 level.

In the 2009 CREDO charter school study, charter schools had on average weaker growth than their traditional public school counterparts (Raymond, 2009). The 2013 update to that study showed stronger results for the charter sector compared to the TPS (Cremata, Dickey, Lawyer, Negassi, Raymond, and

Woodworth, 2013). An examination of growth trends for brick-and-mortar charter schools in the 2013 study showed a pattern of slow but gradual improvement over the past several years. Taking into consideration the newness of the online sector, it is possible such a pattern might appear here as well given sufficient time.

### Results by State

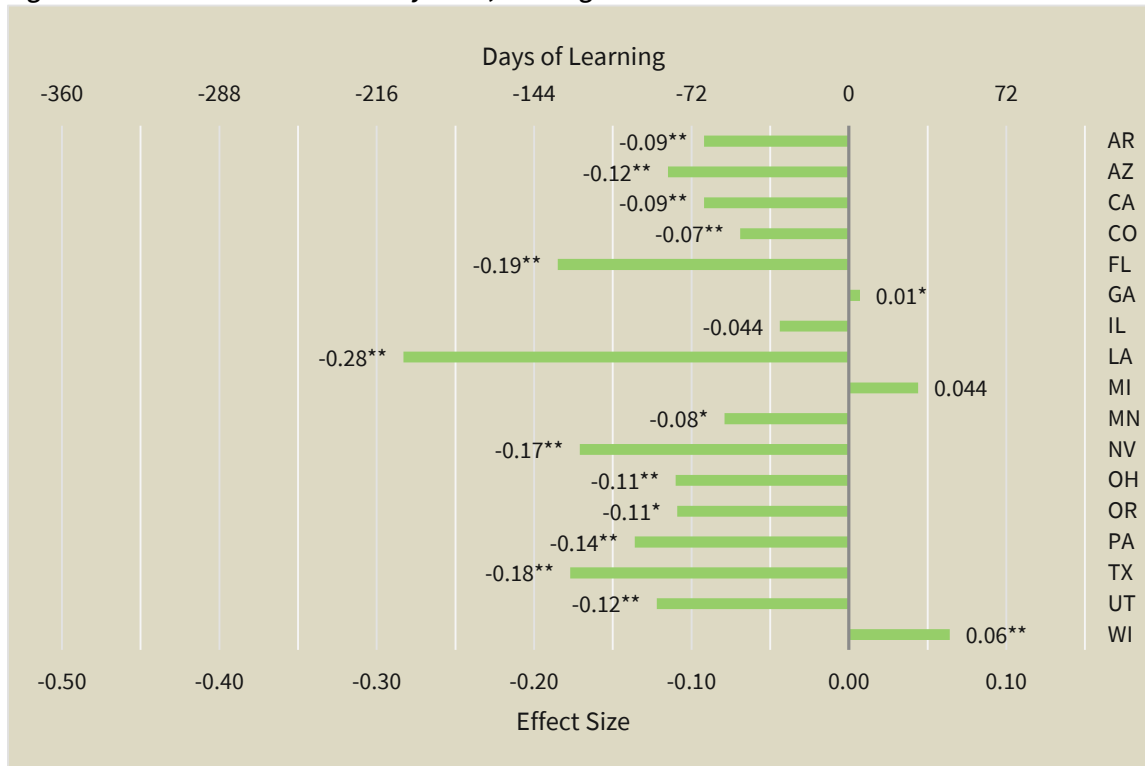
To delve deeper, we also included analyses of online charter attendance by state. In the full-data general case analysis, we use statistical methods to control for differences between states. In the online charter by state analyses, we examine the impact of online charter attendance by each state as compared to the state's average student academic growth. In Figure 5 and Figure 6 the zero line is the average **growth** of a VCR student in the state. A positive effect size means the average online charter student had stronger growth than the average comparison. A negative effect size means growth for online charter students was weaker than the average VCR comparison student.

While the majority of states have negative effect sizes for students attending online charter schools, there are a few exceptional states with no difference or even positive effect sizes between online charter students and TPS students. Figure 5 shows the impact for online charter students in reading. Thirteen states have negative effect sizes in reading, two states positive, and in two states the differences were not significant<sup>12</sup>. As was indicated by the general results, the average reading effect size is negative; however in Wisconsin and Georgia, online charter students have growth which was significantly stronger than their VCRs. While the value for Michigan is positive and larger than that of Georgia, the Michigan value is not significant. This means we cannot be certain the result is not spurious or due to chance; thus it is described as "not different".

---

<sup>12</sup> DC was not included in these analyses due to insufficient number of schools.

Figure 5: Online Charter Effect Size by State, Reading



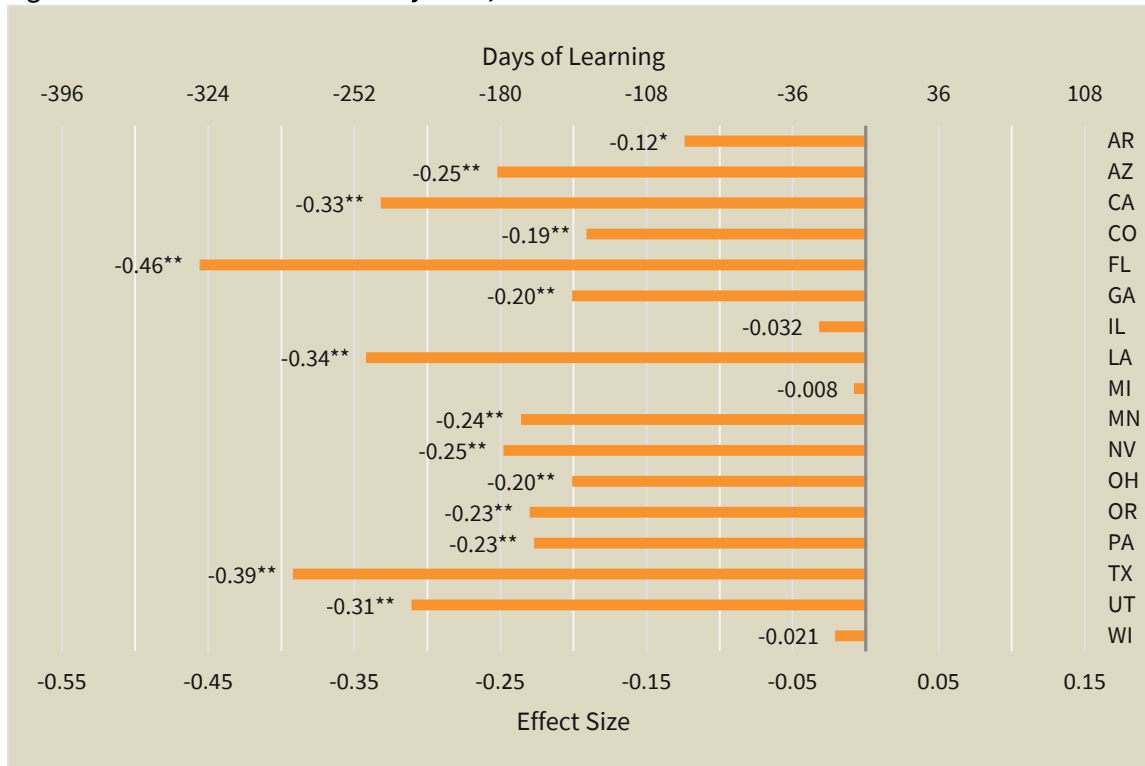
The 0.00 line for this graph represents the average TPS VCR, White, non-poverty, non-ELL, non-SPED student.

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

The effect sizes by state in math are shown in Figure 6. The effect sizes for math were both more negative and larger than those for reading. In 14 states, the impacts on math growth of attending an online charter school were significantly weaker than the comparison group. Three states had effect sizes which were not different from the comparison groups. No state had a positive effect size in math on average.

The math and reading results show there is a large amount of variation in the effectiveness of online charter schools in promoting academic growth in students attending those schools. The reasons behind this variation is a topic for future study. Practices in those states who are producing positive results may hold useful lessons for the remaining states.

Figure 6: Online Charter Effect Size by State, Math



The 0.00 line for this graph represents the average TPS VCR, White, non-poverty, non-ELL, non-SPED student.

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

### Sub-populations

#### Race-ethnicity

Exploring deeper into the performance question of schools requires us to examine the various sub-populations served by schools. In past studies of charter schools (Cremata, et al., 2013), CREDO has found evidence that students of different racial-ethnic backgrounds have different impacts on academic growth from attending charter schools. It has become standard practice to report academic growth by racial-ethnic groups. In the past, part of the motivation for the separate look at each student subgroup stems from the explicit mission of some charter school operators to serve communities whose students have historically fared poorly in school.

The student populations that online charter operators serve was shown in Table 2 to have greater proportions of White students and smaller shares of Hispanic and English Language Learner students.

While there is variation in the effect sizes of racial-ethnic groups, they are still all consistently negative.<sup>13</sup> Table 12 has the effect sizes in math and reading equal to the difference in performance between TPS students and online charter students for each of the racial-ethnic groups. Results were consistently less negative for reading than for math across all groups. Additionally, reading effect sizes are much more consistent between groups ranging from -0.08 (56 days) to -0.12 (86 days). White students in online charters have larger differences in growth relative to their TPS peers than all other groups except Native Americans in reading, but better than all sub-populations except Black students in math.

**Table 12: Effect Size of Attending Online Charter School by Racial-Ethnic Group, Reading and Math**

Racial-Ethnic Subpopulation	Reading	Days of Learning	Math	Days of Learning
White	-0.11**	-79	-0.25**	-180
Black	-0.08**	-58	-0.22**	-158
Hispanic	-0.11**	-79	-0.29**	-209
Asian/Pacific Islander	-0.09**	-65	-0.26**	-187
Native American	-0.12**	-86	-0.30**	-216
Multi-Racial	-0.09**	-65	-0.26**	-187

The effects in this table represent the difference between a student of a specific race in TPS and a student of the same race in an online charter school.

\*\* Denotes significant at the .01 level.

### Students in Poverty

Race-ethnicity is not the only student characteristic which commonly has an impact on students' academic growth. Students in poverty, those who are English language learners, and special education students also often have academic growth which differs from the typical comparison student.

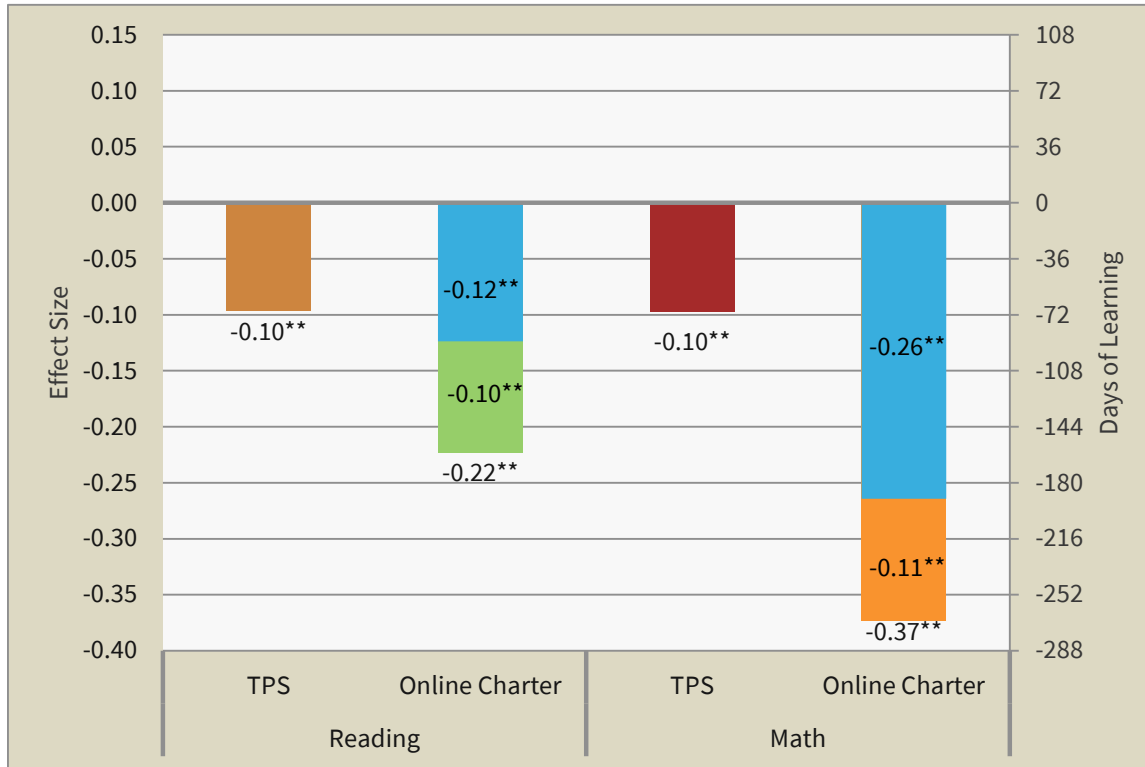
The average growth for students in poverty is generally lower than that for students who are not in poverty. In this analysis, the baseline comparison is TPS students who are not in poverty. We isolate the relationship between poverty and growth. This leaves a picture of the difference in the impact of online charter attendance on students in poverty compared to similar students who are not in poverty. The bars for online charter schools in Figure 7 consist of two different colors. The blue portion of the bar represents the average impact of attending an online charter school which effects all online charter students. The remainder of the bar represents the average difference between being an online charter student in poverty and an online charter student not in poverty. The total length of the bar is the average expected impact on growth of being an online charter student in poverty compared to being a TPS student who is not in poverty. Figure 7 confirms that being a student in poverty results in lower academic growth in both math and reading for all student groups regardless of the type of school attended with the online charter

<sup>13</sup> The survey of online charter providers also showed that they did not target any particular student demographically, but rather sought students with particular academic profiles. Thus a breakout of performance by the ordinary categories may not be as pertinent in an online environment as elsewhere.



student having the more negative overall effect. Figures 8 and 9 are read in the same manner with the blue portion of the bar representing the negative effect which all charter students face.

**Figure 7: Overall Academic Growth for Students in Poverty Compared to Students Not in Poverty, Reading and Math**



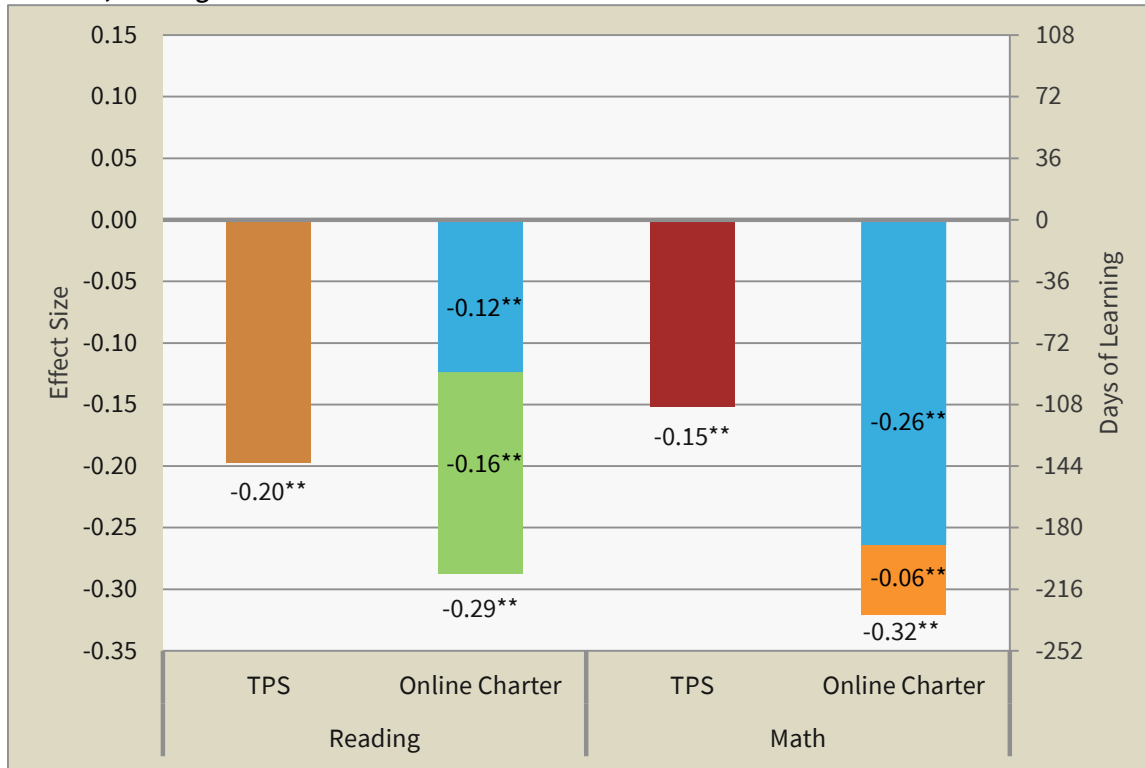
The 0.00 line for this graph represents the average non-poverty TPS student.

\*\* Denotes significant at the .01 level.

### English language learners

As with students in poverty, students who are English language learners tend to progress academically more slowly than students whose primary language is English. This is potentially even more of an issue in an online setting where students typically rely more heavily on reading as the primary method of curriculum delivery. Again, the data show that English-language learners in the data set have weaker growth as a group than non-English language learners. Figure 8 shows the growth for English language learners as compared TPS native English speakers.

**Figure 8: Overall Academic Growth for English Language Learners Compared to Non-English Language Learners, Reading and Math**



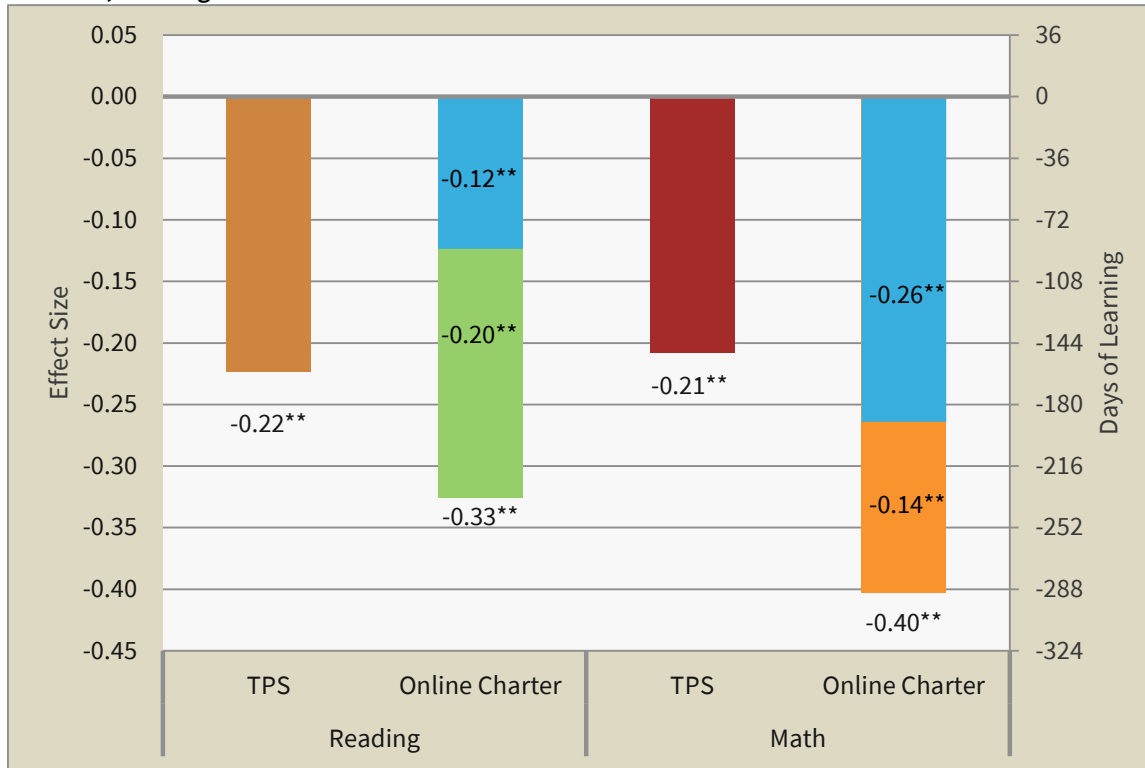
The 0.00 line for this graph represents the average TPS non-ELL student.

\*\* Denotes significant at the .01 level.

### Special education students

Another sub-population with significant impacts from online charter attendance is special education students. Again, special education students as a whole demonstrate weaker academic growth than their non-special education classmates as seen by the comparison of overall academic growth of special education students regardless of race/ethnicity or school type attended to non-special education student VCRs (see Figure 9).

**Figure 9: Overall Academic Growth for Special Education Students Compared to Non-Special Education Students, Reading and Math**



The 0.00 line for this graph represents the average TPS non-SPED student.

\*\* Denotes significant at the .01 level.

Online charter schools again demonstrate an ability to reduce the impacts of being a SPED student compared to non-SPED students. Math academic growth for students in online charters is significantly less negative compared to their non-SPED schoolmates, represented by the orange portion of the online charter bar, than that of the SPED VCRs and their classmates, the red bar. However, the full effect of being a special education student in an online charter school is still more negative overall than being a special education student in a TPS.

**Interpretation of Subpopulation Effects**

To help the reader to better understand the marginal differences in effect sizes included in the subpopulation analyses, we have included the two figures below. Figures 10 and 11 show the expected value of the effect size<sup>14</sup> for student profiles with certain combinations of characteristics. The column on the left shows the expected value of the effect size for each student profile in a traditional public school setting. The column on the right shows the expected values for the same student profiles if the student

<sup>14</sup> Effect sizes in Figures 10 and 11 represent growth of each profile relative to White non-ELL non-poverty non-SPED students.

attended an online charter school. The higher a profile is positioned up the vertical axis, the stronger the expected growth for a student with that profile. The number after the profile is the expected effect size for that profile.

The student profiles include a profile for each racial-ethnic group students who are not ELL, not SPED, and not in poverty. There are additional profiles are for each racial-ethnic group with one of the three additional factors (ELL, SPED, in poverty) included. Student profiles which do not specifically state they include ELL or SPED or in poverty do not have those features. We did not produce profiles for every possible combination of race-ethnicity and the three factors as doing so would have made the figures unreadable. However, as the effect sizes for ELL, SPED, and being in poverty are additive, any profile which includes a combination of ELL, SPED, and/or poverty would appear lower on the vertical axis than the profiles shown with only one factor.

Figures 10 and 11 demonstrate how the findings from the subpopulation analyses impact expected student growth. All student profiles regardless of race-ethnicity or other factors have weaker growth in online charter schools than in TPS. This is due to the overwhelming negative impact on student growth from attending an online charter school.

ELL students and SPED students of a given race-ethnicity have weaker expected growth than students of the same race-ethnicity who are not ELL or SPED; however, as shown in Figures 8 and 9, online charter schools are more successful in minimizing these negative impacts relative to their sector average in math. This is most apparent in Figure 11 when comparing the performance differences between Asian non-ELL non-poverty non-SPED students with Asian ELL students between the two sectors. The distance between the dots representing the Asian non-ELL non-poverty non-SPED and Asian-ELL students on the TPS line is much larger than the same distance on the online charter line.

Figure 10: Expected Values of Effect Sizes by Student Profile, Reading

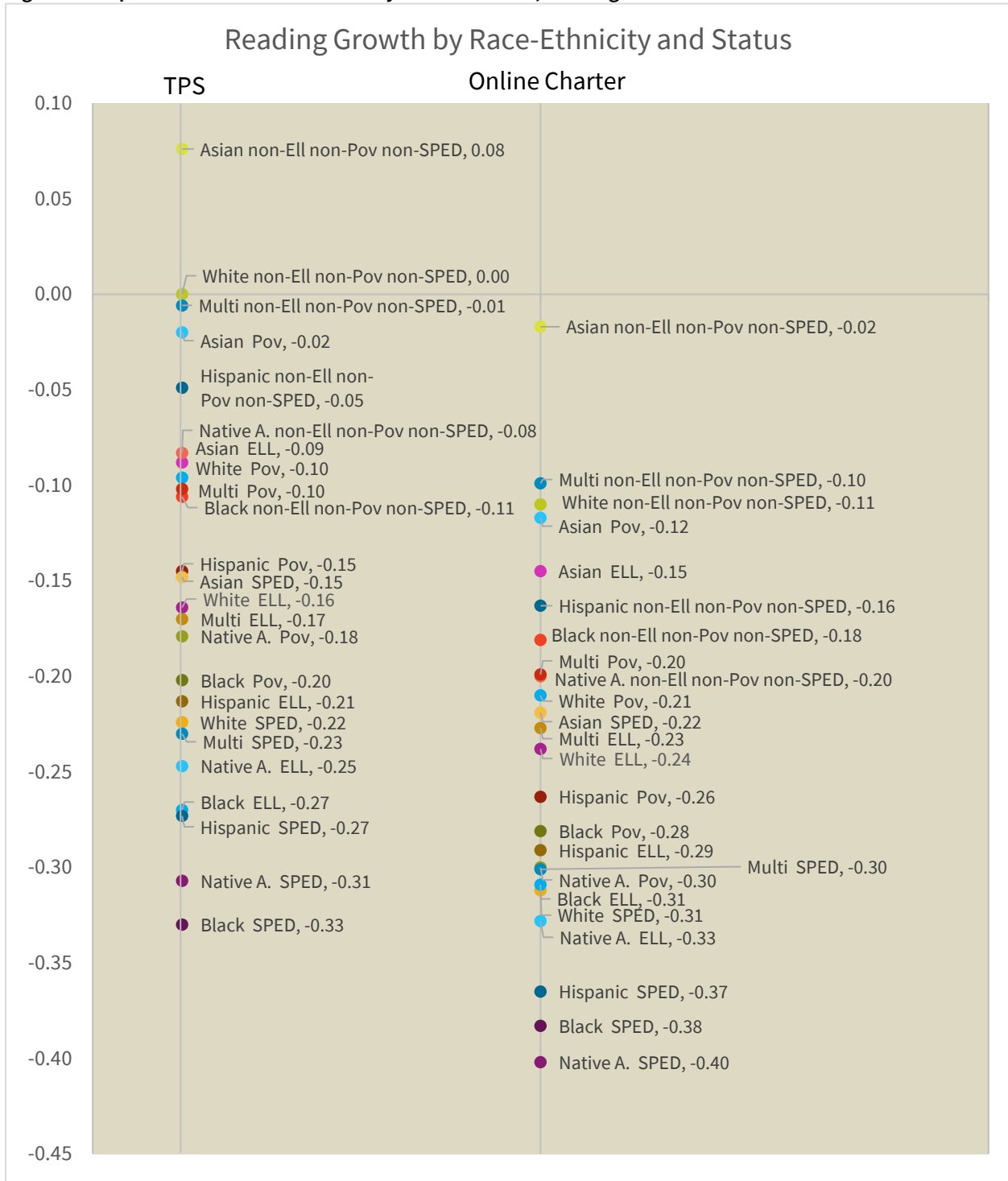
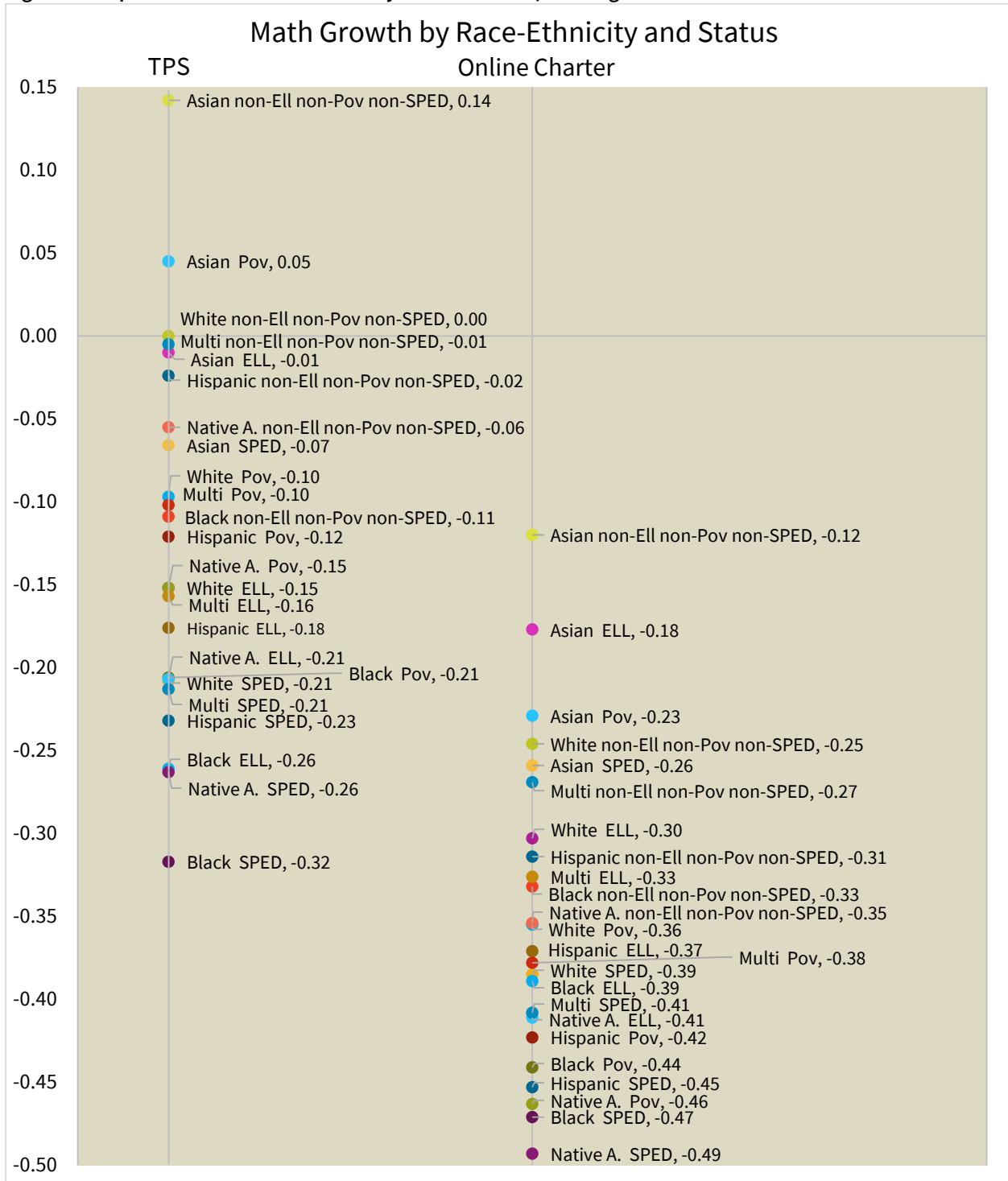


Figure 11: Expected Values of Effect Sizes by Student Profile, Reading



### Online Charter Schools Compared to Brick-District Schools

In its 2009 charter school study, CREDO introduced the idea of the school quality curve. The quality curve uses a statistical model to compare each charter school to a virtual school consisting of the VCRs for students from each charter school. This is a strong comparison as it allows the reader to see how individual online charter schools compare to a school of their peers. These measures use a smaller growth period data window made of the last two growth periods as opposed to the four growth period data window of the student analyses.<sup>15</sup> To minimize the statistical inconsistencies which may arise from including schools with only a few students, we limit this analysis to only schools with at least 30 tested students per year.

The quality curve consists of three categories, those schools with average growth statistically significantly lower than that of their feeders, those with average growth which is not statistically different from their feeders, and those schools with average growth statistically significantly stronger than their feeders. These three categories are distinct. The placing of a school into each category has different meaning as to the performance of the school. As such, readers should resist the urge to combine categories from this analysis. Specifically, it is improper and can be misleading to state “x% of schools performed stronger or no different than their local market” just as it is improper to combine the weaker and no different schools. These numbers should always be reported as three separate categories.

Compared to their comparison schools, online charter schools generally have significantly weaker academic growth. Figure 12 shows the quality curve in reading. As there are 101 schools in the quality curve, the numbers represent both the number and percentage of schools in each category. Only two percent of the online charter schools outperform their comparison schools, 32 percent perform no differently, and 67 percent have weaker growth than their comparison schools. In math, a full 88 percent of online charter schools had significantly weaker growth than their comparison. These numbers are extremely weak compared to charter school performance found in previous CREDO studies.

While these numbers clearly show students attending online charter schools are not performing at the level of their comparisons, it is important to note the incredibly large size of the individual school feeder pools may have consequences on the strength of the aggregated VCR matches. With the elimination of the restraints of physical location, online schools pull students from a much broader portion of the state than do standard schools of choice. This increases the number of schools in the comparison group and weakens the comparability between each online charter school and its feeders compared to CREDO’s other studies. Online charter schools tend to serve a much higher percentage of white students than TPS. Previous studies have consistently shown white students have smaller effect sizes from charter attendance than minority students. Also, online charter students have higher mobility rates than the

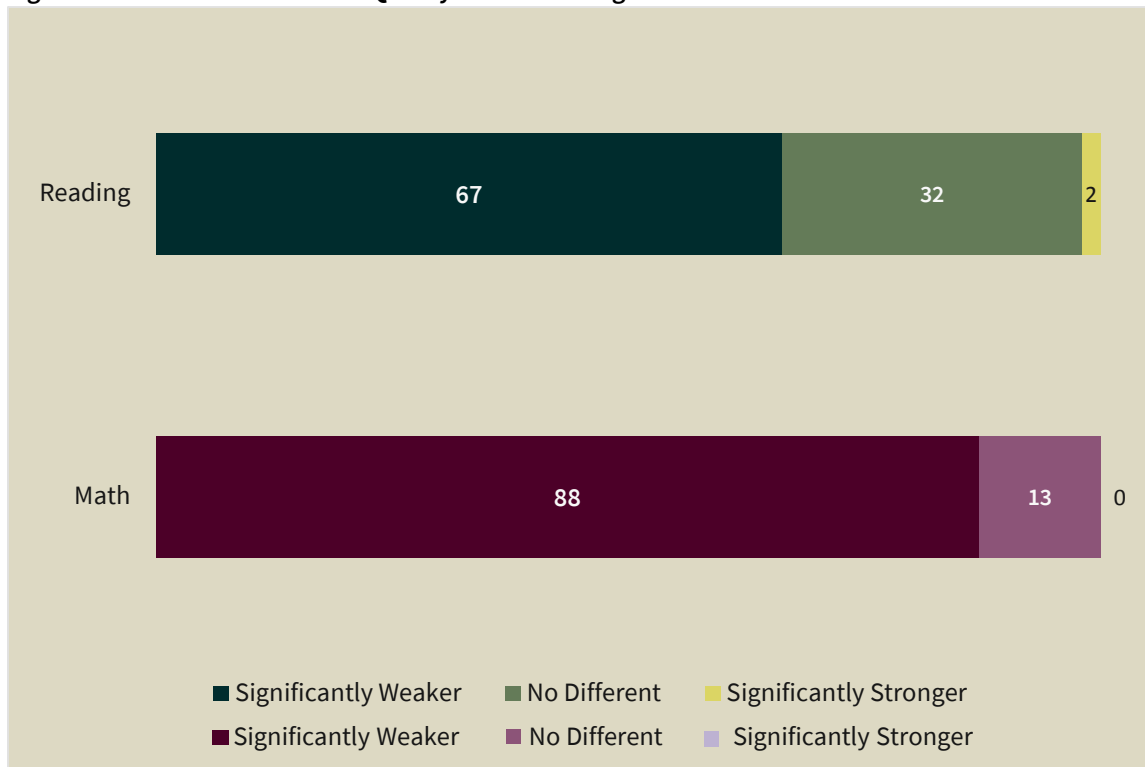
---

<sup>15</sup> The shorter period is necessary as the online charter sector in some states, as well as many individual online schools, are expanding at an exponential rate and comparisons from the earlier years may not reflect the current state of performance for the smaller samples which make up individual schools.

students who make up their VCRs. School instability has long been demonstrated to have a negative impact on student growth (South, Haynie, and Bose, 2007).

Due to the large number of feeder schools from which online charter schools attract their students, the TPS comparison groups for the quality curve consists of a much larger proportion of the schools in the state than the typical charter school. As a consequence, the bar for online schools in this comparison was high. In reading, even though only two online charter schools outperformed their comparison schools 18 of the online charter schools had achievement higher than their state’s average achievement. Eleven of the 32 schools with growth not significantly different from their comparison schools had achievement above their state’s average achievement, and six schools with weaker growth than their comparison school had achievement above the state mean. In math, none of the online charter schools had average achievement scores higher than their state average.

**Figure 12: Online Charter School Quality Curve: Reading and Math**



Even with these caveats firmly in mind, the percent of online charter schools whose students have weaker growth than their comparison is concerning. The qualifying argument of some online school providers is many of their students would have otherwise dropped out of school entirely. Thus any educational gains no matter how small are of benefit to the students and society. This argument may be justified when applied to high schools students, of which online charter schools have a higher percentage, but does not take into account the outcomes for elementary and middle schools students enrolling in online schools.



### Network Affiliation

Being part of a larger network of schools may allow online charter schools to take advantage of economies-of-scale in purchasing supplies and equipment. But more importantly online charter schools in a network may be able to leverage human capital gains across multiple schools.

The overall results for online charter schools in a network do not show a significant difference in effect sizes for schools which are part of a larger network as compared to independent online charter schools. The results show no statistically significant difference for academic progress in either subject. This is not to say, however, that all networks of charter schools perform the same.

Charter schools in the same network often share resources such as curricula, operational practices, and personnel training programs. If the schools within a network consistently produce common outcomes which are significantly above or below those of independent online charters and other schools in other networks, it is reasonable to presume the schools in that network are doing something different from the other schools. The statistical models used already account for differences in the starting academic endowments of students. Further, due to the wide geographic range of online charter schools, the results are likely not due to locale. This points to network resources such as work processes, teacher recruiting/training/retention, or other shared resources as the source of the network's higher or lower performance. To investigate this, CREDO applies a statistical model which isolates the impact on student growth of affiliation with each network.

Table 13 shows that even the students who attended the highest performing online network schools had academic growth which was weaker or not significantly different when compared to VCRs attending school in TPS settings. A value of 0.00 in Table 14 would be equal to the performance of the average brick-and-mortar TPS.

**Table 13: Effect Sizes by Network Compared to Average VCR, Reading and Math**

	Reading	Days of Learning	Math	Days of Learning
Network 1	0.07	48	-0.17**	-124
Network 2	-0.02	-12	0.03	21
Network 3	-0.02	-15	-0.19**	-134
Network 4	-0.05**	-39	-0.16**	-114
Network 5	-0.07**	-48	-0.05**	-32
Network 6	-0.07**	-48	-0.21**	-152
Network 7	-0.09*	-66	-0.16**	-116
Network 8	-0.12**	-83	-0.27**	-191
Network 9	-0.12*	-84	-0.21**	-150
Network 10	-0.14**	-98	-0.28**	-202
Network 11	-0.15**	-105	-0.28*	-199
Network 12	-0.15**	-107	-0.20**	-147
Network 13	-0.15**	-109	-0.27**	-193
Network 14	-0.16**	-114	-0.25**	-177
Network 15	-0.17**	-121	-0.30**	-218
Network 16	-0.18**	-126	-0.18**	-130
Network 17	-0.18**	-130	-0.33**	-235
Network 18	-0.22**	-156	-0.36**	-260
Network 19	-0.26**	-188	-0.49**	-353
Network 20	-0.28**	-204	-0.50**	-360
Network 21	-0.35**	-250	-0.38**	-274

The 0.00 value for this table represents the average TPS, White, non-poverty, non-ELL, non-SPED student.

\*\* Denotes significant at the .01 level.

Table 13 shows the impact of attending an online charter school as compared to TPS schools, but it is also interesting to see how networks perform within the online charter sector. Table 14 provides the results of this analysis using the same data as Table 13 re-centered on the average non-network online charter student. Table 14 shows a marked variation in the average performance of online charter schools by network as compared to the average independent online charter school. A value of 0.00 in Table 14 would be equal to the performance of the average independent online charter school.

**Table 14: Effect Sizes by Network Compared to Independent Online Charter Schools, Reading and Math**

	Reading	Days of Learning	Math	Days of Learning
Network 1	0.16**	115	0.06	43
Network 2	0.08**	58	0.26**	187
Network 3	0.08**	58	0.05	36
Network 4	0.04**	29	0.08**	58
Network 5	0.03	22	0.19**	137
Network 6	0.03	22	0.02	14
Network 7	0.00	0	0.07	50
Network 8	-0.02	-14	-0.03	-22
Network 9	-0.02	-14	0.02	14
Network 10	-0.04	-29	-0.05**	-36
Network 11	-0.05*	-36	-0.04	-29
Network 12	-0.05**	-36	0.03	22
Network 13	-0.06	-43	-0.04	-29
Network 14	-0.06**	-43	-0.01	-7
Network 15	-0.07**	-50	-0.07**	-50
Network 16	-0.08**	-58	0.05**	36
Network 17	-0.09**	-65	-0.10**	-72
Network 18	-0.12**	-86	-0.13**	-94
Network 19	-0.17**	-122	-0.26**	-187
Network 20	-0.19**	-137	-0.27**	-194
Network 21	-0.25**	-180	-0.15**	-108

The 0.00 value for this table represents the average Online Charter, White, non-poverty, non-ELL, non-SPED student.

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

**Online Charter Students Compared to Brick-Charter Students**

It is possible the differences in performance between online charter students and brick-district students is due to the charter nature of the online charter schools rather than the online nature. To address this concern, we created an additional matched data set in which we matched online charter students to brick-charter students using the same algorithm we typically use to match charter students to TPS (i.e. matched online charter students to demographically identical students in brick-and-mortar schools from which the online charter students transferred). We then repeated all the analyses using this brick-charter as VCR set (see Appendix B for full results). The summary in Table 15 shows the results between the two samples were highly similar. There were no major differences between the two sets of analyses. These results confirm that the findings presented above are a result of the online aspect of the schools as opposed to the charter aspect.

**Table 15: Summary of Significant Online Charter Impacts by VCR Group**

	Reading		Math	
	TPS VCR	Brick-Charter VCR	TPS VCR	Brick-Charter VCR
Overall	Negative	Negative	Negative	Negative
White	Negative	Negative	Negative	Negative
Black	Negative	Negative	Negative	Negative
Hispanic	Negative	Negative	Negative	Negative
Asian	Negative	Negative	Negative	Negative
Native American	Negative	Similar	Negative	Negative

### Mixed-Methods Analyses

The quantitative analysis of online charter impact results provides insight into how growth differs from a TPS student for those students who attend an online charter school. However, that information is the starting point to the larger question of why does attending an online school impact the students’ growth. To delve deeper into the mechanisms behind the answer to the question of why, we can combine data on student achievement with information about the schools which students attend. We do this by estimating correlations between the presence (and in some cases dosage) of practices included in the survey and student achievement for students who attended online charter schools.<sup>16</sup>

While these models may provide some insight into the relationships between school practices and student achievement, they are not causal, that is to say we cannot prove the presence of a particular school policy creates the impact seen in the quantitative analysis. Such correlational examinations are interesting in that they point towards areas for additional research using causal models as well as provide information for future policy trials by online charter providers. It should also be noted the sample size of schools with both survey data and impact data was small (n=60) which limits the generalizability of these results.

### Student Testing Data and School Survey Data

For the student-level comparisons, we were able to use statistical models which controlled for differences in race-ethnicity, gender, SPED, ELL, and poverty status of students to estimate effect sizes for several factors. Factors in the survey group naturally into clusters: curriculum, instructional practices, parent/student expectations, communications, student supports, etc. Results for the different clusters of questions are presented below. Again, while these results provide information about the relationship between online charter school characteristics/practices and student academic growth, they should not be considered causal.

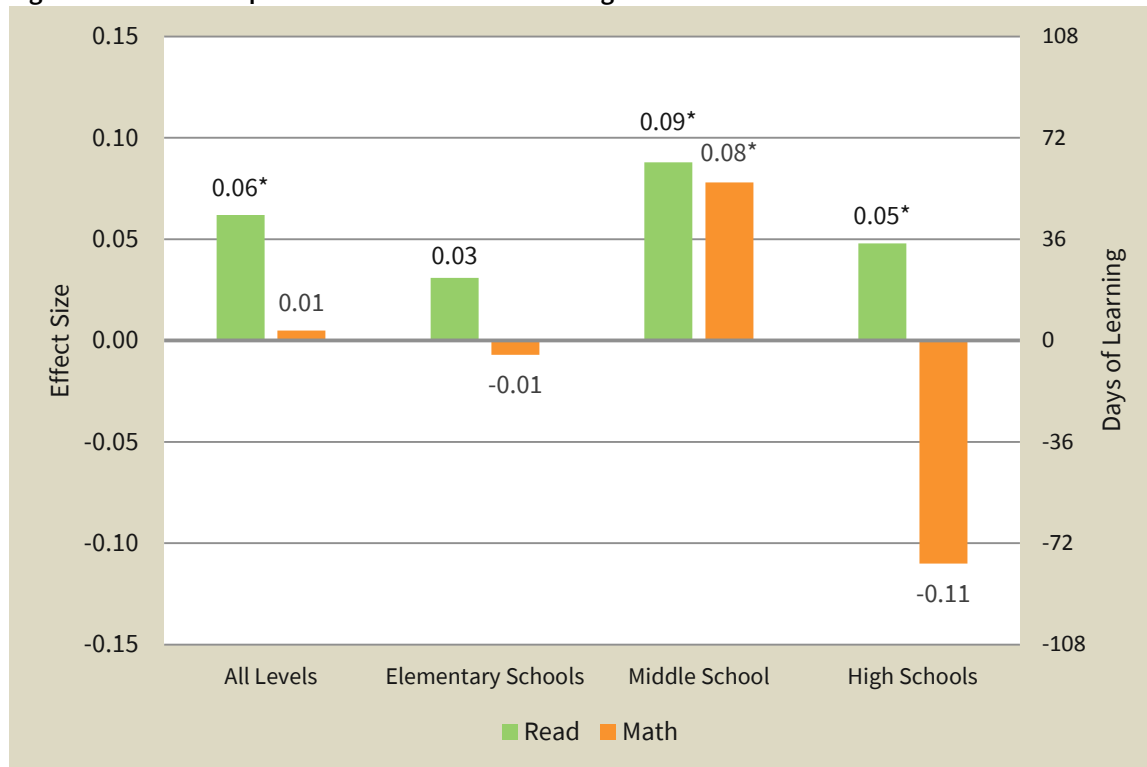
<sup>16</sup> As the survey was not administered to TPS school leaders, these correlations relate to online charter schools only. This means a positive or negative correlation represents growth which is stronger or weaker than the online charter average growth.

**Self-Paced Delivery**

A major characteristic of online education is the ability for curricula to be consumed in a self-paced manner. While some brick-and-mortar schools have broken away from the standard model by using a lesson structure in which students work through self-paced lessons, usually via technological delivery, most still use the typical single class lessons.

The survey administered by Mathematica asked online charter schools if they offered courses that are entirely self-paced. Seventy-seven percent of schools state they offer some entirely self-paced courses. CREDO’s analysis of student academic growth finds students attending schools offering self-paced courses have academic growth in math which is not significantly different from schools not offering self-paced courses, but stronger growth in reading. However, it is reasonable to propose the ability to work independently in a self-paced course is a function of age. Younger students likely require more academic support than older students, thus the impact of participating in self-paced courses may differ by school level. Figure 13 shows the effect size of attending an online charter school which permits some level of self-paced courses by school level.

**Figure 13: Relationship between Growth and Attending an Online Charter School with Self-Paced Classes**



The 0.00 line for this graph represents the average online charter, White, non-poverty, non-ELL, non-SPED student.

\* Denotes significant at the .05 level.

Attending a school which allows self-paced courses has a significant positive relationship in reading for schools of all levels combined compared to online charter schools which do not allow self-paced courses. Breaking the effect out by school level shows the relationship is positive and significant for middle school and high school students, but not significantly different for elementary students. The relationship in math, however, was very different. The overall relationship for students in math was not significantly different from zero, and only for middle school students was access to self-paced math classes a positive benefit on academic growth. While the effect size in math for high school students was large, it was not significant. This means the effect could be due to chance even with its large size.

The survey results also contain information about the dosage of self-paced coursework. The question asks what percentage of a school's coursework is entirely self-paced. The responses ranged from five percent to 100 percent of coursework being self-paced with the most common answer being 100 percent. The statistical models show increasing the percentage of self-paced work has a negative relationship on academic growth in both reading and math. At first, this may not seem logical, especially in reading where having access to self-paced courses has a significant positive effect size. But, the apparent inconsistency can be explained by the concept that just because a proper dose of something is good, it doesn't mean a larger dose is better.

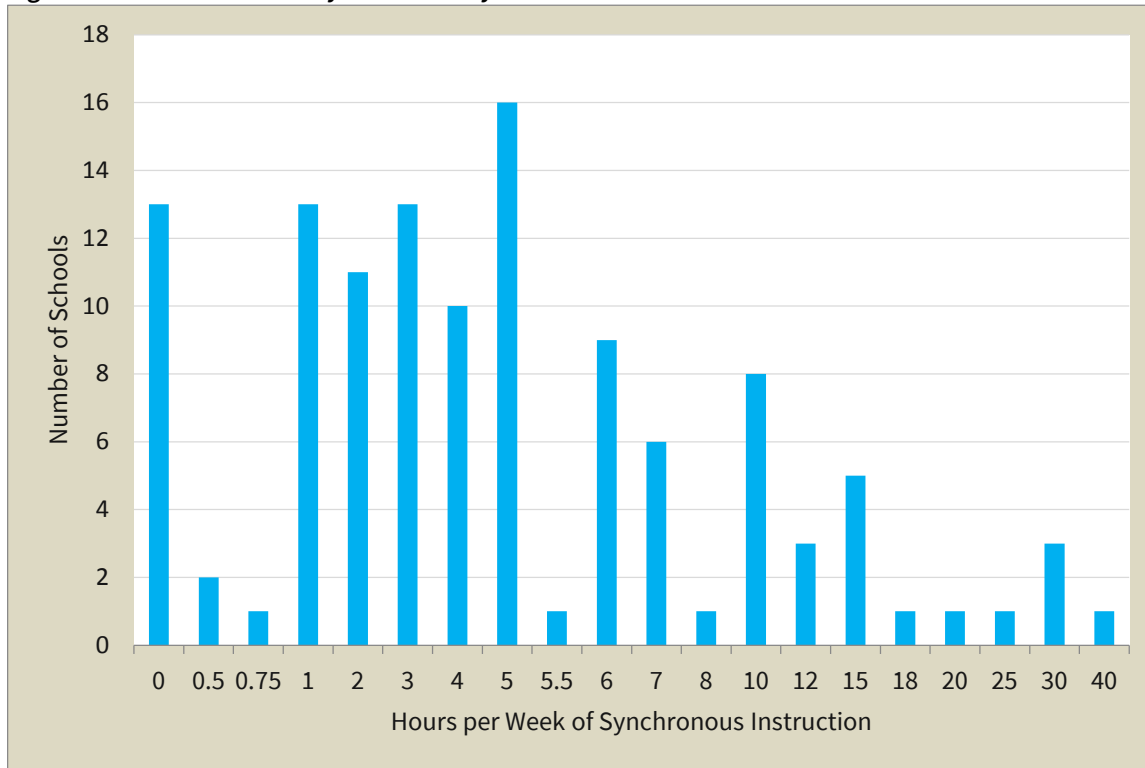
#### Synchronous vs. Asynchronous

Another element of curricula delivery is whether students complete work at the same time as a group or on their own schedule. Synchronous delivery is typically described as all students receiving instruction at the same time. Synchronous instruction is exemplified by the historical model in which the teacher teaches a lesson to the entire class all at once. Online schools can adopt various levels of synchrony in their curricula deliveries. Some schools may function exactly like the traditional brick-and-mortar school. They may require all students to log in at specific times to receive instruction with the only difference from a traditional brick-and-mortar school being that the students are in different physical locations.

Some online schools fully embrace the asynchronous model by allowing students to complete educational requirements whenever they wish. In fully asynchronous schools, students can meet their educational commitments at odd hours which better fit around the students' other activities, such as work or training. Even the number of days or number of hours a student must devote to educational experiences can be flexible in a fully asynchronous setting.

The Mathematica survey also addressed the hours of instruction which was synchronous by school level. The statistical models do not show any significant relationships in either reading or math at any school level based on the hours of instruction which was synchronous. As with self-paced instruction, schools varied greatly on the amount of time they spent in synchronous instruction. Figure 14 contains the number of online charter schools from the survey and the number of hours students in each school spend in synchronous instruction.

**Figure 14: Count of Schools by Number of Synchronous Hours of Instruction**



**Class Size**

The Mathematica survey includes information at each school level, elementary, middle, and high, on the average course size in the online school in both reading and math. The class size for ranged from one student per class to 180 students per class. Table 16 has the average class size and maximum class size by school-level. The impact of class size was significant and positive for middle school and high school students in both reading and math. While the effect size was very small, only .001, this is the impact per additional student.

**Table 16: Reported Average and Maximum Class Size by School Level**

	Average Class Size	Maximum Class Size
Elementary School	39	70
Middle School	60	150
High School	71	180

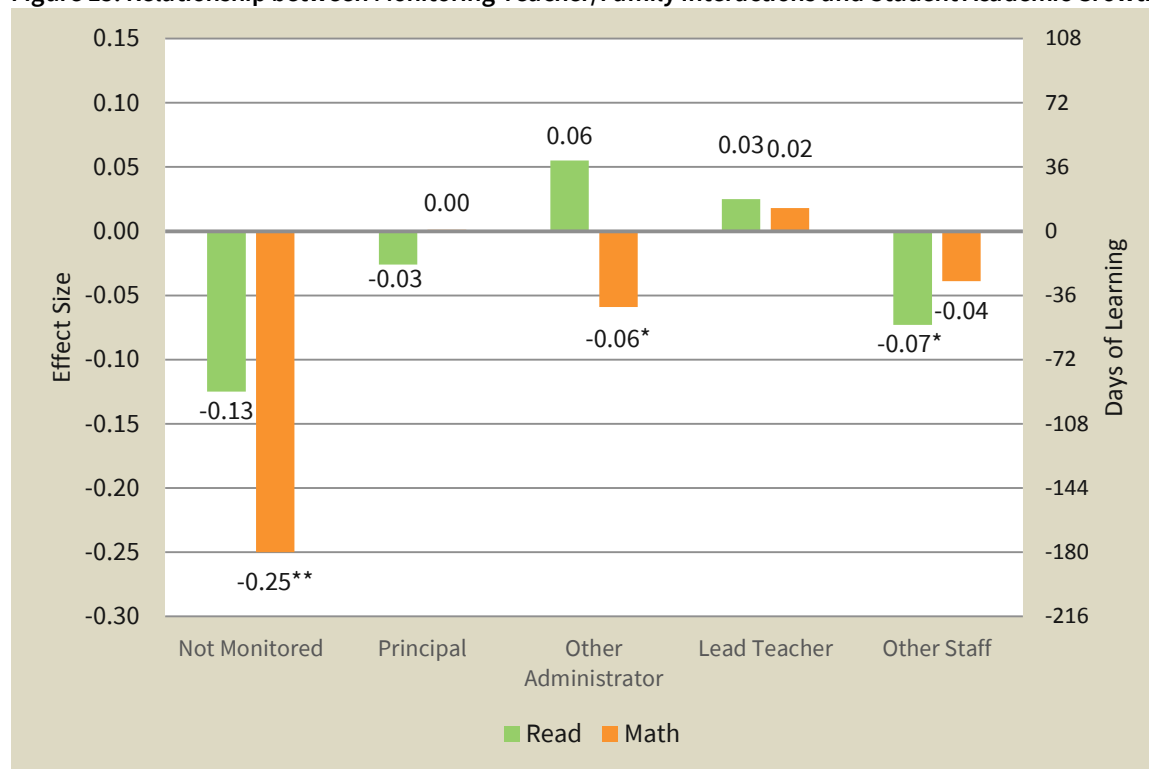
**School and Family Interactions**

One of the more interesting sets of questions included in the survey was an inquiry into the relationship between the school and the family receiving services. This line of questioning is of interest because schools employ a wide variety of policies. As the online student and their family may be located some

distance from the school’s center of operations, it is possible no one in the family has ever had an in-person interaction with the teachers or a school administrator. Even if the family has visited the school operations center, it is still possible the teacher works out of a third location remote to the student and the operations center. These remote practices are different from the standard education model whereby teachers interact with students on a daily basis and provide parents with regular conference opportunities. Departures by some online schools from the traditional educational model also include a shifting of the responsibility for supervising educational progress and participation from the teacher to the parents.

The Mathematica survey includes a question about who monitors the interactions between the online teachers and students/parents. The options were: contact is not formally monitored, principal, other school administrator, lead mentor/teacher, other staff not listed. School leaders completing the survey were allowed to choose all answers which applied to their school. Results from the statistical models are very revealing about the need for someone to monitor these interactions. Figure 15 includes the relationships between student scores and attending a school which uses each policy.

**Figure 15: Relationship between Monitoring Teacher/Family Interactions and Student Academic Growth**



The 0.00 line for this graph represents the average online charter, White, non-poverty, non-ELL, non-SPED student.

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.



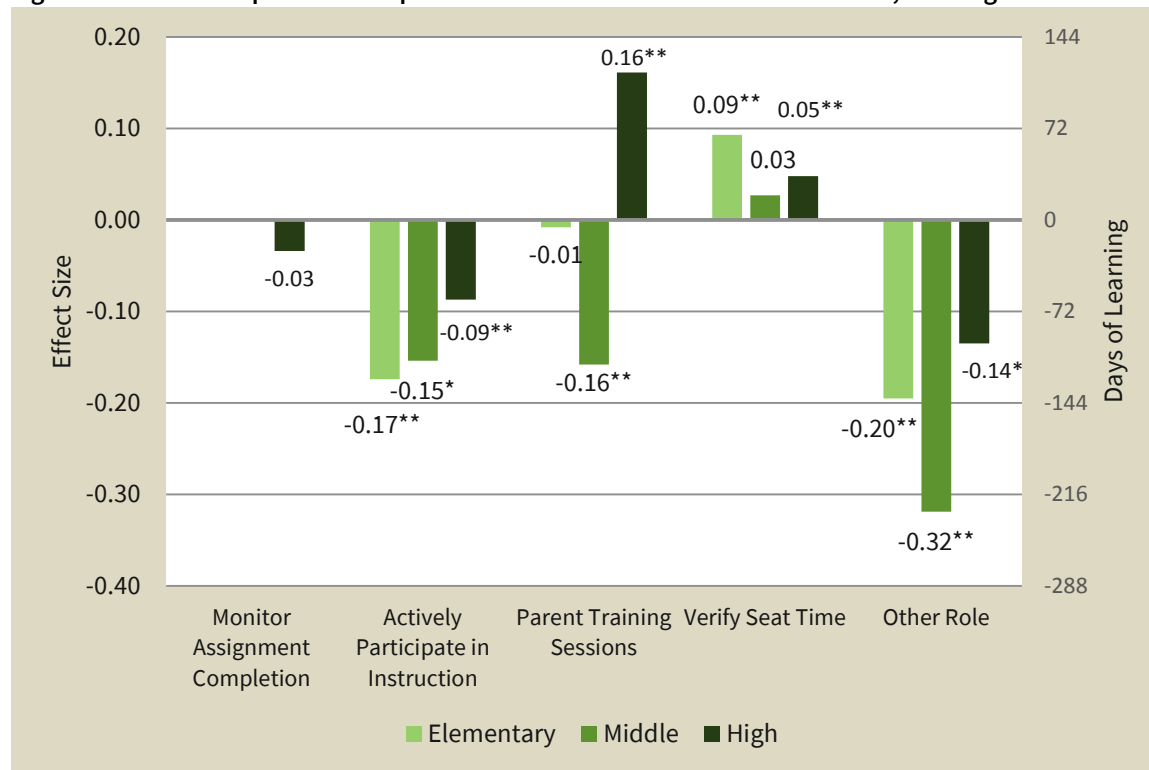
Not formally monitoring the interactions between teachers and families of online charter students is correlated with a large significant negative impact on math academic growth. The results were also negative in math when the supervision is delegated to a school administrator other than the principal. In reading the only significant result occurs for schools where the interaction is monitored by a non-administrator, non-teacher staff member. What is clear from these results is communication between the school and the family matters for online students, and the existence of that relationship needs to be monitored by someone other than just the assigned teacher to ensure the communication occurs.

Part of the reason communication between the schools and the families of online charter students is important may lie in the roles the online school expects parents to fill in their child's educational experience. Expectations for the role of the parent differ across online schools. In the survey, the principals are asked to select from a list of roles the school expects the parent to fill. It is worth noting the principal's affirmative response does not mean the parents are adequately fulfilling these roles, only that the school has an expectation the parents will provide these supports. This is a useful distinction when interpreting how student outcomes vary with these expectations.

The role of the parent is likely to change with the age of the student; accordingly, this survey item is asked in relation to specific school-levels: elementary, middle school, and high school. Building principals were asked to select all the roles which apply to their school. Some schools selected all possible responses while others reported only some or none. Some replies are ubiquitous across all the schools of a level which means a relationship between that reply and student academic growth cannot be estimated. For example, all elementary and middle school principals replied that they expect parents to monitor completion of assignments, this means we cannot estimate how strongly parental review of assignment completion matters for student performance.

The strength of the relationships between the online charter school reporting expected parental roles and academic growth in reading and math are given in Figures 16 and 17 respectively. The only parental roles which have a consistent positive relationship to student academic growth are the expectation of parents verifying seat time. In high school math, most of the parental roles were significant; however, this was primarily due to the fact that high schools which expected parents to actively participate in instruction and attend parent training sessions all also expected parents to monitor assignment completion. This means those two factors get a boost from the effect of monitoring assignment completion. Parents actively participating in instruction and filling other roles both have a consistently negative relationship with academic growth for all groups except high school math. While the statistical models in these analyses are not causal, the strong patterns we are seeing suggest the issue may be that schools are holding expectations for parents which the parents do not meet. It would be hard to explain otherwise why a school expecting parents to actively participate in instruction would have a negative relationship with growth if parents were adequately meeting the expectation.

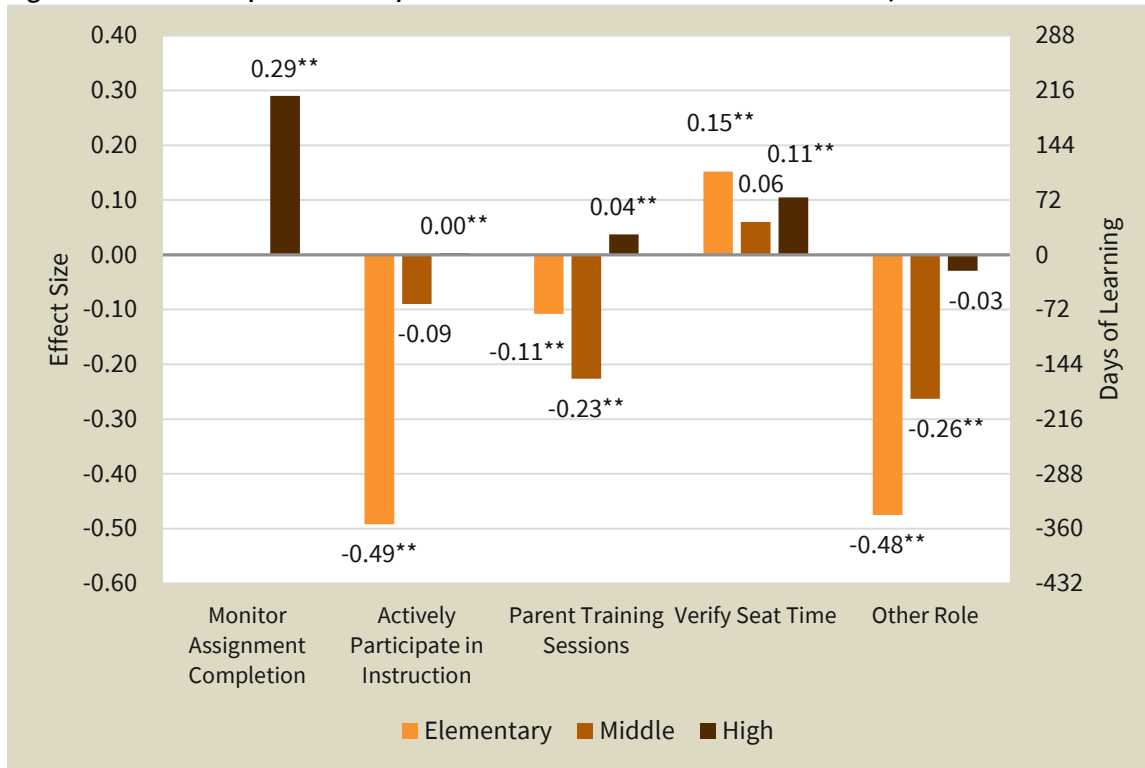
Figure 16: Relationship between Expected Parental Roles and Academic Growth, Reading



The 0.00 line for this graph represents the average online charter, White, non-poverty, non-ELL, non-SPED student.

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

Figure 17: Relationship between Expected Parental Roles and Academic Growth, Math



The 0.00 line for this graph represents the average online charter, White, non-poverty, non-ELL, non-SPED student.

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

### Methods of Class Communication

Other items on the survey sought information on methods used by online schools to interact with students during instruction. There are questions which focused separately on asynchronous instruction and synchronous instruction.

For asynchronous instruction, the respondents are asked to identify all the methods used in their school to engage students in asynchronous learning. Possible survey responses were

- Email
- access to physical textbooks
- interactive online exercises
- using other websites with instructional focus or content
- recordings of lectures
- discussion forums or threaded discussion groups
- social media
- other tools not listed above

Of all the options, only two have significant relationships with academic growth. In reading, having access to recordings of lectures has a positive 0.10 standard deviation (72 days) effect size in relation to reading growth in schools which do not have access. In math, having access to physical (paper) textbooks has 0.09 (65 days) positive relationship with math growth compared to schools which do not.

Practices for synchronous instruction are also included in the survey. Because of the “real time” nature of synchronous instruction, these practices are more centered on live communications methods. Table 17 lists the various communication methods and their relationship with academic growth in reading and math.<sup>17</sup> In both reading and math, using audio conferencing in synchronous instruction has a positive relationship with academic growth. Providing instruction through online chat forums has a strong negative relationship with math growth. Likewise, instant messaging does not appear to be an effective means of communicating “real time” reading instruction to students.

**Table 17: Tools Used to Support Synchronous Instruction, Reading and Math**

	Reading	Math
Video Conferencing	-0.01	0.07
Screen Sharing	0.19	0.18
Audio Conferencing	0.13*	0.29**
Online Chat Forum	-0.19	-0.54**
Instant Messaging	-0.13**	0.00
Phone Calls	-0.03	-0.17
Text Messaging	0.10	0.05
Other	0.00	0.21**

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

Another question asks principals if their school provides technological support to students. Options include schools providing an internet connection, a computer, computer accessories, or assistive technology for students with disabilities. Of these options, none has a significant relationship with academic growth in either reading or math with the exception of assistive technology in math has a strong (-0.10) significant relationship with academic growth. This relationship emphasizes why we do not make causal claims in this portion of the study. It is difficult to imagine a situation where providing disabled students with assistive technology would cause the student to experience weaker academic growth. What is more likely is that students with disabilities so severe they require special adaptive equipment may not be fully compensated for in the statistical models which control for the average effect of students being in special education.

<sup>17</sup> It is noteworthy that very little impact was identified for these tools in general. Many methods show moderate to strong relationships which are not significant. This may be due to the small number of replies in that category. Having a small number of replies means the statistical models cannot differentiate between truly strong relationships and those which falsely appear strong by chance.

### School-Level Data and School Survey Data

CREDO used the student-level data from the impact analysis above to produce school-level fixed effects measures of academic progress which were then merged with the school principal survey. Combining school-level data with the survey data provides a slightly different lens through which to view the outcomes. The student-level comparisons provide a wider view of the relationship between the various survey topics and academic growth, but the results can be heavily influenced by the largest schools which will have many more individual student records. By looking at how the survey factors relate to school-level effect sizes, the weight of the relationships is distributed more evenly between the larger and smaller schools.

Because many of the survey questions ask if a school uses a particular practice or does not use that practice, it is possible to use a t-test to estimate the average relationship of that practice to the school's effect size on student growth. This provides additional information beyond that derived from just using a correlation as it provides the reader with additional information on the relative size of the impacts of different educational practices.

Many of the survey questions were grouped around related concepts such as parental roles, factors relating to principal experience and compensation, and factors related to school operational policies. The correlations between these questions and the school-level effect sizes have been grouped by general category below. It is worth noting that the survey data was collected from across the nation and values were weighted for non-response. The data included in the correlations below represents a subset of the survey data as the below data was limited to only those responses which also had school-level coefficient estimates. The use of a restricted survey data set in this section means the aggregated numbers presented here will likely be different from those presented in the descriptive volume of the report. For purposes of any national discussion, the reader should refer to the values from the descriptive volume.

The complete set of correlations between school-level effect sizes and survey responses is provided in Appendix C of this report. The reader should keep in mind that by chance, 5 percent of the correlations will be significant in each subject. To this end, the table in Appendix C includes all of the correlations and their p-values to allow for better interpretation of the significance of the relationship between each condition and the school-level effects.

### School-Wide Policies

Students enrolled in online charter schools, especially asynchronous schools, may experience a variety of expectations on their individual participation. The presence or absence of clear-cut policies for student participation could be expected to have a strong relationship with academic growth. The Mathematica survey includes three items relating to student participation. Principals were asked if their school has a school-wide policy spelling out expectations for students in the completion of assignments, class participation, and attendance in synchronous portions of instruction. Only one school in the correlational data did not have school-wide requirements for completion of assignments. Having clearly defined rules for class participation has a positive relationship with academic growth in reading, but the effect was not

significant in math. However, there was a negative correlation in math between school effect sizes and schools reporting they monitored student participation by the pace at which students completed course assignments.

**Table 18: School-Wide Policies, Reading and Math**

	Reading		Math	
	Correlation	Effect Size	Correlation	Effect Size
Class Participation	.37*	0.14*	.25	0.13
Attendance in Synchronous Instruction	.24	0.06	.02	0.01
Monitors Pace of Student Completion of Assignments	-.27	-0.13	-.38*	-0.29*

\* Denotes significant at the .05 level.

Due to the use of asynchronous instruction in online charter schools, the awarding of course credits based on seat time may not be an appropriate metric. Another means of awarding course credits to students is through the assessment of course content mastery. Schools were asked if students could earn course credits through demonstration of mastery in none, some, or all courses. Table 19 shows a negative correlation exists between holding the policy of allowing mastery based credits in some subjects and school-level effect size in both reading and math.

Table 19 also includes results for correlations between school-level effects and the frequency with which schools assessed students. There was no significant correlation between the frequency of assessment of students and student academic growth in math. There was a moderate correlation in reading between more frequent assessments and academic growth for elementary and middle school students. Frequency of assessment was not correlated with school-level effects for high school students.

**Table 19: Course Credits and Assessment Frequency, Reading and Math**

	Reading		Math	
	Correlation	Effect Size	Correlation	Effect Size
Seat Time Credits Only	.12	0.03	-.03	-0.01
Mastery Based Credits in Some Courses	-.35*	-0.09*	-.33*	-0.12*
Mastery Based Credits in All Courses	.04	0.01	.04	0.02
School Participates in Title I	-.36*	-0.08	.03	0.01
Frequency of Assessment Elementary Grades	.49*	n/a	.16	n/a
Frequency of Assessment Middle School Grades	.42*	n/a	.11	n/a
Frequency of Assessment High School Grades	.05	n/a	-.10	n/a

\* Denotes significant at the .05 level.

Another set of school-wide policies included in the survey revolved around school funding. The principals were asked if the school received funding based on course completions as opposed to course enrollments, if schools received target funds for providing special education services, and if the school participated in the federal Title I program. Of these factors, only participation in Title I had a significant relationship and only in reading.

One major set of policy decisions which are usually set at the school-wide level is curriculum and instructional practices. The survey included a variety of questions related to the development of curriculum and methods for delivering the curriculum. In reading, receiving curriculum from the management company was associated with positive school effect sizes. Correspondingly, reporting in-house developed curriculum and teachers of record being responsible for developing curriculum was negatively correlated with school effect sizes in reading. None of these policies had significant correlations in math.

Method of delivery for the school's curriculum is another important factor which can impact student academic growth. Among the various delivery methods included in the survey, only one the frequent use of teacher-guided synchronous instruction in 7<sup>th</sup> grade reading was significantly correlated with school-level effect sizes. The correlation was not significant in math. A more specific breakout of synchronous instruction looked at the number of hours spent in synchronous instruction for each school-level. Most of these correlations were not significant except more hours of synchronous instruction in math was significant and positive for 4<sup>th</sup> grade students.

**Table 20: School-Wide Policies Relating to Curriculum and Instruction, Reading and Math**

	Reading		Math	
	Correlation	Effect Size	Correlation	Effect Size
Some Curriculum Provided by Management Company	.53*	0.17*	.22	0.10
Majority of Curriculum Developed In-House by Individual Course Instructors	-.27*	-0.12*	-.04	-0.02
Teacher of Record Responsible for Developing Curriculum	-.55*	-0.13*	-.24	-0.08
Increased Frequency of Teacher-Guided Synchronous Discussion 4 <sup>th</sup> Grade	.33	n/a	.25	n/a
Increased Frequency of Teacher-Guided Synchronous Discussion 7 <sup>th</sup> Grade	.41*	n/a	.10	n/a
Increased Frequency of Teacher-Guided Synchronous Discussion High School	.16	n/a	.07	n/a
Time in Synchronous Instruction 4 <sup>th</sup> Grade	.10	n/a	.37*	n/a
Time in Synchronous Instruction 7 <sup>th</sup> Grade	-.02	n/a	.10	n/a
Time in Synchronous Instruction High School	-.25	n/a	.01	n/a

\* Denotes significant at the .05 level.

### Student Support Activities

One issue in which online charter schools may differ substantially from the typical brick-and-mortar school is in student support activities of the school. The survey included several questions about various student support activities taken on by the school. These included activities common to all schools such as one-on-one interventions, providing guidance counselors, assessing student needs. Online charter schools also have some unique support activities such as tech support for students or provision of internet services.

The first step to providing services to students is assessing what services each child needs. The survey included a question about actions taken by online charter schools to assess student needs when a new student enrolls in the school. Table 21 shows the relationship between many possible types of entry assessments and school effect sizes. Of the steps listed, only assessments of parental or other home supports and the students' learning disabilities have a significant relationship with the school effect size.



**Table 21: Entry Assessment for New Enrollees**

	Reading		Math	
	Correlation	Effect Size	Correlation	Effect Size
Academic Skills	.05	0.02	.01	0.01
English-Language Skills	.27	0.07	.30	0.11
Potential Barriers for Online Learning	.20	0.05	.12	0.04
Parental or Other Home Supports	.27	0.06	.33*	0.10*
Student Learning Disabilities	.11	0.02	.34*	0.10*
Other Disabilities	.11	0.02	.12	0.03
Pull Records from Previous School	-	-	-	-
Phone Call to Household	.17	0.07	-.02	-0.01
Home Visit	-.23	-0.06	-.04	-0.01

\* Denotes significant at the .05 level.

One-on-one interventions are practices taken by a school when a teacher, administrator, or parent has concerns that a student requires additional services to achieve academic success. When teachers and students are not physically present in the same location, intervention may look different from the standard classroom. Some online schools have tutors whose sole job is to provide interventions. Other schools expect the teacher to work directly with the students outside of the regular class time. Of course, even online schools are still required to provide special education supports required by the student’s individual education plan (IEP). A series of questions about who provides the one-on-one support show some significant relationships between the provider and student academic growth.

Table 22 shows the relationship between various providers and school-level fixed-effects estimates of academic growth for elementary students. Providing proper special education support for elementary students in online charter schools is correlated with positive academic growth. Further, the use of non-teacher tutors does not seem to provide the same level of academic growth as receiving one-on-one support from the class teacher in reading. The relationship in math is not significant.

The results for middle school and high school students were similar to those for elementary students with regards to the use of tutors and coaches. Unfortunately, the number of schools in the upper grade levels who do not have teacher-provided and special education faculty-provided one-on-one support was too small to compute a value for these relationships at the middle school or high school levels.

Additionally, the amount of time a student spend in one-on-one instruction was not significantly correlated with student achievement for students at any level.

**Table 22: Providers of One-on-One Support to Students, Reading and Math**

Provider	Reading		Math	
	Correlation	Effect Size	Correlation	Effect Size
<b>ELEMENTARY</b>				
Teacher	.25	0.08	.03	0.01
Tutor/Coach	-.45*	-0.09*	.11	0.03
Special Education Faculty	.53*	0.10*	.41*	0.10*
<b>MIDDLE SCHOOL</b>				
Tutor/Coach	-.45*	-0.09*	.20	0.05
<b>HIGH SCHOOL</b>				
Tutor/Coach	-.52*	-0.11*	.003	0.001

\* Denotes significant at the .05 level.

The survey also contained a variety of questions about other support services provided to students. Most of these programs did not have a significant relationship with the school effect size. Table 23 includes the other support programs which did have a significant relationship with school-level estimates of student growth. The presence in a school of a program for talented and gifted students being associated with stronger growth seems logical. The negative relationships between academic growth and programs to support students who are parents may seem counterintuitive as we would expect those programs to help those students rather than hinder them. However, the fact that students in some schools are dealing with being a parent at a young age while students in other schools may not face that challenge, thus the school does not provide such a program, may explain the negative correlation. Likewise, it is hard to imagine that in-person tech support harms a student’s academic growth. Rather, students from families which have such a low level of computer literacy that they require outside support to set up their computer likely have other challenges which are the actual cause of the negative correlations.

Finally, an increase in the number of guidance counselors serving an online school was correlated with significant positive growth in reading and a non-significant correlation in math.

**Table 23: School-Provided Supports**

	Reading		Math	
	Correlation	Effect Size	Correlation	Effect Size
Talented and Gifted Program	.41*	0.09*	.27	0.08
Programs for Students Who Have Children	-.09	-0.02	-.31*	-0.10*
In-Person Set Up of Computer	-.39*	-0.09*	-.23	-0.08
Guidance Counselors	.39*	n/a	-.01	n/a

\* Denotes significant at the .05 level.

**School and Family Interactions**

In the student-level analysis, several elements of school and family interactions had significant relationships with student achievement. This still holds true in the school-level analysis although the relationships are not all the same. The differences are related to the weighting of the student values which result from looking at the relationships using average school effect sizes instead of individual student values.

For the student-level data, schools in which parents were expected to be actively involved in their child’s instruction have a negative relationship with growth. In the school-level analysis, we again see a negative relationship between schools’ expectation that parents will actively participate in the student’s instruction and academic growth (see Table 24). For the remainder of parental roles, the results were either not significantly related or could not be measured due to the small sample size and a lack of variation in responses.

**Table 24: Relationship between Expected Parental Roles and Academic Growth, Reading and Math**

Provider	Reading		Math	
	Correlation	Effect Size	Correlation	Effect Size
<b>ELEMENTARY</b>				
Actively Participate in Instruction	-.42*	-0.08*	.29	0.07
Parent Training Session	.06	0.02	.03	0.01
Verify Seat Time	.02	0.00	.21	0.05
<b>MIDDLE SCHOOL</b>				
Actively Participate in Instruction	-.27	-0.06	.24	0.07
Parent Training Session	-.03	-0.01	-.22	-0.08
Verify Seat Time	-.10	-0.02	.14	0.04
<b>HIGH SCHOOL</b>				
Actively Participate in Instruction	-.21	-0.05	.24	0.08
Parent Training Session	.01	0.00	-.10	-0.03
Verify Seat Time	-.05	-0.01	.08	0.02

\* Denotes significant at the .05 level.

**Professional Development and Compensation**

One of the processes by which schools support teacher improvement is through professional development opportunities. The survey inquired about the frequency and delivery format of professional development within online charter schools. The only format of professional development which had a significant correlation with student academic growth in either math or reading was online-delivered

profession development. There was a negative correlation (-.38) between the increasing frequency of online-delivered teacher professional development and student growth in math. The relationship in reading was not significant. The correlations between the frequency of in-person teacher professional development and student growth was not significant in math nor reading. Schools which report having teachers observed by master teachers or teaching coaches had significantly lower effect sizes in math than those who did not.

One practice which did have a significant positive relationship with school effect sizes was providing teachers with diagnostic test results at the individual student level for purposes of planning instruction. This correlation was .34 in reading, but not significant in math.

**Table 25: Teacher Professional Development Activities, Reading and Math**

	Reading Correlation	Math Correlation
Frequency of Online Professional Development	-.03	-.38*
Frequency Observed by and Received Feedback from Master Teacher	-.10	-.37*
Frequency Provided with Diagnostic Test Results for Individual Students	.34*	.04

\* Denotes significant at the .05 level.

Schools also have a variety of professional development for school leaders. Among those included on the survey, only site visits to other schools had a significant correlation with school-level effect size. In schools where school leaders reported visiting another school for the purpose of improving their own work as a school leader in the past 12 months, the correlation with school effect size was .35 in reading.

**Table 26: School Leader Professional Development Activities, Reading and Math**

	Reading		Math	
	Correlation	Effect Size	Correlation	Effect Size
University Coursework	-.04	-0.01	-.01	-0.00
Visits to Other Schools	.35*	0.08*	.20	0.06
Coaching by Leader of Another School	.16	0.04	-.01	-0.00
Participating in School Leader Network	.20	0.05	.28	0.11
Workshop Presenter	.17	0.04	.07	0.02
Workshop Participant	-.31	-0.10	-.11	-0.05

\* Denotes significant at the .05 level.

Teacher incentives are another policy area which varies from school to school. Charter schools have more flexibility in the methods used to compensate teachers than the traditional public schools. The questionnaire included a series of questions about factors that impact teacher salaries for the online charter school. The questions asked if a teacher would be paid more as a result of the factors listed in Table 27 below. Most of the options do not have a significant relationship with growth. The two exceptions were pay based on student growth and on the teacher holding an advanced degree. These two factors were significantly related to student growth in reading. Interestingly, while course completion as an influencing factor on teacher compensation was not significantly correlated with school-level effects, including student course completion was negatively correlated (-.45) with school-level effect size in math.

While not direct compensation per se, tenure can also be an important means of rewarding teachers. We found a significant positive correlation between teachers' ability to earn tenure and school effect sizes in reading but not in math.

**Table 27: Influencing Factors for Teacher Compensation, Reading and Math**

	Reading		Math	
	Correlation	Effect Size	Correlation	Effect Size
Teacher Evaluation	.29	0.06	.08	0.02
Student Growth	.41*	0.09*	.30	0.09
Student Proficiency	.08	0.02	.21	0.08
Course Completion Rates	.17	0.06	.26	0.12
Holds Advanced Degree	.39*	0.08*	.05	0.01
Years Experience	.12	0.03	.19	0.06
Multiple Certifications	.11	0.03	.25	0.10
Hard-to-Staff Position	.09	0.02	.13	0.04
Number of Students	-.20	-0.06	.03	0.01
Mentor to Other Teachers	-.10	-0.02	.08	0.03
Teachers Can Earn Tenure	.31*	0.11*	.13	0.06

\* Denotes significant at the .05 level.

A similar question relating to compensation for school leaders was also included in the survey (see Table 28). The only compensation factor which had a significant relationship with student achievement level was student proficiency level. The correlation between basing school leader salary on student achievement level was .45. This significant relationship was not present in reading.

**Table 28: Influencing Factors for School Leader Compensation, Reading and Math**

	Reading		Math	
	Correlation	Effect Size	Correlation	Effect Size
Number of Enrolled Students	-.07	-0.02	-.06	-0.02
Student Achievement Growth	.24	0.05	.22	0.07
Student Proficiency Level	.28	0.06	.45*	0.14*
Course Completion Rates	.05	0.01	.25	0.09
Reenrollment Rates	.18	0.04	.03	0.01
Retention of Teachers	-.31	-0.10	-.11	-0.05
School Profit	.23	0.05	-.17	-0.05

\* Denotes significant at the .05 level.

Throughout the various related concepts, we did not find factors which impacted both reading and math. Likewise, we did not find consistent groups of factors within a concept which had significant relationships with school effect sizes. The absence of clear sets of factors which have a relationship with school effect sizes was in itself an interesting finding. The school-level survey did not reveal clear group of mechanisms by which to influence school-level effect sizes.

School leaders have a wide variety of responsibilities in any school. While the school leader of an online charter school has many responsibilities in common with the leader of a brick-and-mortar school, the online school may demand a different balance of responsibilities and that rebalancing may result in different outcomes. While we do not have comparative data, school leaders were asked to report what percentage of their time they spent on a variety of activities. We computed the correlation between the percent of time spent on several activities and the school-level effect size on student academic growth. School leaders spending higher percentages of their time with students, including discipline and academic guidance, was correlated with higher school-level effects in reading. None of the other school leader activities was significantly correlated with school-level effect size.

**Table 29: Percent of School Leader Time by Task, Reading and Math**

	Reading	Math
	Correlation	Correlation
Internal Administrative Tasks	-.21	-.30
Observing Teachers	.09	.07
Working with Teacher Coaches or Other Instructional Leaders	.04	.13
Developing or Leading PD	-.21	-.01
Reviewing Student Achievement Data	.38*	.30
Student Interactions	-.12	.05
Parent Interactions	-.06	.28

\* Denotes significant at the .05 level.

### Non-Significant Findings

As part of the school-level analysis, we evaluated the relationships between the survey responses and each individual school’s estimated effect size in both math and reading. The majority of the relationships were not significant. Table 30 contains a partial list of survey response items found to have non-significant correlations with student academic growth. The full set of correlations is provided in Appendix C of this report.

**Table 30: Survey Items of Interest with Non-Significant Correlations with Math and Reading Effect Sizes**

Survey Item
School monitors synchronous seat time
Percentage of coursework which is self-paced
Average class size
School size

### Student Testing Data and Policy Changes

In our US Constitution, education is one policy domain that is relegated to state authority and control. The individual’s right to a free public education is guaranteed in each state’s state constitution. As such, every state has the duty to set the policies which govern the operation of schools within their state. This means education practices permissible in one state, may be banned in another. In fact, several states allow neither online schools nor charter schools at all.

In the second volume of this report, the Center on Reinventing Public Education (CRPE) conducted an analysis of state education policies as they relate to online charter schools (Pazhouh, Lake, and Miller 2015). They found that in those states which do allow online schools, policies governing online charter schools vary. Further, individual states can and do change their policies independently. This leads to a pattern of occasional policy shifts as some states change their policies but others do not; the overall pattern of policy shifts across all the states can be exploited for research purposes. We can use statistical models which allow us to examine the differences in student academic growth which correspond to the existence and changes in an individual state’s online school policies.

In their analysis, CRPE identified education policies which may have a relationship with the academic growth of online charter school students. CREDO then computed correlations between school-level effects and the presence of three of these policies. The three policies included were: authorizer oversight fees, the existence of for-profit online charter schools with state-wide enrollment policies in a state, and if a state had specialized oversight provisions specifically for online charter schools.

Authorizer oversight fees are fees charged to the charter schools by the organizations who authorize and have oversight authority over the charter schools. These fees are usually computed as a percentage of the per-pupil funding received by the charter school. As Pazhouh, Lake, and Miller state in their policy

review, “Fees from large online schools can come to represent a large proportion of agency operating revenues and may create a disincentive to regulate and close consistently low-performing online charter schools.” The second factor, for-profit and state-wide enrollment documents the presence of policies within the state which allow for BOTH the operation of for-profit charter schools and the ability of online charter schools to enroll students from any location within the state. Finally, some state laws include unique oversight and accountability provisions specific to online charter schools. Most of these provisions are partial measures, addressing authorizing entities and processes, special application requirements (i.e., technology plans), or accountability provisions regarding the frequency and manner of reporting.

Table 31 below shows a significant negative relationship between authorizers collecting oversight fees and student academic growth in math. Having online charter specific oversight policies and stronger charter laws in general have a significant and positive relationship with math academic growth. In reading, only the strength of the state’s charter law had a significant relationship with academic growth. These correlations fit the narrative provided by CRPE in the second volume of this report.

**Table 31: Correlations between Education Policies and School-Level Effects**

	Math	Reading
Authorizer Oversight Fees	-0.21*	-0.12
For-Profit and State-Wide Enrollment	0.19	-0.11
Specialized Oversight Policies	0.20*	-0.19
Strength of Charter Law	0.33*	0.25*
Strength of Charter Law Ranking	0.32*	0.06

\* Denotes significant at the .05 level.

During the data window of this study, there were four policy changes which were likely to impact online charter schools. As these changes occurred over time within a state, we used student-level data to estimate a yearly school effect and then compared those school effects before and after the specific policy change. Table 32 shows the average change in academic growth associated with the implementation of each policy. Table 32 also contains a list of topics included in the regulation change. Details on the policy changes are available in the Pazhouh, Lake, and Miller volume of this report. Due to the existence of multiple simultaneous policy changes, it is not possible to disentangle which aspect of each law holds the causal mechanism in relation to student achievement.



**Table 32: State-Level Policy Change Description**

	State	CO	MN	OH	OH
		HB-11-1277	SF-1528	HB-3660	HB-2301
	Effect Size	-0.07	-0.27**	0.16**	0.17*
Policy Topics Contained in Law					
Accountability		X	X		
Oversight/Governance		X		X	X
Authorizing		X	X		
Communication			X	X	X
Quality Review			X		
Funding				X	
Enrollment Processes/Caps				X	X
Teacher Licensure					X
Assessment					X
Equipment/Internet Access					X

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

The policy change in Colorado was not correlated with a significant change in academic growth. The policy change in Minnesota was associated with a large significant negative effect size. Both of the policy changes in OH were associated with stronger academic growth. The difficulty in making an analysis such as this is accounting for multiple policy changes in each law. For example, the list of changes associated with Ohio SB 2301 cover several policies. The positive relationship could be due to more student access brought about by the elimination of the enrollment cap and the requirement for districts to release up to three percent of students to attend online charter schools, or the positive impacts could also be the result of the requirements for teachers to have state-certification. The current data did not allow us to tease out these possibilities. Over more time, comparing multiple changes in multiple states could allow more refinement of which policies are having what impact. Unfortunately, we are limited by the number of changes which took place within the data window of our study.

### Summary and Implications

The purpose of this report was to present to online education stakeholders data-based information on the academic impact of attending online charter schools. The report combined student-level data, school-leader survey responses, and state policy data. Using academic data, we compared the growth of students attending online charter schools to that of students in TPS and students in brick-and-mortar charter schools. We also combined student-level data with information from a survey conducted by Mathematica Policy Research. This mixed methods analysis permitted us to examine the relationship

between a variety of online charter school policies and student academic growth. We also included information from the Center on Reinventing Public Education's review of state policies. As online charter schools are a seldom-studied area, this report represents one of the most in-depth examinations of the topic.

**Online charter students had weaker growth than their VCRs.** While results vary for each student, the data showed the majority of online charter student records had weaker academic growth in both math and reading compared to their VCRs. The pattern of weaker growth remained consistent across racial-ethnic subpopulations and students in poverty. Online charter schools were found to reduce the negative impacts on growth in math for students who were English language learners and special education students relative to their non-ELL and non-SPED peers compared to the size of the negative impacts for the ELL and SPED VCRs to the non-ELL and non-SPED VCRs.

**Pre-online mobility is the same for online charter students and their VCRs.** The study of student mobility showed students who eventually enroll in online charter schools have pre-online mobility rates similar to those of their VCR comparisons. However, after enrolling in online charter schools, these students tend to become more mobile changing schools at a rate 2 to 3 times higher than their peers. Twenty-two percent of online charter students eventually return to TPS sector with the average time in an online charter school being two years.

**Positive growth across a sector is possible.** Some online charter schools which were part of multi-school networks had average impacts on academic growth which were stronger than the typical online charter. Online charter schools in Wisconsin and Georgia had academic growth in reading which on average was stronger than their VCRs. These findings show it is possible for online charter schools to produce stronger growth, but it is not the common outcome.

**Few school-level practices had a strong relationship with academic growth.** A review of the relationship between school practices as reported in the Mathematica survey and student academic growth found mostly insignificant correlations between school practices and growth. Of practices in the survey which had strong positive correlations, attending schools which offered some self-paced classes was the most wide-spread and was found to be consistent across all school levels. The findings on the expected parental roles was also revealing in that placing more instructional responsibilities on parents was strongly correlated with weaker growth across most settings.

**Teasing out the impact of state-level policies is difficult.** The role of state-level policies matters in online charter education. The state-level policy changes included in the study did have significant relationships with the academic growth of online charter students. With the data included in this analysis, it was not possible to tease out which aspects of the particular policy changes led to the changes in academic growth. This is a critical area for future study.

**Being an online school matters more than being a charter school.** Finally, the major impacts of attending an online charter school appear to be primarily driven by the online aspect of the schools.

Analyses comparing online charter school students to brick-and-mortar charter students produced results which were nearly identical to the results derived from comparisons of online charter students and TPS students. If the charter aspect of online charter schools or an interaction between the charter and online aspects were the driving factors of online charter school growth, we would have expected to find different results between the brick-and-mortar charter analysis and the TPS analysis. We did not.

### Implications

Finding the best means to educate every student will require society to think beyond the bounds of traditional schools. Online schools are a relatively new and rapidly expanding method of providing an alternative to traditional schools. The findings presented in this report establish a starting point for discussing the future implications of attending online charter schools.

1. Current online charter schools may be a good fit for some students, but the evidence suggests that online charters don't serve very well the relatively atypical set of students that currently attend these schools, much less the general population. Academic benefits from online charter schools are currently the exception rather than the rule. Online charter schools provide a maximum of flexibility for students with schedules which do not fit the TPS setting. This can be a benefit or a liability as flexibility requires discipline and maturity to maintain high standards. Not all families may be equipped to provide the direction needed for online schooling. Online charter schools should ensure their programs are a good fit for their potential students' particular needs.

2. Current oversight policies in place may not be sufficient for online charter schools. There is evidence that some online charter schools have been able to produce consistent academic benefits for students, but most online charter schools have not. The charter bargain has been "Flexibility for Accountability" and all charter schools must be held to that concept. Authorizers must step up to their responsibilities and demand online charter providers improve outcomes for students. Authorizers should hold a firm line with those schools which cannot meet their end of the charter bargain.

3. States should examine the current progress of existing online programs before allowing expansion. Online schools have the potential to serve large numbers of students with practically no physical restraints on their expansion. As such, mechanisms which have typically played a role in regulating the growth of brick-and-mortar schools such as facility construction and limited potential student pools do not exert pressure on online schools. Without these natural constraints, online schools have the potential to expand more rapidly than traditional schools. This makes it critical for authorizers to ensure online charter schools demonstrate positive outcomes for students before being allowed to grow and that online charter schools grow at a pace which continues to lead to improved outcomes for their students.

## Appendix A: DESCRIPTIVE PROFILE OF ONLINE CHARTER STUDENTS

Table 33 shows the number of students from each state by year included in the study sample. This count represents tested students with at least two years of data who were enrolled fulltime in the identified, wholly online charter schools. As can be seen in Table 33, there was a wide variation in online charter enrollment across the states. Additionally, some states have stable enrollment patterns while others have rapidly increasing enrollment numbers. In some states, the online charter enrollment rate increased ten-fold over the course of three years. The rate at which online charter enrollment is increasing in some states provided emphasis on the need and timeliness of this study.

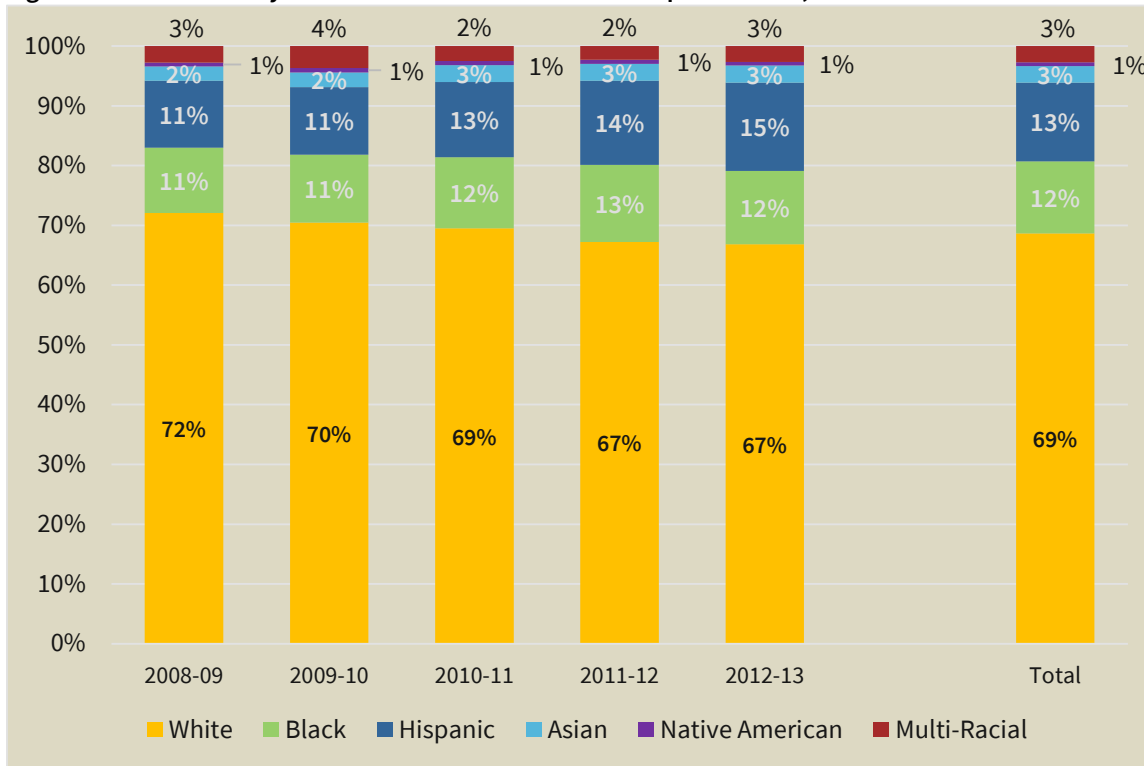
**Table 33: Number of Matched Online Charter Students by State and Year, Math**

State	2009-10	2010-11	2011-12	2012-13	Total
AR	232	236	235	228	1,166
AZ	3,201	3,240	4,166	4,303	17,118
CA	6,260	7,769	9,519	9,845	38,400
CO	1,456	2,935	3,961	4,043	14,920
DC	14	33	29	27	117
FL	6	6	25	68	107
GA	2,299	2,975	4,676	4,012	15,436
IL	337	389	439	493	1,658
IN	50	191	1,067	1,941	3,269
LA	0	0	467	927	1,394
MI	119	253	466	605	1,552
MN	395	455	477	292	1,905
NV	1,840	2,912	2,743	3,334	11,655
OH	5,309	6,245	6,012	6,582	27,772
OR	1,515	1,600	1,857	1,997	7,887
PA	6,784	7,704	9,011	9,935	39,540
TX	364	802	3,492	5,603	10,269
UT	488	903	1,108	967	3,596
WI	336	439	682	‡	1,466
Total	31,005	39,087	50,432	55,202	199,227

‡2012-13 data was not available for Wisconsin.

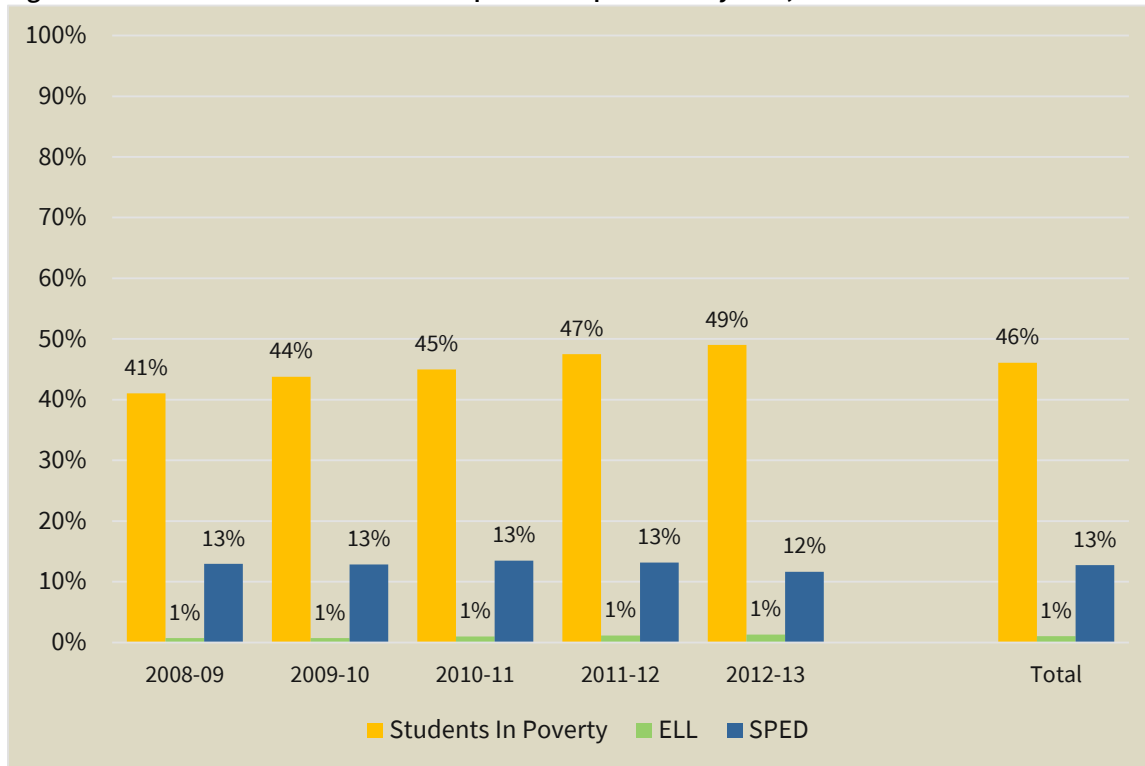
The demographics of the matched sample are similar to the rates shown in Table 2. Figure 18 shows the race-ethnicity of the students in the brick-district VCR matched sample. The matched sample was made up predominantly by White students. One-in-four students in the matched sample were Black or Hispanic with Asian, Native American, Multi-Racial students making up the remainder of the sample. While the online charter demographics differ from those of both brick-and-mortar district and charter schools, they are similar to the demographics of online schools operated by districts.

**Figure 18: Race-Ethnicity of Brick-District VCR Matched Sample Data Set, Math**



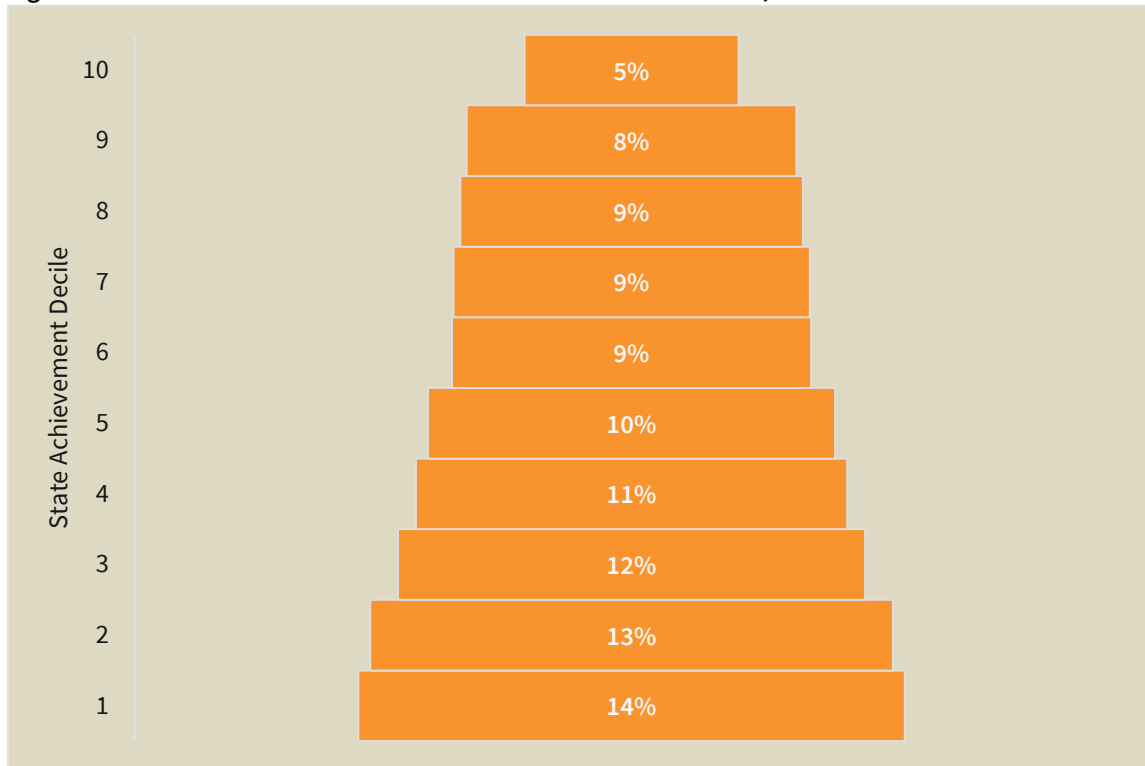
As shown in Table 2 in the main body of the report, the percentage of students in poverty attending online charter schools is lower than that of the feeder schools, but higher than the entire brick-district sector in the studied states. Based on Figure 19, the percentage of students in poverty enrolled in online charter schools has increased over the time of the study. The percentages of ELL students and special education students are steady across the years. As noted previously, the percentage of ELL students enrolled in online schools is much lower than in brick-and-mortar schools. This was true regardless of whether the online school was a district-run or a charter run school.

Figure 19: Brick-District VCR Matched Sample Sub-Populations by Year, Math



The students in online charter schools were more likely to come from the lower deciles of academic achievement than the TPS students. In Figure 20, the width of the block in the beehive graph represents the percentage of students from each decile of achievement on their state’s proficiency exam in the year before the student enrolled in an online charter school. An equal distribution of students across all deciles would produce a cylinder shape in which every band is the same width. The difference in the width of the top and bottom bands indicates higher enrollment of lower achieving students in online charter schools. Fourteen percent of online charter students were in the first (lowest) decile; whereas, only five percent of online charter students were in the highest decile.

Figure 20: Pre-Online Achievement Decile of Online Charter Students, Math



While there are some differences in the populations attending TPS, the TPS which lost students to online charter schools, and online charter schools, the sample used in our analysis uses pairs of students who are matched on observable characteristics which are known to have an impact on educational growth and achievement. The matched groups are identical or near-identical on all the match criteria shown in Figure 1. Due to the high match rate (96%), we can be confident that the sample of matched students is highly representative of the full population of online charter students in the study states. By using test scores from before enrolling in online schools for our online students in addition to the other demographic factors, our matching process has included a proxy for the sum impact of the all the factors, observable and unobservable, which impact the students' educational outcomes. The prior test score represents the sum educational progress of the student before entering an online charter school; thus students who are identical in observable characteristics and have the same prior test score likely have unobservable student characteristics with the same total impact on achievement for the student and their twin at the time the students were matched. This holds true even if those unobservable characteristics are not necessarily identical between the student and their twin. The identical prior test score then functions as a proxy for the unobservable characteristics of the student. This supports the matched data set as a strong and proper counterfactual for the online charter students.

## Appendix B: TECHNICAL APPENDIX

After constructing a VCR for each charter student, we then set out to develop a model capable of providing a fair measure of charter impact. The National Charter School Research Project provided a very useful guide to begin the process<sup>18</sup>. First, it was useful to consider student growth rather than achievement. A growth measure provided a strong method to control for each student’s educational history as well as the many observable differences between students that affect their academic achievement. The baseline model included controls for each student’s grade, race, gender, free or reduced price lunch status, special education status, English language learner status, and whether they were held back the previous year. The literature on measuring educational interventions<sup>19</sup> found that the best estimation techniques must also include controls for baseline test scores. Each student’s prior year test score is controlled for in our baseline model. Additional controls are also included for state, year, and period (1<sup>st</sup> year in charter, 2<sup>nd</sup> year in charter, etc.). The study’s baseline model is presented below.

$$\Delta A_{i,t} = \theta A_{i,t-1} + \beta X_{i,t} + \rho Y_t + \sigma S + \gamma C_{i,t} + \varepsilon_{i,t} \quad (1)$$

where the dependent variable is

$$\Delta A_{i,t} = A_{i,t} - A_{i,t-1} \quad (2)$$

And  $A_{it}$  is the state-by-test z-score for student  $i$  in period  $t$ ;  $A_{it-1}$  is the state-by-test z-score for student  $i$  in period  $t - 1$ ;  $X_{i,t}$  is a set of control variables for student characteristics and period,  $Y_t$  is a year fixed effect,  $S$  is a state fixed effect;  $C$  is an indicator variable for whether student  $i$  attended an online charter in period  $t$ ; and  $\varepsilon$  is the error term. Errors are clustered around charters schools and their feeder patterns as well.

In addition to the baseline model above, we explored additional interactions beyond a simple binary to indicate online charter enrollment. These included both “double” and “triple” interactions between the charter variable and student characteristics. For example, to identify the impact of charter schools on different racial groups, we estimate models that break the online charter variable into “online charter\_black,” “online charter\_hispanic,” etc. To further break down the impact of online charters by race and poverty, the variables above were split again. For example, black students in charter schools are

---

<sup>18</sup> Betts, J. and Hill, P. et al. (2006). “Key Issues in Studying Charter Schools and Achievement: A Review and Suggestions for National Guidelines.” National Charter School Research Project White Paper Series, No. 2.

<sup>19</sup> Betts, J. and Tang, Y. (2011) “The Effect of Charter Schools on Student Achievement: A Meta-Analysis of the Literature.” National Charter School Research Project.



split further into students that qualify for free and reduced price lunches (“charter\_black\_poverty”) and those that do not (“charter\_black\_nonpoverty”).

As part of the study, we conducted additional analyses using alternative model specifications. The purpose of using additional specifications is to ensure the robustness of the results, i.e. ensure the findings were not an artifact of the analytic model chosen. The alternative specifications for this study included completing the analyses using a data set made with VCRs from brick-and-mortar charter school students, conducting two different ordinary least squares (OLS) models on achievement rather than growth using a multi-year panel of student data for all students with test scores in the states included in the study, and a set of OLS comparisons intended to explore how choice related bias might impact the report findings. The model for the OLS comparison (see model 3 below) was similar to model 1 with the exception that the dependent variable was growth. The results of these analyses are included later in this appendix.

$$A_{i,t} = \theta A_{i,t-1} + \beta X_{i,t} + \rho Y_t + \sigma S + \gamma C_{i,t} + \epsilon_{i,t} \quad (3)$$

We also examined the relationship between student records and responses to the survey administered to school leaders. We assigned the schools’ responses from the survey to the records of students who attended those online schools. We then dropped all students who attended schools which did not have a survey response. This analysis used a model which was a slight variation on model 1 above.

$$\Delta A_{i,t} = \theta A_{i,t-1} + \beta X_{i,t} + \rho Y_t + \sigma S + \eta Q_s + \epsilon_{i,t} \quad (4)$$

Where  $Q_s$  represents the array of responses on the survey for a given online charter school. The other variables were identical to those in model 1 above. The errors were still clustered around charter schools.

### Empirical Bayesian Shrinkage

Tables 13 and 14 in the main body of the report include marginal and full estimates of growth by network for students who attended an online charter school which was part of a charter network. One of the reviewers suggested we might need to conduct empirical Bayesian shrinkage to adjust the estimates due to the differences in the number of students included in each group. We computed the estimated coefficients applying empirical Bayesian shrinkage and found the adjusted estimates were similar to the unadjusted estimates. None of the estimates changed the level of significance or changed by a noticeable amount. Table 34 includes the results for both original estimates and the adjusted estimates of network marginal growth relative to non-network online charter schools. The values in Table 34 are comparable to those in Table 13.

**Table 34: Empirical Bayesian Shrinkage of Effect Sizes by Network Compared to Independent Online Charter Schools, Reading and Math**

	Reading	Reading with EB Shrinkage	Math	Math with EB Shrinkage
Network 1	0.16**	0.13**	0.06	0.06
Network 2	0.08**	0.08**	0.26**	0.26**
Network 3	0.08**	0.07**	0.05	0.04
Network 4	0.04**	0.04**	0.08**	0.07**
Network 5	0.03	0.03	0.19**	0.18**
Network 6	0.03	0.03	0.02	0.02
Network 7	0.00	0.00	0.07	0.06
Network 8	-0.02	-0.02	-0.03	-0.03
Network 9	-0.02	-0.02	0.02	0.02
Network 10	-0.04	-0.04	-0.05**	-0.05**
Network 11	-0.05*	-0.05*	-0.04	-0.03
Network 12	-0.05**	-0.05**	0.03	0.03
Network 13	-0.06	-0.05	-0.04	-0.03
Network 14	-0.06**	-0.06**	-0.01	-0.01
Network 15	-0.07**	-0.07**	-0.07**	-0.07**
Network 16	-0.08**	-0.08**	0.05**	0.05**
Network 17	-0.09**	-0.08**	-0.10**	-0.09**
Network 18	-0.12**	-0.12**	-0.13**	-0.12**
Network 19	-0.17**	-0.16**	-0.26**	-0.25**
Network 20	-0.19**	-0.18**	-0.27**	-0.26**
Network 21	-0.25**	-0.24**	-0.15**	-0.15**

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

Alternative Specifications

Brick-and-Mortar Charter School VCR

This section contains information from the statistical models which compared the matched VCRs made up of brick-and-mortar charter schools to online charter students. Table 35 includes the demographic descriptive output for the brick-and-mortar charter school VCR data set.

**Table 35: Student Population Demographics by Charter Sector**

	All Charters	Charter Feeder Schools	Online Charter Schools
Number of Schools	5,534	906	166
Percent Students in Poverty	51%	49%	48%
Percent English Language Learner Students	9%	7%	1%
Percent Special Education Students	9%	9%	11%
Percent White	33%	42%	69%
Percent Black	30%	21%	13%
Percent Hispanic	29%	27%	11%
Percent Asian/Pacific Islander	4%	4%	2%
Percent Native American	1%	1%	1%
Percent Multi-Racial	3%	3%	4%
Average Total Enrollment per School	344	525	986
Total Enrollment	1,901,109	476,044	163,722

Table 36 includes the effect sizes for attending online charter schools for various subpopulations. The results while slightly different were similar enough to those found in the comparisons between TPS VCRs and online charter students to not merit repeating in the main body of the report. The marginal results are provided here for those with an interest in the results from this second control group.

**Table 36: Effect Size by Subpopulations for Online Charter vs. Brick-Charter, Reading and Math**

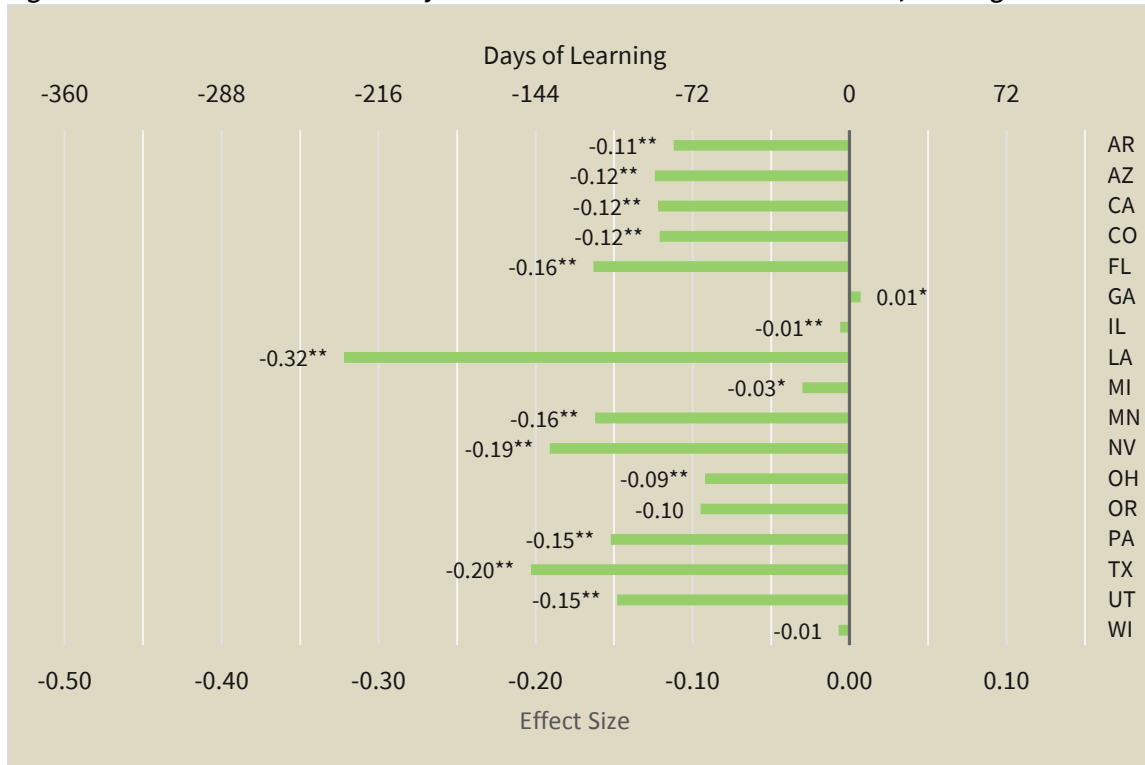
	Reading	Standard Error	Math	Standard Error
Overall	-0.12**	0.01	-0.25**	0.01
White	-0.12**	0.01	-0.23**	0.01
Black	-0.08**	0.03	-0.23**	0.02
Hispanic	-0.13**	0.01	-0.28**	0.02
Asian	-0.08**	0.01	-0.23**	0.02
Native American	-0.07	0.05	-0.32**	0.04

The effects in this table represent the difference between a student of a specific race in TPS and a student of the same race in an online charter.

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

Figures 21 and 22 contain the effect sizes by state from attending an online charter school for reading and math respectively. Comparing Figures 5 and 21 for reading and Figure 6 with Figure 22 for math shows there is some variation in state effect sizes between the two VCR groups, but in general the effect sizes by state for the TPS VCR comparison in the main body and the effect sizes by state for the brick-and-mortar VCR analysis are of the same direction and a similar magnitude. The similarity in results indicates the online nature of the online charter schools is a much stronger driver of their effectiveness than the charter nature. If the charter aspect had a stronger influence, the effect sizes between online charters and brick-and-mortar charter VCRs would differ more from the effect sizes between online charters and TPS VCRs.

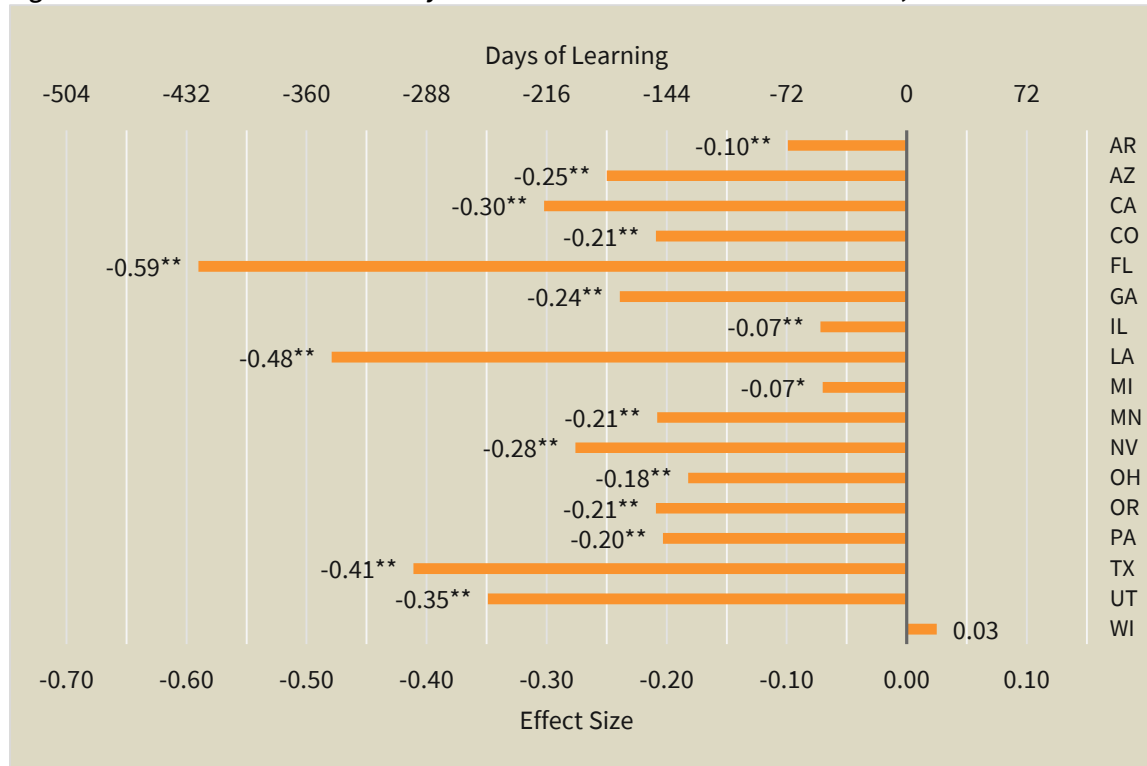
**Figure 21: Online Charter Effect Size by State for Online Charter vs. Brick-Charter, Reading**



The 0.00 line for this graph represents the average Brick-and-Mortar Charter, White, non-poverty, non-ELL, non-SPED student.

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

Figure 22: Online Charter Effect Size by State for Online Charter vs. Brick-Charter, Math



The 0.00 line for this graph represents the average Brick-and-Mortar Charter, White, non-poverty, non-ELL, non-SPED student.

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

#### Generalized OLS Model on Multi-Year Panel Data

For the panel data OLS analysis, we used achievement as the dependent variable. This was done to ensure the findings were not directly related using a growth measure.<sup>20</sup> Partial outputs from the OLS regressions are shown in Table 37. The values for state-level and grade-level controls are not included for the sake of space. In reading, attending an online charter school had a significant negative effect size of -0.135, equivalent to 97 days less learning. In math, the effect size for online charter attendance was -0.347, equivalent to 250 days less learning. Growth for students attending an online charter school were significantly weaker than that of brick-and-mortar charter students. These findings support those presented in the main body of this report.

<sup>20</sup> The growth measure used was  $z_{\text{subj}t1} - z_{\text{subj}t0}$ , where  $z_{\text{subj}}$  was the student's achievement in a given year.

Table 37: Panel Data Unrestricted OLS Regression Output, Reading and Math

	Standard		Standard	
	Reading	Error	Math	Error
z_orig_subj	0.610**	0.000	0.620**	0.000
z_orig_other_subj	0.105**	0.000	0.089**	0.000
charter_brick	0.009**	0.000	-0.011**	0.000
onlinecharter	-0.135**	0.002	-0.347**	0.002
female	0.067**	0.000	-0.024**	0.000
lunch	-0.132**	0.000	-0.128**	0.000
ELL	-0.330**	0.000	-0.149**	0.000
SPED	-0.517**	0.001	-0.488**	0.001
retained	0.053**	0.000	-0.104**	0.000
re_black	-0.150**	0.000	-0.177**	0.000
re_hisp	-0.057**	0.000	-0.052**	0.000
re_asianpi	0.069**	0.000	0.152**	0.000
re_nativam	-0.100**	0.001	-0.097**	0.001
re_multi	-0.015**	0.001	-0.026**	0.001
year_2009	0.012**	0.000	0.016**	0.000
year_2010	0.008**	0.000	0.009**	0.000
year_2011	0.017**	0.000	0.022**	0.000
_cons	0.129**	0.001	0.152**	0.001
Obs	55281185		54030479	
R-Sqr	0.608		0.589	

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

#### Restricted OLS Model on Multi-Year Panel Data

We also analyzed an additional OLS model with a restricted data set. The restrictions to the data set removed all students who did not have a pre-online school observation (they were in an online charter during their first year in the data set) and limited the analysis to the first year in an online charter school. These restrictions allowed us to isolate the specific impact of going to an online charter school, ensuring that estimated effects were not biased by treatment occurring in prior years. This method has been shown to successfully replicate “gold-standard” experimental impact estimates.<sup>21</sup> Table 38 includes the regression results for this analysis. The results of the restricted analysis showed a stronger negative trend than did the unrestricted OLS analysis. Students who attended an online charter analysis had significantly weaker growth in both reading with an effect size of -0.239, equivalent to 172 days less learning and in math with an effect size of -0.445, equivalent to 320 days less learning.

<sup>21</sup> Gill, B., Furgeson, J., Chiang, H., Teh, B., Haimson, J., and Verbitsky-Savitz, N. “Replicating Experimental Impact Estimates in the Context of Control-Group Noncompliance.” Statistics and Public Policy, forthcoming.

To examine if the declining achievement for online students was in fact just a continuation of previously declining achievement, we computed the pre-online charter growth trend for the students who would eventually change to an online school. In the year before they entered an online charter school, the future online students had negative academic growth. The change in reading achievement for this group in the year before they entered an online charter school was -0.06 in reading, equivalent to 43 less days of learning, and -0.08 in math, equivalent to 58 days of learning. The conclusion of these analyses was that while it was true students who eventually transferred to online charter schools had negative growth in TSP before transferring, the steep decline in their growth after transferring to an online charter school indicated that the circumstances which lead to pre-online charter trajectory were not likely to be the source of the students' lowered academic achievement found while attending an online charter school.

**Table 38: Panel Data Restricted OLS Regression Output, Reading and Math<sup>22</sup>**

	Standard		Standard	
	Reading	Error	Math	Error
z_orig_subj	0.599**	0.000	0.610**	0.000
z_orig_other_subj	0.188**	0.000	0.172**	0.000
charter_brick	0.028**	0.000	0.000	0.000
onlinecharter	-0.239**	0.003	-0.445**	0.003
female	0.081**	0.000	-0.035**	0.000
lunch	-0.114**	0.000	-0.096**	0.000
ell	-0.273**	0.000	-0.080**	0.000
sped	-0.265**	0.000	-0.235**	0.000
retained	0.123**	0.002	0.137**	0.002
re_black	-0.116**	0.000	-0.135**	0.000
re_hisp	-0.059**	0.000	-0.046**	0.000
re_asianpi	0.048**	0.000	0.132**	0.000
re_nativam	-0.101**	0.001	-0.095**	0.001
re_multi	-0.012**	0.001	-0.022**	0.001
year_2009	0.001**	0.000	0.012**	0.000
year_2010	-0.006**	0.000	0.001*	0.000
year_2011	0.009**	0.000	0.014**	0.000
_cons	0.082**	0.001	0.080**	0.001
Obs	39526810		38278136	
R-Sqr	0.649		0.605	

The 0.00 value for this table represents the average TPS VCR, White, non-poverty, non-ELL, non-SPED student.

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

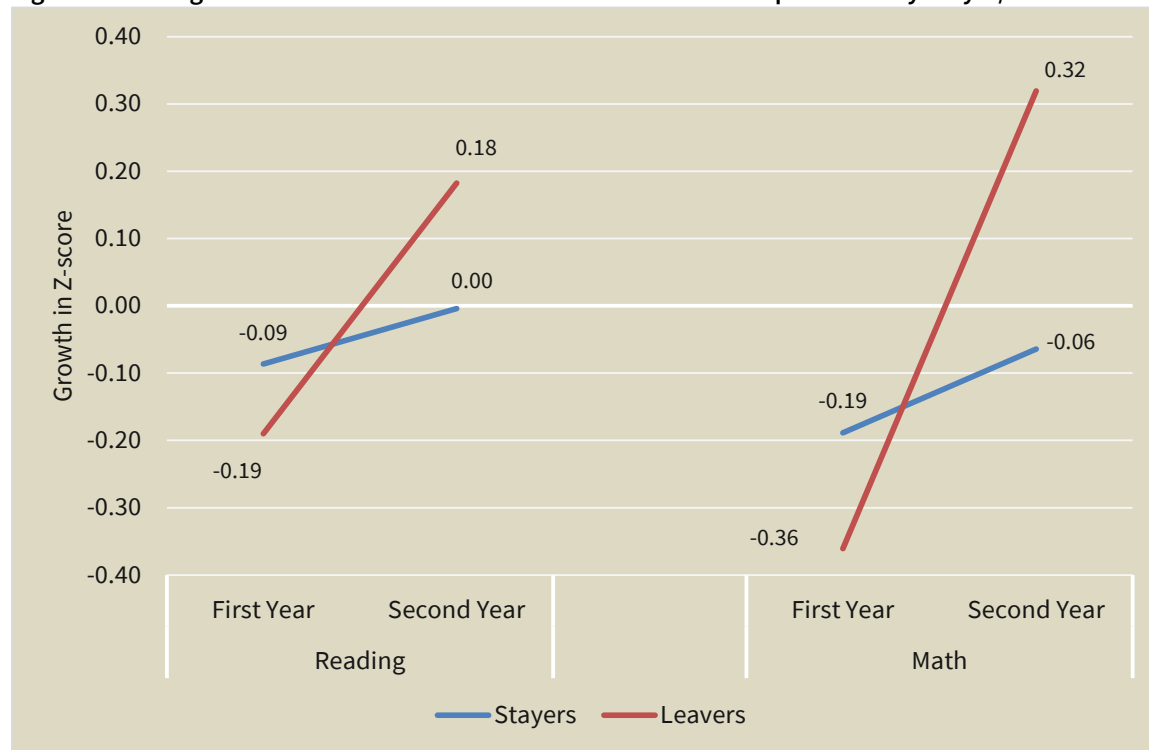
<sup>22</sup> Due to data access limitations, Table 30 did not include data for TX or IL; whereas, Table 29 did. We verified the unrestricted panel data coefficients were the same in models with and without TX and IL included.

Online Charter School Choice Analysis

We next explored deeper the impact of enrollment selection using two “chooser-matched” models which included only those students who attended online charter schools. Both of these models included achievement as the dependent variable and included controls for the student demographic characteristics as well as state specific dummy variables to control for mean differences between states.

In the first model, we kept the records for only the students’ first year in an online charter school and the year after the first year in an online charter school regardless if the second year was in an online charter or not. Figure 23 shows that online charter school students had negative growth.<sup>23</sup> Students who would eventually end up staying in an online charter for only one year, leavers, had weaker first-year growth in online charters than those students who would stay at least two years in an online charter school, stayers. Both leavers and stayers had stronger growth in their second year than in their first year in an online charter school; however, the growth in the second year was significantly smaller for those students who spent their second year in an online school, stayers, compared to those students who returned to a TPS in their second year, leavers.

Figure 23: Average Growth for First Year in Online Charter and Subsequent Year by Stayer/Leaver Status



The 0.00 line for this figure represents the average Online Charter Ever-Attending student.

<sup>23</sup> Growth =  $A_{i,t} - A_{i,t-1}$



We conducted regressions for both reading and math using the same data set as used for the above graph. We included a variable which indicated if the student remained in an online charter school in the second year or returned to a TPS school. The students who stayed in an online charter school for the second year were represented by the coefficient stayer. Those who returned to TPS were represented by the coefficient leaver. The stayer coefficient is the marginal difference between the students who remained in online charter schools for the second year and the students who returned to a TPS school, leavers. The average change in achievement for the leavers is represented by the coefficient leaver. In reading, the students who left online charter schools after one year had second year growth of 0.33 standard deviations (the equivalent to 238 days of additional learning). The average growth of students who remained in online charter schools lagged behind that of those who left by -0.16 standard deviations (the equivalent of 115 days less learning).

**Table 39: Continuing Online Charter Enrollees Compared to One Year Enrollees – Marginal Results, Reading**

	Coefficient	se
z_orig_read	0.64**	0.003
z_orig_math	0.18**	0.003
stayer marginal to leaver	-0.16**	0.006
leaver	0.33**	0.006
female	0.09**	0.004
lunch	-0.08**	0.004
ell	-0.15**	0.018
sped	-0.18**	0.008
retained	0.19**	0.012
re_black	-0.06**	0.006
re_hisp	-0.05**	0.006
re_asianpi	0.05**	0.010
re_nativam	-0.07**	0.020
re_multi	0.00	0.011
year_2009	-0.09**	0.006
year_2010	-0.13**	0.006
year_2011	-0.13**	0.008
_cons	0.01	0.011
Obs	107106	
R-Sqr	0.654	

The 0.00 value for this table represents the average Online Charter, White, non-poverty, non-ELL, non-SPED student.

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

In math, the differences between stayers and leavers was even larger. The students who left online charter schools to return to a TPS school had second year growth of 0.55 standard deviations (equivalent to 396 days of learning). Those who remained in online charter schools had growth which was on average -0.39 standard deviations (equivalent to 281 days of learning) less than the students who left online charter schools. The direction and magnitude of the coefficients from this analysis were consistent with those of the other analyses conducted.

**Table 40: Continuing Online Charter Enrollees Compared to One Year Enrollees – Marginal Results, Math**

	Coefficient	se
z_orig_math	0.60**	0.003
z_orig_read	0.20**	0.003
stayer marginal to leaver	-0.39**	0.006
leaver	0.55**	0.007
Female	-0.06**	0.004
lunch	-0.09**	0.004
ell	0.018	0.017
sped	-0.12**	0.007
retained	0.13**	0.011
re_black	-0.09**	0.006
re_hisp	-0.05**	0.006
re_asianpi	0.12**	0.012
re_nativam	-0.08**	0.019
re_multi	-0.013	0.012
year_2009	-0.08**	0.006
year_2010	-0.15**	0.006
year_2011	-0.11**	0.008
_cons	-0.15**	0.011
Obs	103136	
R-Sqr	0.631	

The 0.00 value for this table represents the average Online Charter, White, non-poverty, non-ELL, non-SPED student.

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

The last analysis we conducted was the future online charter choosers analysis. For this analysis, we kept only students who would eventually attend an online charter school but who attended a TPS during their first year in the data set. We then kept their first year in the data set and their first year in an online charter school. We created a variable to indicate their enrollment in an online charter school. The model included student achievement as the dependent variable and student demographic characteristics as

independent variables.<sup>24</sup> The regression results in Table 41 show attending an online charter school had a significant negative impact on reading achievement, -0.17 standard deviations (122 days). Likewise the impact on math achievement of attending an online charter school (see Table 42) was -0.34 standard deviations (245 days) compared to the students’ first year in the data set.

**Table 41: Future Online Charter Choosers, Reading**

	Coefficient	se
z_orig_read	0.65**	0.003
z_orig_math	0.17**	0.003
read_missing	-0.22**	0.052
onlinecharter	-0.17**	0.009
female	0.09**	0.004
lunch	-0.07**	0.004
ell	-0.14**	0.016
sped	-0.20**	0.008
retained	0.07**	0.008
re_black	-0.06**	0.006
re_hisp	-0.03**	0.005
re_asianpi	0.06**	0.009
re_nativam	-0.03	0.017
re_multi	0.03*	0.011
year_2009	0.02**	0.008
year_2010	0.03**	0.009
year_2011	0.08**	0.010
_cons	-0.02	0.010
Obs	120376	
R-Sqr	0.622	

The 0.00 value for this table represents the average TPS VCR, White, non-poverty, non-ELL, non-SPED student.

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

<sup>24</sup> State dummy variables and grade-level dummy variables were included in the model, but are not shown in the results table to conserve space.

**Table 42: Future Online Charter Choosers, Math**

	Coefficient	se
z_orig_math	0.61**	0.003
z_orig_read	0.17**	0.003
math_missing	-2.12**	0.176
onlinecharter	-0.34**	0.009
female	-0.04**	0.004
lunch	-0.07**	0.004
ell	-0.03	0.016
sped	-0.17**	0.008
retained	0.02**	0.007
re_black	-0.09**	0.006
re_hisp	-0.04**	0.005
re_asianpi	0.13**	0.011
re_nativam	-0.06**	0.017
re_multi	0.01	0.011
year_2009	0.01	0.008
year_2010	-0.00	0.009
year_2011	0.07**	0.010
_cons	-0.06**	0.010
Obs	118157	
R-Sqr	0.612	

The 0.00 value for this table represents the average TPS VCR, White, non-poverty, non-ELL, non-SPED student.

\* Denotes significant at the .05 level. \*\* Denotes significant at the .01 level.

## Appendix C: CORRELATES OF SCHOOL-LEVEL EFFECTS WITH SURVEY RESPONSES

Appendix C contains correlations between school-level effect sizes and the responses to the survey of online charter school practices conducted by Mathematica. Correlations could not be computed for survey items with inadequate variation of responses. For example, if all the responses to a binary question (yes/no) were the same, a correlation cannot be computed. Items for which a correlation could not be computed are marked with a dash “-“.

Table 43 includes the correlations and p-values for each item with sufficient variation. Those values which are significant at the .05 level are marked with a “\*”. Due to the high number of correlations computed, it is likely at least some (5%) will be significant by chance. Based on the statistical principles used in this study, we expect 12 of the significant results in each subject to be the result of chance. To aid the reader in interpreting the results, we have included the p-value for each correlation. A lay explanation of the p-value is that the p-value represents the likelihood a correlation is the result of chance. The lower the p-value; the lower the likelihood that the result is due to chance. The traditional threshold for determining significance is a p-value of .05 or less. Correlations with large p-values should be considered to be due to chance regardless of the strength of the correlation.

The column Response Type in Table 43 provides information on the type of response possible on the survey. The description ‘binary’ means the value of “1” was entered in the field if the practice in the survey question existed at the school and “0” if it did not. This means a positive correlation indicates that the presence of the practice described was related to stronger growth than the average online charter school while a negative correlation indicates the presence of the practice was related to weaker growth. The description ‘ascending’ means the value was dosage-based and coded with a higher number if the condition occurred more frequently. Thus a positive correlation means more of the practice is related to stronger growth. Finally, the description ‘descending’ means the value was dosage-based and coded with a lower number if the practice occurred more frequently. For a descending item, a positive correlation would indicate having less of the practice present in the school is associated with stronger growth. Readers are advised to pay attention to the Response Type as it will have an impact on the interpretation of the results.

For dosage based variables, the correlations were produced using standard Pearson correlations. Correlations between binary variables and school-level effects were computed using a point bi-serial model which produces correlations between a binary and continuous variable equivalent to Pearson correlation.

Table 43: Correlations of School-Level Effects with Survey Responses, Math and Reading

	<b>Coeffi</b>	<b>p-</b>	<b>Coeffi</b>	<b>p-</b>	<b>Response</b>	
	<b>cient</b>	<b>value</b>	<b>Sig</b>	<b>cient</b>	<b>value</b>	
					<b>Sig</b>	
					<b>Type</b>	
<b>Does your school’s program enable students to earn course credits by demonstrating mastery, regardless of “seat time”?</b>						
No, students in all courses must meet seat time requirements	0.12	0.3811		-0.03	0.8143	Binary
Yes, students in <u>any</u> course can earn course credit by demonstrating mastery	0.04	0.7478		0.04	0.7504	Binary
Students in <u>selected</u> courses, subjects, or grades can earn course credit through demonstration of mastery	-0.35	0.0056	*	-0.33	0.0098	*
<b>Does your school’s program include courses that are <u>entirely self-paced</u>?</b>	0.00	0.9830		-0.12	0.4232	Binary
<b>What percent of your courses are <u>entirely self-paced</u>?</b>	-0.05	0.7699		-0.10	0.5871	Ascending
<b>In <u>total</u>, how much time is spent in synchronous instruction, <u>each week</u>, for an average student in the fourth grade?</b>	0.10	0.5759		0.37	0.0308	*
<b>How many students are involved in a typical fourth-grade <u>math</u> section?</b>	0.37	0.1122		0.07	0.7554	Ascending
<b>How many students are involved in a typical fourth-grade <u>English / Language Arts</u> section?</b>	0.37	0.1122		0.07	0.7554	Ascending

	Coeffi cient	p- value	Sig	Coeffi cient	p- value	Sig	Response Type
<b>In an average week, does a typical student in fourth grade spend any time in <u>one-on-one interaction with a teacher or tutor (via chat, phone, tutoring, etc.)?</u></b>	-0.19	0.3034		-0.30	0.1061		Binary
<b>How much time, on average, does a typical student in fourth grade spend in <u>one-on-one interaction with a teacher or tutor (via chat, phone, tutoring, etc.) per week?</u></b>	-0.07	0.7214		-0.17	0.4157		Ascending
<b>Who provides one-on-one instructional support to students in fourth grade?</b>							
Teacher of record for the course	0.25	0.2392		0.03	0.8863		Binary
Tutor/Coach	-0.45	0.0255	*	-0.11	0.6152		Binary
[Removed]							Binary
Other instructional staff, not listed above - Specify:	-	-		-	-		Binary
Other teacher	-	-		-	-		Binary
Special education faculty	0.53	0.0076	*	0.41	0.0478	*	Binary
Parent	-	-		-	-		Binary
<b>How frequently are the following instructional method(s) used in fourth grade?</b>							
Lecture	-0.12	0.5693		0.16	0.4331		Descending
Teacher-guided synchronous discussion	-0.33	0.1128		-0.25	0.2294		Descending
Collaborative learning involving two or more students working together	0.07	0.7302		-0.27	0.1895		Descending
Individualized, student-driven independent study	-0.29	0.1611		-0.33	0.1060		Descending
<b>What role, if any, is a <u>parent or guardian</u> expected to play to support the educational program of a student in the <u>fourth grade</u>?</b>							
Make sure the student keeps up with assignments	-	-		-	-		Binary

	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Response Type</b>
Actively participate in the student's instruction	-0.42	0.0376	*	0.29	0.1593		Binary
Participate in parent training sessions	0.06	0.7698		0.03	0.9054		Binary
Verify seat time	-0.02	0.9197		0.21	0.3047		Binary
Other role, not listed above - Specify:	-	-		-	-		Binary
<b>In total, how much time is spent in synchronous instruction, each week, for an average student in the seventh grade?</b>	-0.02	0.8937		0.10	0.5566		Ascending
<b>How many students are involved in a typical seventh-grade math section?</b>	0.26	0.2591		0.03	0.8993		Ascending
<b>How many students are involved in a typical seventh-grade English / Language Arts section?</b>	0.27	0.2393		0.03	0.8936		Ascending
<b>In an average week, does a typical student in seventh grade spend any time in one-on-one interaction with a teacher or tutor (via chat, phone, tutoring, etc.)?</b>	-0.23	0.1697		-0.28	0.0834		Binary
<b>In an average week, how much time does a typical student in seventh grade spend in one-on-one interaction with a teacher or tutor (via chat, phone, tutoring, etc.) per week?</b>	-	-		-	-		Ascending
<b>Who provides one-on-one instructional support to students in seventh grade?</b>							
Teacher of record for the course	-	-		-	-		Binary
Tutor/Coach	-0.45	0.0177	*	0.20	0.2870		Binary
[Removed]							Binary



	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Response Type</b>
Other instructional staff, not listed above - Specify:	-	-		-	-		Binary
Other teacher	-	-		-	-		Binary
Special education faculty	-	-		-	-		Binary
Parent	-	-		-	-		Binary
<b>How frequently are the following instructional method(s) used in seventh grade?</b>							
Lecture	-0.19	0.3162		-0.10	0.5929		Descending
Teacher-guided synchronous discussion	-0.41	0.0209	*	-0.10	0.5600		Descending
Collaborative learning involving two or more students working together	0.21	0.2550		0.01	0.9564		Descending
Individualized, student- driven independent study	-0.19	0.3093		-0.19	0.2996		Descending
<b>What role, if any, is a parent or guardian expected to play to support the educational program of a student in the seventh grade?</b>							
Make sure the student keeps up with assignments	-	-		-	-		Binary
Actively participate in the student's instruction	-0.27	0.1392		0.24	0.1779		Binary
Participate in a parent training sessions	-0.03	0.8642		-0.22	0.2145		Binary
Verify seat time	-0.10	0.5810		0.14	0.4393		Binary
Other role, not listed above - Specify:	-	-		-	-		Binary
<b>In total, how much time is spent in synchronous instruction, each week, for an average student in high school?</b>	-0.25	0.1350		0.01	0.9715		Ascending
<b>How many students are involved in a typical high school <u>math</u> section?</b>	0.14	0.5604		0.01	0.9552		Ascending
<b>How many students are involved in a typical high school <u>English</u> section?</b>	0.14	0.5592		0.02	0.9470		Ascending

	Coeffi cient	p- value	Sig	Coeffi cient	p- value	Sig	Response Type
<b>In an average week, does a typical high school student spend any time in <u>one-on-one</u> interaction with a teacher or tutor (via chat, phone, tutoring, etc.)?</b>	-	-		-	-		Binary
<b>In an average week, how much time does a typical student in high school spend in <u>one-on-one</u> interaction with a teacher or tutor (via chat, phone, tutoring, etc.)?</b>	-	-		-	-		Ascending
<b>Who provides one-on-one instructional support to students in high school?</b>							
Teacher of record for the course	-	-		-	-		Binary
Tutor/Coach removed	-0.52	0.0030	*	0.00	0.9830		Binary
Other instructional staff, not listed above - Specify:	-	-		-	-		Binary
Other teacher	-	-		-	-		Binary
Special education faculty	-	-		-	-		Binary
Parent	-	-		-	-		Binary
<b>How frequently are the following instructional method(s) used in high school?</b>							
Lecture	-0.25	0.1729		-0.08	0.6406		Descending
Teacher-guided synchronous discussion	-0.16	0.3884		-0.07	0.7145		Descending
Collaborative learning involving two or more students working together	0.25	0.1733		-0.03	0.8594		Descending
Individualized, student-driven independent study	-0.34	0.0593		0.01	0.9396		Descending
<b>What role, if any, is a parent or guardian expected to play to support the educational program of a student in high school?</b>							
Make sure the student keeps up with assignments	-	-		-	-		Binary

	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Response Type</b>
Actively participate in the student's instruction	-0.21	0.2477		0.24	0.1681		Binary
Participate in parent training sessions	0.01	0.9637		-0.11	0.5422		Binary
Verify seat time	-0.05	0.7852		0.08	0.6621		Binary
Other role, not listed above - Specify:	-	-		-	-		Binary
<b>Where does the school's curriculum content come from? Please select the response below that best applies to the majority of your school's curriculum.</b>							
Purchased from outside provider(s)	-0.15	0.2514		-0.13	0.3277		Binary
Provided by a school management organization that oversees our school	0.16	0.2347		-0.05	0.6897		Binary
Developed in-house and used by all instructors of the relevant courses	-0.09	0.5100		-0.01	0.9579		Binary
Developed in-house by individual course instructors	-0.12	0.0362	*	-0.04	0.7762		Binary
<b>Who monitors teachers' contact with students and parents?</b>							
Contact is not formally monitored	-	-		-	-		Binary
Principal	-0.16	0.2482		-0.07	0.5890		Binary
Other school administrator	-0.01	0.9178		-	-		Binary
Lead mentor/ teacher	0.01	0.9482		-0.03	0.8233		Binary
Other staff, not listed above	-0.08	0.5708		-0.01	0.9672		Binary
<b>Do you have school-wide policies spelling out expectations for students in terms of ...</b>							
Completion of assignments?	-	-		-	-		Binary
Class participation?	0.37	0.0303	*	0.25	0.1384		Binary
Attendance in synchronous instruction?	0.24	0.1577		-0.02	0.9211		Binary
<b>Does your school monitor attendance or student participation in any of the following ways?</b>							
Pace of student's completion of course assignments	-	-		-	-		Binary
Activity in the online system	-0.27	0.0858		-0.38	0.0097	*	Binary

	Coeffi cient	p- value	Sig	Coeffi cient	p- value	Sig	Response Type
Seat time involved in synchronous work with a teacher	0.20	0.2004		0.22	0.1423		Binary
Other measure of completion of course work - Specify:	-	-		-	-		Binary
<b>Below is a list of programs and supports schools can offer to students. For each, please indicate whether your school offers this program or support.</b>							
One-on-one tutoring for struggling learners	-	-		-	-		Binary
Supplemental group instruction for struggling learners	-0.12	0.4924		-0.29	0.0903		Binary
Dropout prevention or dropout recovery program	0.10	0.5664		0.01	0.9369		Binary
Study-skills classes	0.08	0.6694		-0.13	0.4671		Binary
Clubs or activities (e.g., literary magazine, cultural activity groups, pep club)	0.14	0.4254		0.12	0.5030		Binary
Mental/behavioral health services	0.07	0.6747		0.03	0.8526		Binary
Music instruction	0.19	0.2931		-	-		Binary
Fine arts instruction	0.16	0.3574		-0.03	0.8439		Binary
Specialized instruction for English-language learners	0.18	0.3123		0.11	0.5316		Binary
Speech and language therapy or services	-	-		-	-		Binary
Talented/gifted program	0.41	0.0156	*	0.27	0.1150		Binary
Other services for students with IEPs	-	-		-	-		Binary
<b>Please indicate whether your school offers any of the following programs or supports to high school students.</b>							
Advanced Placement Courses	0.10	0.5568		-0.17	0.2763		Binary
International Baccalaureate program	-	-		-	-		Binary
Supports for students who have children of their own	-0.09	0.5986		-0.31	0.0462	*	Binary

	Coeffi cient	p- value	Sig	Coeffi cient	p- value	Sig	Response Type
<b>How many students at this school participate in the <u>dropout prevention or dropout recovery program?</u></b>	0.03	0.8885		-0.19	0.3620		Ascending
<b>How many students at this school participate in <u>Advanced Placement Courses?</u></b>	0.29	0.1375		-0.08	0.6758		Ascending
<b>How many students at this school participate in the <u>International Baccalaureate program?</u></b>	-	-		-	-		Ascending
<b>On average, approximately how often do teachers conduct assessments of students in a typical ...</b>							
4 <sup>th</sup> grade math section	-0.49	0.0197	*	-0.16	0.4728		Descending
4 <sup>th</sup> grade English / Language Arts section	-0.49	0.0197	*	-0.16	0.4728		Descending
<b>On average, approximately how often do teachers conduct assessments of students in a typical ...</b>							
7 <sup>h</sup> grade math section	-0.37	0.0547	*	-0.11	0.5809		Descending
7 <sup>h</sup> grade English / Language Arts section	-0.42	0.0294	*	-0.14	0.4644		Descending
<b>On average, approximately how often do teachers conduct assessments of students in a typical ...</b>							
High school math section	0.03	0.8825		0.10	0.5685		Descending
High school English section	-0.05	0.7862		0.04	0.7400		Descending
<b>Does the school systematically conduct an entry assessment for students who have just enrolled using any of the following measures or methods?</b>							
Academic skills	0.05	0.7860		0.01	0.9332		Binary
English-language skills	0.27	0.1419		0.30	0.0823		Binary
Potential barriers for online learning	0.20	0.2769		0.12	0.5132		Binary
Level of parent or other home supports for online learning	0.27	0.1290		0.33	0.0539	*	Binary
Learning Disabilities	0.11	0.5338		0.34	0.0495	*	Binary
Any disabilities other than learning disabilities	0.11	0.5564		0.12	0.4990		Binary
Pull student's records from previous school(s)	-	-		-	-		Binary

	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Response Type</b>
Phone call to household	0.17	0.3412		-0.02	0.9053		Binary
Home visit	-0.23	0.2044		-0.04	0.8268		Binary
<b>Does this school promote student performance on state assessments in any of the following ways?</b>							
Test preparation embedded in regular courses	0.09	0.6025		-0.09	0.5979		Binary
Separate test preparation course required in relevant grades/ subjects	0.25	0.1557		0.17	0.3340		Binary
Intensive, targeted support for students who may have difficulty achieving proficiency standards on state assessments	0.33	0.0583		0.17	0.3268		Binary
<b>How frequently does your school actively send parents information on their child's progress via email, phone, or postal mail?</b>	0.11	0.4843		-0.05	0.7277		Ascending
<b>Does this progress report for parents include a measure of student engagement or participation?</b>	-	-		-	-		Binary
<b>How does your school respond when students are identified as disengaged?</b>							
Email parent	-	-		-	-		Binary
Personal call to parent(s)	-	-		-	-		Binary
Automated call to parent(s)	0.16	0.3054		-0.07	0.6454		Binary
Visit home	-0.03	0.8655		-0.18	0.2433		Binary
Enlist social services	0.10	0.5260		0.09	0.5592		Binary
Offer student incentive to participate	0.03	0.8628		0.00	0.9868		Binary
Other response, not listed above – specify:	0.33	0.0341	*	0.20	0.1887		Binary
Letter mailed to home	0.21	0.1824		0.21	0.1734		Binary
<b>Are any of the following tools used to support asynchronous instruction?</b>							
Email	-	-		-	-		Binary

	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Response Type</b>
Physical (paper) textbooks	0.17	0.3425		0.14	0.4357		Binary
Online textbooks	0.04	0.8443		-0.10	0.5846		Binary
Interactive online exercises	-	-		-	-		Binary
Other websites with instructional focus or content	-0.03	0.8888		0.19	0.2815		Binary
Recordings of lectures	0.06	0.7528		-0.14	0.4373		Binary
Discussion forums or threaded discussion groups	-0.23	0.1970		-0.01	0.9478		Binary
Social media (blogs, wiki)	-0.08	0.6497		-0.01	0.9743		Binary
Other tool not listed above (specify)	-0.24	0.1790		0.02	0.9180		Binary
<b>Are any of the following tools used to support synchronous instruction?</b>							
Video conferencing (Skype, FaceTime, etc.)	-0.14	0.4460		-0.03	0.8802		Binary
Screen sharing/web conferencing	0.01	0.9636		-0.24	0.1785		Binary
Audio conferencing	0.34	0.0551		0.10	0.5689		Binary
Online chat forum	0.02	0.9243		-0.13	0.4793		Binary
Instant messaging (IM) or other one-on-one chats	-0.30	0.0983		-0.14	0.4381		Binary
Phone calls	-0.03	0.8525		-0.03	0.8523		Binary
Text messaging	-0.28	0.1687		-0.07	0.7366		Binary
Other tool not listed above (specify)	0.47	0.0346	*	0.33	0.1431		Binary
<b>What types of technology, if any, does this school provide, without charge, to students?</b>							
Internet connection (e.g. internet service or subsidy for internet service, modem, router, and/or hotspot)	-0.13	0.4555		-0.08	0.6500		Descending
Computer (e.g. laptop or desktop computer, or tablet computer such as iPad)	0.03	0.8607		-0.08	0.6493		Descending
Computer Accessories (e.g. webcam, microphone, head set, cd/dvd drive, printer, or scanner)	0.08	0.6556		-0.02	0.8928		Descending

	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Response Type</b>
Assistive Technology for students with disabilities	0.01	0.9780		-0.32	0.0627		Descending
<b>Does the school provide tech support to teachers in any of the following ways?</b>							
No tech support is provided to teachers at this school	-	-		-	-		Binary
Live, personal support (via phone or chat)	-0.11	0.4172		-0.19	0.1542		Binary
Manuals, written guides, or FAQ documents	-0.02	0.8683		-0.17	0.2035		Binary
Other support, not listed above (specify)	-	-		-	-		Binary
<b>When is live, personal tech support available to teachers?</b>							
Weekdays during business hours	-	-		-	-		Binary
Weekday evenings	0.34	0.0557		0.20	0.2507		Binary
Weekends	-0.12	0.4952		0.25	0.1443		Binary
<b>How is tech support provided to students?</b>							
No tech support is provided to students at this school	-	-		-	-		Binary
Manuals, technical guides, FAQ documents	-0.10	0.4596		-0.23	0.0898		Binary
Live phone or chat support	-0.06	0.6775		-0.10	0.4799		Binary
Troubleshooting via remote control of computer	-0.10	0.4830		-0.20	0.1433		Binary
Online ticketing system	-0.19	0.1620		0.23	0.0830		Binary
In-person set up of computer	-0.39	0.0033	*	-0.23	0.0795		Binary
Other support, not listed above (specify)	-	-		-	-		Binary
<b>When is live, personal tech support available to students?</b>							
Weekdays during business hours	-	-		-	-		Binary
Weekday evenings	0.30	0.0580		0.21	0.1827		Binary
Weekends	0.10	0.5213		0.11	0.4786		Binary
<b>In total, how many teachers are currently employed at this school? (full-time)</b>	0.26	0.1020		-0.06	0.7234		Ascending



	Coeffi cient	p- value	Sig	Coeffi cient	p- value	Sig	Response Type
<b>In total, how many teachers are currently employed at this school? (part-time)</b>	-0.05	0.7765		0.05	0.7410		Ascending
<b>What is the total number of full-time equivalent (FTE) teachers employed by the school?</b>	0.23	0.1654		-0.07	0.6750		Ascending
<b>How many of the following other instructional and support staff (including those contracted for services) work in this school (in FTE units)?</b>							
Teacher aides/instructional assistants	0.06	0.7362		0.13	0.4602		Ascending
Tutors	-0.06	0.7673		-0.22	0.2590		Ascending
Guidance counselors	0.39	0.0266	*	-0.01	0.9696		Ascending
Other instructional support staff	0.20	0.3043		-0.07	0.7021		Ascending
<b>From the list below, please rank the three most important factors when deciding which candidates to offer jobs.</b>							
Commitment to this school's mission / willingness to work hard	-0.01	0.9152		-0.16	0.2334		Binary
Certification status (holds a valid teaching certificate)	-0.15	0.2465		-0.15	0.2493		Binary
College grade point average (GPA)	-	-		-	-		Binary
College major in content area to be taught	0.08	0.5689		0.04	0.7600		Binary
Score on a test (e.g. Praxis)	-	-		-	-		Binary
Experience teaching courses online	-0.17	0.1823		-0.19	0.1377		Binary
General experience as a teacher	0.04	0.7652		-0.04	0.7379		Binary
Master's degree	-	-		-	-		Binary
Performance in teaching sample class	0.16	0.2099		0.06	0.6566		Binary
Quality of candidate's pre-service teacher training program	-	-		-	-		Binary

	Coeffi cient	p- value	Sig	Coeffi cient	p- value	Sig	Response Type
Other factor(s), not listed - specify:	-	-		-	-		Binary
<b>Are your school's teachers covered by a collective bargaining agreement?</b>	0.09	0.6093		0.22	0.2049		Binary
<b>Do teachers come to a central location to do most of their online teaching, or do they do most of their teaching from their homes?</b>	-0.18	0.2527		-0.09	0.5722		Binary
<b>Is the teacher of record for a particular class responsible for ...</b>							
Lesson planning?	-0.27	0.1216		-0.05	0.7929		Binary
Developing curriculum?	-0.55	0.0009	*	-0.24	0.1634		Binary
Lecturing?	0.08	0.4679		-0.26	0.1352		Binary
Grading student work?	-	-		-	-		Binary
One-on-one tutoring?	0.21	0.2353		0.03	0.8589		Binary
Identifying struggling learners?	-	-		-	-		Binary
Communicating with parents?	-	-		-	-		Binary
Managing online learning environments (e.g. online forums or discussion boards)?	0.00	0.9845		-0.15	0.1409		Binary
Troubleshooting technical issues?	-0.10	0.5890		-0.05	0.7620		Binary
Other - Specify:	0.05	0.7998		0.14	0.4218		Binary
<b>Which of the following statements best describes the expectation for most 4th grade teachers of core academic subjects (reading, math, science, or social studies)?</b>							
Most 4 <sup>th</sup> -grade core academic teachers specialize in a subject	-	-		-	-		Binary
Most 4th-grade core academic teachers are generalists, responsible for multiple subjects	0.03	0.8129		-0.10	0.4421		Binary
<b>Approximately how many students, in total, is a full-time 4th grade teacher typically expected to teach?</b>	0.05	0.7952		0.22	0.2648		Ascending

	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Response Type</b>
<b>Approximately how many students, in total, is a <u>full-time</u> 7<sup>th</sup> grade teacher typically expected to teach?</b>	-0.05	0.7558		-0.04	0.7964		Ascending
<b>Approximately how many students, in total, is a <u>full-time</u> high school teacher typically expected to teach?</b>	-0.02	0.8930		0.08	0.6477		Ascending
<b>Approximately how many students, in total, is a <u>part-time</u> 4th grade teacher typically expected to teach?</b>	-	-		-	-		Ascending
<b>Approximately how many students, in total, is a <u>part-time</u> 7<sup>th</sup> grade teacher typically expected to teach?</b>	-	-		-	-		Ascending
<b>Approximately how many students, in total, is a <u>part-time</u> high school teacher typically expected to teach?</b>	-	-		-	-		Ascending
<b>Does a typical <u>fourth-grade math</u> class include instructional staff in addition to the teacher (e.g. aides, tutors)?</b>	0.39	0.0779		0.28	0.2145		Binary
<b>Does a typical <u>fourth-grade English / Language Arts</u> class include instructional staff in addition to the teacher (e.g. aides, tutors)?</b>	0.36	0.1029		0.23	0.3035		Binary

	Coeffi cient	p- value	Sig	Coeffi cient	p- value	Sig	Response Type
Does a typical <u>seventh-grade math</u> class include instructional staff in addition to the teacher (e.g. aides, tutors)?	0.31	0.1102		0.17	0.3674		Binary
Does a typical <u>seventh-grade English / Language Arts</u> class include instructional staff in addition to the teacher (e.g. aides, tutors)?	0.23	0.2564		0.05	0.7846		Binary
Does a typical <u>high-school math</u> class include instructional staff in addition to the teacher (e.g. aides, tutors)?	0.15	0.4445		0.18	0.3192		Binary
Does a typical <u>high school English</u> class include instructional staff in addition to the teacher (e.g. aides, tutors)?	0.14	0.4663		0.03	0.8709		Binary
Does this school provide teachers with paid time for professional development?	-	-		-	-		Binary
During the 2013-2014 school year, how frequently did a typical teacher participate with other teachers from this school in <u>synchronous, online</u> professional development?	-0.03	0.8807		-0.38	0.0263	*	Ascending

	Coeffi cient	p- value	Sig	Coeffi cient	p- value	Sig	Response Type
<b>During the 2013-2014 school year, how frequently did a typical teacher participate with other teachers from this school in <u>in-person</u> professional development at a central location?</b>	0.02	0.9206		0.11	0.5423		Ascending
<b>During the 2013-2014 school year, how frequently did a typical teacher participate with other teachers in regular faculty meetings (online or in person) for this school?</b>	-0.18	0.3214		-0.03	0.8671		Ascending
<b>How many times during the 2013-2014 school year did teachers experience the following at your school?</b>							
Observed by and received feedback from a <u>peer</u>	-0.02	0.9206		-0.01	0.9375		Ascending
Observed by and received feedback from a <u>master teacher</u> or someone else who coaches teachers	-0.10	0.5730		-0.37	0.0279	*	Ascending
Observed by and received feedback from a <u>principal</u> , administrator, or someone else who monitors performance	0.19	0.2804		0.13	0.4711		Ascending
Provided with diagnostic test results for individual students to help them determine which topics/skills to focus on	0.34	0.0531	*	0.04	0.8230		Ascending
Asked to submit lesson plans to master teacher, department chair, principal, or other administrator for review	-0.04	0.8407		0.28	0.1069		Ascending

	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Response Type</b>
Attended workshops, conferences, or other kinds of group-based training	0.05	0.0784		0.10	0.5682		Ascending
<b>Please rank, in order, the three most important factors considered when evaluating teachers at this school.</b>							
Observations of teacher's instruction	-0.01	0.9328		0.12	0.3776		Binary
Teacher's accessibility to students (e.g. logs of student-teacher communication, response time to student inquiries, time to grade and return assignments)	-0.14	0.2755		0.01	0.9224		Binary
Feedback from other teachers or instructional coaches	0.25	0.0559		0.06	0.6356		Binary
Feedback from students or parents	0.08	0.5290		0.17	0.1866		Binary
Student course completion rate	0.13	0.3215		-0.45	0.0003	*	Binary
Student achievement growth	0.21	0.1101		-0.09	0.4710		Binary
Portfolio of examples of student work (e.g., student essays, lab reports)	-	-		-	-		Binary
Meeting expectations for student engagement	0.00	0.9755		-0.17	0.1869		Binary
Other factor(s), not listed - specify:	-	-		-	-		Binary
<b>Are teachers in your school paid more based on any of the following:</b>							
Teacher evaluation results	0.29	0.1061		0.08	0.6693		Binary
Student achievement growth	0.41	0.0202	*	0.30	0.0901		Binary
Student proficiency levels	0.08	0.6577		0.21	0.2333		Binary
Course completion rates of students	0.17	0.3588		0.26	0.1327		Binary

	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Response Type</b>
Advanced degrees, such as master's degrees or doctoral degrees	0.39	0.0266	*	0.05	0.7928		Binary
Teaching experience	0.12	0.5041		0.19	0.2763		Binary
Additional certifications	0.11	0.5412		0.25	0.1487		Binary
Filling a hard-to-staff position	0.09	0.6099		0.13	0.4603		Binary
Number of students taught	-0.20	0.2615		0.03	0.8731		Binary
Serving as a mentor or coach to other teachers	-0.10	0.6005		0.08	0.6361		Binary
<b>Can teachers at this school earn tenure?</b>	0.31	0.0501	*	0.13	0.4097		Binary
<b>What opportunities do instructional staff in your school have to take on additional responsibilities to advance their careers?</b>							
Supervise junior teachers (as a department chair or lead teacher)	0.25	0.1668		0.00	0.9964		Binary
Become an instructional coach or master teacher	0.28	0.1185		0.03	0.8650		Binary
Teach more and/or larger classes	-0.19	0.3057		-0.07	0.7014		Binary
Lead professional development for groups of staff	0.25	0.1652		-0.01	0.9591		Binary
<b>Approximately how long do teachers stay with the school on average (months)?</b>	-	-		-	-		Ascending
<b>Approximately how long do teachers stay with the school on average (years)?</b>	-0.13	0.4500		0.27	0.1087		Ascending
<b>Throughout the school year, what percentage of your work week, on average, do you spend on the following tasks in this school?</b>							
Internal administrative tasks, including human resource/ personnel issues, regulations, reports, school budget	-0.21	0.2480		-0.30	0.0772		Ascending
Observing teachers	0.09	0.6113		0.07	0.6988		Ascending

	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Coeffi cient</b>	<b>p- value</b>	<b>Sig</b>	<b>Response Type</b>
Working with instructional coaches, grade leaders, departmental leaders, or other instructional leaders in your school	0.04	0.8397		0.13	0.4558		Ascending
Developing or leading professional development activities for staff	-0.21	0.2522		-0.01	0.9429		Ascending
Student interactions, including discipline and academic guidance	0.38	0.0298	*	0.30	0.0799		Ascending
Student interactions, including discipline and academic guidance	-0.12	0.5016		0.05	0.7578		Ascending
Parent interactions	-0.06	0.7322		0.28	0.1083		Ascending
Other task not listed above, specify	-	-		-	-		Ascending
Other task not listed above, specify	-	-		-	-		Ascending
Other task not listed above, specify	-	-		-	-		Ascending
Other task not listed above, specify	-	-		-	-		Ascending
<b>Are student test score <u>growth</u> or student test-score <u>levels</u> included as a criterion in the evaluation of your performance?</b>							
Student test-score <u>growth</u> is included in my performance evaluation	0.21	0.2504		0.05	0.7813		Binary
Student test-score <u>levels</u> are included in my performance evaluation	0.10	0.5961		0.21	0.2281		Binary
<b>Is your compensation as leader of this school, including salary and bonuses, affected by any of the following...</b>							
Number of enrolled students	-0.07	0.7068		-0.06	0.7168		Binary
Students' achievement <u>growth</u> on standardized assessments (or the school's value added)	0.24	0.1752		0.22	0.2017		Binary



	Coeffi cient	p- value	Sig	Coeffi cient	p- value	Sig	Response Type
Students' test-score levels on state assessments	0.28	0.1194		0.45	0.0073	*	Binary
Student course completion rates	0.05	0.7751		0.25	0.1403		Binary
Reenrollment of current students across school years	0.18	0.3269		0.03	0.8699		Binary
Retention of teaching staff	-0.31	0.0748		-0.11	0.5334		Binary
School's operating profit or loss	0.23	0.1962		-0.17	0.3168		Binary
Other (specify)	-	-		-	-		Binary
<b>In the past 12 months, have you participated in the following kinds of professional development activities as the leader of this school?</b>							
University course(s) related to your role as leader of this school	-0.04	0.8437		-0.01	0.9463		Binary
Visits to other schools designed to improve your own work as leader of this school	0.35	0.0504	*	0.20	0.2577		Binary
Mentoring, peer observation, or coaching by or for a leader of another school	0.16	0.3757		-0.01	0.9470		Binary
Participating in a school leader network (e.g., a group of school leaders organized by an outside agency or through the internet)	0.20	0.2765		0.28	0.1054		Binary
Workshops, conferences, or training in which you were a presenter	0.17	0.3559		0.07	0.6936		Binary
Other workshops or conferences in which you were not a presenter	-0.31	0.0748		-0.11	0.5334		Binary
<b>Have you (the leader of this school) participated in a principal training program?</b>	0.12	0.5046		0.21	0.2385		Binary

	Coeffi cient	p- value	Sig	Coeffi cient	p- value	Sig	Response Type
<b>Prior to the 2013-2014 school year, how many years did you serve as the leader of <u>this</u> school</b>	0.08	0.6011		0.08	0.6060		Ascending
<b>Do you have prior experience as principal at another school?</b>	0.19	0.2275		-0.06	0.7222		Binary
<b>Was your previous experience at a conventional brick-and-mortar school, a virtual/online school or a combination of both?</b>							
Conventional brick-and-mortar	0.00	0.9824		0.07	0.5910		Binary
Virtual/on-line school	-0.22	0.0905		-0.20	0.1187		Binary
Both	-0.13	0.3209		-0.01	0.9522		Binary
<b>How long were you a principal at the previous school(s)?</b>	-0.15	0.5453		0.07	0.7665		Ascending
<b>Before you became a school leader, how many years of elementary or secondary teaching experience did you have, if any?</b>	-0.31	0.0808		-0.12	0.4954		Ascending
<b>How many years of teaching experience have you (the leader of this school) had in a <u>virtual/online</u> school?</b>	-0.18	0.3198		-0.11	0.5180		Ascending
<b>Is this school its own LEA (Local Education Agency)?</b>	-0.08	0.6279		0.02	0.8913		Binary
<b>A school's funding can be impacted by a number of factors. Is the school's funding impacted by the total number of courses <u>completed</u>?</b>	-0.13	0.4149		0.02	0.9204		Binary
<b>Does your school participate in the federal Title I program?</b>	-0.36	0.0394	*	0.03	0.8667		Binary

	Coeffi cient	p- value	Sig	Coeffi cient	p- value	Sig	Response Type
<b>Does your school receive designated funding for special education services?</b>	-0.03	0.8817		-0.21	0.2464		Binary
<b>Does your school’s authorizer monitor any of the following student outcomes in your school</b>							
State test results	-	-		-	-		Binary
Attendance rates	-0.23	0.1910		-0.05	0.7573		Binary
Re-enrollment rates	0.27	0.1272		0.15	0.4044		Binary
Course completion rates	-0.03	0.8825		0.25	0.1515		Binary
<b>Is your school affiliated with a school management organization that provides curriculum or instructional support services?</b>	0.30	0.0569		0.04	0.7785		Binary
<b>Does the management organization’s central office provide your school with any of the following?</b>							
Curriculum and Instructional Materials	0.53	0.0098	*	0.22	0.2909		Binary
Access to instructional coaches?	-0.10	0.6521		-0.08	0.7098		Binary
Professional development for teachers, such as workshops and in-service training programs?	-	-		-	-		Binary
A system of diagnostic or formative student assessments and results?	0.15	0.4919		-0.17	0.4215		Binary
Technical assistance, support, or resources in areas in which student test scores are weak?	0.15	0.4888		-0.02	0.9218		Binary
<b>In your opinion, do state or local laws or policies impose constraints on your school’s growth?</b>	-0.03	0.8695		-0.27	0.1156		Binary

## References

Betts, J. and Hill, P. et al. (2006). "Key Issues in Studying Charter Schools and Achievement: A Review and Suggestions for National Guidelines." National Charter School Research Project White Paper Series, No. 2.

Betts, J. and Tang, Y. (2011) "The Effect of Charter Schools on Student Achievement: A Meta-Analysis of the Literature." National Charter School Research Project.

Cremata, E., Davis, D., Dickey, K., Lawyer, K., Negassi, Y., Raymond, M., and Woodworth, J. (2013). National Charter School Study. Center for Research on Education Outcomes (CREDO) Report. Retrieved 10 July, 2015 from: <http://credo.stanford.edu/documents/NCSS%202013%20Final%20Draft.pdf>

Fortson, K., Gleason, P., Kopa, E., and Verbitsky-Savitz, N. (2015). "Horseshoes, hand grenades, and treatment effects? Reassessing whether nonexperimental estimators are biased." *Economics of Education Review* 44: 100-113.

Gill, B., Furgeson, J., Chiang, H., Teh, B., Haimson, J., and Verbitsky-Savitz, N. "Replicating Experimental Impact Estimates in the Context of Control-Group Noncompliance." *Statistics and Public Policy*, forthcoming.

Hanushek, E. A., Kain, J. F., & Rivkin, S. G. (2004). Disruption versus Tiebout improvement: The costs and benefits of switching schools. *Journal of Public Economics*, 88(9), 1721-1746. Retrieved 10 July, 2015 from: <http://www.sciencedirect.com/science/article/pii/S004727270300063X>

Hanushek, E.A., Peterson, P.E., and Woessmann, L. (2012). Is the US Catching Up? International and State Trends in Student Achievement. *Education Next*, Vol. 12, No. 4. Fall 2012. Retrieved 10 July, 2015 from: <http://educationnext.org/is-the-us-catching-up/>

Pazhouh, R., Lake, R., and Miller, L. (2015). "The Policy Framework for Online Charter Schools." Center on Reinventing Public Education, University of Washington Bothell, 2015.

Raymond, M. (2009). Multiple choice: Charter school performance in 16 states. Center for Research on Education Outcomes (CREDO) Report. Retrieved 10 July, 2015 from: [http://credo.stanford.edu/reports/MULTIPLE\\_CHOICE\\_CREDO.pdf](http://credo.stanford.edu/reports/MULTIPLE_CHOICE_CREDO.pdf)

South, S. J., Haynie, D. L., & Bose, S. (2007). Student mobility and school dropout. *Social Science Research*, 36(1), 68-94. Retrieved 10 July, 2015 from: <http://www.sciencedirect.com/science/article/pii/S0049089X05000700>

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR  
 14 THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**  
 16 Plaintiffs,  
 17 v.  
 18 **GAVIN NEWSOM, et al.**  
 19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)  
**DECLARATION OF GEENA  
 BURGESS IN SUPPORT OF  
 MOTION FOR PRELIMINARY  
 INJUNCTION**  
 Judge: Hon. Dean D. Pregerson

20 **DECLARATION OF GEENA BURGESS**

21 I, Geena Burgess, declare as follows:

22 1. My name is Geena Burgess. I am a Seventh Grade English Language Arts  
 23 (“ELA”) teacher at Inland Leaders Charter School (“Inland Leaders”). I have personal  
 24 knowledge of the facts stated in this Declaration and, if called as a witness, I could and  
 25 would testify competently to each fact.

26 2. I graduated from California Baptist University in Riverside, CA in 2003  
 27 with a Bachelor’s degree in English and Human Development and earned my teaching  
 28

1 credential in 2012. I have completed 7 years of teaching 7<sup>th</sup> grade students after an  
2 additional 6 years working in various support capacities in the classroom.

3         3. Inland Leaders is a highly successful brick and mortar independent charter  
4 school program in Yucaipa, California, serving more than a thousand students in  
5 Transitional Kindergarten through Eighth Grade every year. During the summer of  
6 2020, the administration of Inland Leaders surveyed teachers and parents multiple times  
7 and spent a great deal of time deliberating, weighing options, crunching numbers,  
8 collaborating, and innovating. Inland Leaders had resolved to allow our students the  
9 three options of returning to class in person, learning remotely, or a hybrid of on and  
10 off-site learning. Less than 10% of my students elected hybrid or remote learning for  
11 this upcoming year, with over 90% of my students electing in person instruction.

12         4. I was excited to get back in my classroom and our families were excited to  
13 return to our beloved school campus. The Governor's closure of in-person schools will  
14 cause a significant disadvantage to our students, teachers, families, and communities.

15         5. Getting to know my students is the most important part of each new school  
16 year. My teaching philosophy is centered on the proven concepts of relationship and  
17 connection. In my classroom, I spend as much effort helping my students understand  
18 why they want to learn the 7th grade ELA standards as I do helping them master them  
19 because student buy-in is the key to authentic learning. I get to know my students and  
20 learn what their passions, troubles, strengths, and trepidations are. I know how to  
21 weave the interests of a distracted student into a discussion on the fly to regain their  
22 attention and show them I'm aware of them, know them, and care about them. I engage  
23 my students in the material and they learn because they want to. They learn my 7th  
24 grade ELA standards because they conclude that they want to be able to share their  
25 thoughts and ideas as well as the accomplished authors we enjoy reading in our class.  
26 Because I get to know them, I can help them see that they too have a story to tell and a  
27 message to share with the world and that the concepts that I teach in my class are meant  
28 to help them do that in an impactful way.

1           6.     As I get to know my students in the classroom, I pay close attention to  
2 their energy. Many of my students come into class with burdens and anxiety causing  
3 stressors. I work hard to help them unburden themselves a bit while at school. I learn  
4 which student needs eye contact and a smile to help them stay on-task and which  
5 student needs me to come to sit near them for a bit. I know who needs a few moments  
6 to connect and chat about their cat before they can work effectively and which students  
7 really just need me to explain the concept, my expectations, and give them time and  
8 space to try it themselves.

9           7.     This past spring, as Inland Leaders immediately implemented remote  
10 instruction (we did not miss a single instructional day), I lost this crucial connection  
11 with many of my students. I was devastated.

12           8.     Only about thirty percent (30%) of my students consistently showed up to  
13 attend our live zoom lesson and discussions. As impressive as the technology is, it was  
14 a struggle to engage and interact with the students over Zoom. A couple of students  
15 refused to speak or show their faces and a few would do one but not the other.  
16 Knowing my students the way I did, I understood their choices and would encourage  
17 them but not push them. I encouraged my students to attend live meetings, offering  
18 raffles for gift cards at my own expense and always tried to give them some time for  
19 much needed social interactions.

20           9.     About twenty percent (20%) of my students were so driven and  
21 independent that they were requesting my videos and assignments ahead of schedule  
22 and were motivated to get their work and lessons finished as quickly as possible, on  
23 their own, without attending the valuable and enriching discussions. I knew these kids  
24 well and wanted so badly to challenge them to share their ideas in the discussion and to  
25 listen and respond to the thoughts and ideas of others the way we would have in class.  
26 My driven, determined, focused students often need this kind of class time to help them  
27 develop social leadership and effective communication skills. They were not getting  
28 this with distance learning.

1           10. About forty-five percent (45%), were hit-or-miss with work and meeting  
2 attendance. I had a very gracious late work policy, partially because of the statewide  
3 policy that students' grades could increase but not decrease during distance learning,  
4 but mainly because of the extraordinary and often traumatic circumstances these kids  
5 were now dealing with. Many of the students that I contacted about their missing  
6 assignments expressed feelings of loneliness, depression, and anxiety and shared that  
7 they had just procrastinated and fell too far behind to feel like they could catch up.  
8 Most of the students in this group had no parent in the home during the day. I worked  
9 many long hours trying to help students organize themselves, set goals, strategize,  
10 empathize, and problem solve, but these tasks are made significantly more difficult  
11 without in person contact. Despite my best efforts, many students turned in half-  
12 hearted work, plagiarized work, or no work in the end. I firmly believe these students  
13 would have performed exponentially better and learned significantly more in my  
14 classroom with in person instruction than they did with distance learning.

15           11. About six percent (6%) of my students disappeared from my sphere of  
16 influence entirely. I reached out to all of my students and parents and tried to help  
17 motivate them. Most said they would start attending but never did. Our administration  
18 conducted welfare checks. Inland Leaders supplied Wifi and Chromebooks and still  
19 could not engage these students at all.

20           12. I consider the 2020 distance learning quarter to be failure. Because of the  
21 significant challenges, I was unable to cover all of the standards I usually do. Looking  
22 back, I cannot identify any additional steps that I could have taken to be more effective  
23 with keeping the crucial connection and relationship with my students using online  
24 learning. I often worked 15 hour days to create new engaging lessons and materials,  
25 track my students down when they failed to attend class, and work one-on-one with  
26 them over zoom, phone, and by text. I mailed cards and bought gift cards to motivate  
27 my students, and I would stay on zoom after class to just talk to students because they  
28



1 were lonely. Although I did my best in unprecedented circumstances, I failed. I am  
2 heartbroken over it.

3 13. If I am required to continue distance learning in Fall 2020, I will have an  
4 even more difficult time creating the connection and relationship that is crucial to  
5 effective teaching. I expect that my students' education and experience will continue to  
6 be detrimentally impacted by distance learning in Fall 2020.

7 14. I know that there are many teachers like me, working at innovative and  
8 determined schools like mine. Inland Leaders works to serve students and prove its  
9 value in our community every day. My school, our staff, and our families recognize the  
10 importance of in-class learning for the vast majority of our students and we all just want  
11 the opportunity to serve our community the best way we know.

12  
13 I declare under penalty of perjury under the laws of the United States of America  
14 that the foregoing is true and correct.

15 Executed on this 27th day of July 2020, at Yucaipa, California.

16  
17 DocuSigned by:  
18 *Geena Burgess*  
19 Geena Burgess

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
**THE CENTRAL DISTRICT OF CALIFORNIA**

14 **MATTHEW BRACH, et al.**  
 15  
 16 Plaintiffs,  
 17 v.  
 18 **GAVIN NEWSOM, et al.**  
 19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)  
**DECLARATION OF COLLEEN M. CUNNINGHAM IN SUPPORT OF MOTION FOR PRELIMINARY INJUNCTION**  
 Judge: Hon. Dean D. Pregerson

20  
21  
22 **I, Colleen M. Cunningham, declare as follows:**

23 1. I am a teacher of English Literature at Polytechnic High School in  
24 Riverside, California (“Poly HS”). I have personal knowledge of the facts stated in this  
25 Declaration and, if called as a witness, I could and would testify competently to each  
26 fact.

27 2. I received a BA in English Literature and a Single Subject Teaching  
28 Credential in 1995 and a MA in Education/Curriculum Leadership in 1997, both from



1 University of Redlands in Redlands, CA. In 2018, I completed the coursework to  
2 obtain a Preliminary Administrative Services credential through the Association of  
3 California School Educators. I have a certificate in Teaching Advanced Placement  
4 from UC Riverside, where I also completed coursework in College Admissions  
5 Counseling. I have completed additional post-graduate coursework at Harvard  
6 Graduate School of Education, University of San Diego, and UC San Diego. I have  
7 been a high school teacher for 25 years, the past 20 of which I have taught English,  
8 ELD, and AVID at Polytechnic High School in Riverside, CA. I have served as an  
9 International Staff Developer for AVID Center. I was selected as High School Teacher  
10 of the Year for Riverside Unified School District in 2016.

11 3. I taught English from March 13, 2020 through the end of the school year  
12 on May 22, 2020 at Poly HS using a distance learning model. I taught 5 English  
13 classes, with approximately 33 students in each class for a total of 165 students.

14 4. I observed significant detrimental impact on my students from the closure  
15 of physical schools and transition to distance learning.

16 5. First, the student participation rate in my online classes was extremely low.  
17 At the beginning of distance learning in March, I had 42% participation by my students;  
18 by the end, I had 4 total students participate, or 2%. Many of my students lacked  
19 sufficient access to wifi and computers to be able to participate in distance learning.  
20 Although the district offered to loan devices to students who needed them, the offer and  
21 sign-up form came via email, to which many students, especially students in low  
22 income families, lacked access. Several of my students who were actively trying to  
23 obtain devices were never able to obtain them. Many other students did not attempt to  
24 obtain the devices they needed to participate in classes. I believe that my experience is  
25 typical of other high school teachers in Riverside and California. I anticipate similar  
26 low participation rate by my students if we return to distance learning in the fall.  
27 Students simply cannot learn if they do not or cannot attend classes.

28

1           6.       Second, the connection and relationship between myself and my students  
2 was detrimentally impacted. Teaching requires a relationship of trust and respect  
3 between the students and the teacher, which I strive to create every day in my classes. I  
4 found it incredibly difficult to continue the relationships I had already developed via  
5 distance learning, when at best I could see a video of my student's face – nearly all non-  
6 verbal communication was cut off. As a result, my students were much less likely to  
7 ask questions, participate in class, and simply were less likely to learn. Moreover,  
8 students who did participate in distance learning were often ashamed or afraid to turn  
9 on their cameras as they did not want their teachers and classmates to see where they  
10 lived. In those cases, I had literally almost no way to foster the connection and  
11 relationship necessary for effective teaching. This lack of connection and relationship  
12 will be significantly worse at the beginning of the school year, when I am attempting to  
13 form a new relationship and connection with students I have never met.

14           7.       Third, distance learning places significant additional burdens on students  
15 and their parents to manage their schedule, perform work independently that would  
16 otherwise be performed in class, and pay attention to the class. I spend a significant  
17 amount of time in any high school class making sure that the right students are in the  
18 right classroom and that they are doing their work instead of falling prey to distractions  
19 such as their phones or devices. These functions are essential to students learning. It is  
20 impossible for me to perform these functions online. In my experience, students have  
21 significant additional distractions at home – from video games to chores to caring for  
22 younger siblings or family members – that make it extremely difficult for students to  
23 learn online.

24           8.       Fourth, I observed a significant detrimental impact on my students'  
25 emotional health, which made it hard for those students to learn. Many of my students  
26 expressed to me a marked increase in feelings of depression, isolation, and anxiety.  
27 Two students were so impacted by the school closures, they were having difficulty  
28 getting out of bed in the morning. Those are the students who responded to me. I don't

1 know how many students were also suffering but did not reach out for help. The only  
2 assistance we could offer was a phone consultation with a school counselor. Students  
3 were cut off from speech therapy, tutoring services, language support, mental health  
4 counseling, and other services provided by the school system. The students most  
5 greatly impacted by the shutdown were not the middle and upper class students, but the  
6 lower income and minority students who already suffer from an ever-widening  
7 achievement gap. I expect these problems to continue and worsen if we continue to  
8 utilize only distance learning.

9       9. In addition, teachers have not been well equipped to make distance  
10 learning effective.

11       10. In March, when the announcement came that schools would remain closed  
12 for the duration of the school year, I was given limited guidance and sample lessons; the  
13 only training I received was directly related to distance learning technology, not  
14 methodologies or best practices. I believe that my experience was typical of other high  
15 school teachers in Riverside and California.

16       11. I am now two weeks from starting the 2020-2021 school year online, and  
17 teachers in my district are only now being offered limited, optional, online professional  
18 development to support our work in distance learning. This support consists primarily  
19 of training in the use of various platforms, not models for successful student  
20 engagement. Despite my desire to provide a rigorous education for my students this  
21 year, I am unprepared to meet the demands. Students in our district have been told they  
22 will not be able to pick up textbooks or necessary devices until after the start of the  
23 school year. Students will be required to participate in synchronous digital learning, but  
24 have not been taught how to effectively utilize the tools or manage their learning  
25 environment to fully benefit from whatever material is presented during that time. I  
26 have no training in best practices for engaging students – especially students I have  
27 never met – through a digital platform. John Hattie, through his work in Visible  
28 Learning, identifies Collective Teacher Efficacy as the most powerful factor in

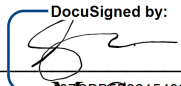
1 advancing student achievement. He defines this as “the collective belief of the staff of  
2 the school/facility in their ability to positively affect students.” ([https://visible-  
3 learning.org/2018/03/collective-teacher-efficacy-hattie/](https://visible-learning.org/2018/03/collective-teacher-efficacy-hattie/)).

4 12. In my experience, teachers do not believe they have the ability to affect  
5 student learning through an online only model to anywhere near the degree needed.  
6 The longer the school closures persist, the more dramatic the impact on student learning  
7 will be.

8 13. Under these circumstances, I believe that my students will suffer at least  
9 the same problems with distance learning and detrimental impact on their education as  
10 they experienced in Spring 2020.

11  
12 I declare under penalty of perjury under the laws of the United States of America  
13 and the State of California that the foregoing is true and correct.

14  
15 Dated: July 26, 2020

16  
17   
18 Colleen M. Cunningham  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28



1 HARMEET K. DHILLON (SBN: 207873)  
2 harmeet@dhillonlaw.com  
3 MARK P. MEUSER (SBN: 231335)  
4 mmeuser@dhillonlaw.com  
5 GREGORY R. MICHAEL (SBN: 306814)  
6 gmichael@dhillonlaw.com  
7 DHILLON LAW GROUP INC.  
8 177 Post Street, Suite 700  
9 San Francisco, California 94108  
10 Telephone: (415) 433-1700  
11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR  
14 THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

**DECLARATION OF FR. DAMIEN  
GIAP IN SUPPORT OF MOTION  
FOR PRELIMINARY INJUNCTION**

Judge: Hon. Dean D. Pregerson

20  
21 I FR. DAMIEN GIAP, declare as follows:

22 1. I am a citizen of the United States. I have personal knowledge of the facts  
23 set forth in this declaration. If called as a witness, I would testify competently to the  
24 matters set forth herein.

25 2. I am the school chaplain at St. John the Baptist School in Costa Mesa. I  
26 graduated from UC Irvine, where I majored in biology. I obtained my master's degree  
27 from the University of St. Thomas in Rome, Italy. I have five years of teaching  
28 experience: from 2007-12, I taught religion at JSerra Catholic High School in San Juan



1 Capistrano. I have thirteen years of experience working in Catholic education as a  
2 chaplain for St. Anne School in Laguna Niguel and also as a chaplain at JSerra, from  
3 2007-18. I'm also in administration at St. John the Baptist School in Costa Mesa. I  
4 have extensive experience working in the Diocese of Orange; the entirety of my  
5 priesthood thus far (13 years) has been in private Catholic education.

6 3. I firmly believe that the Governor's mandate will harm children, because it  
7 will deny them the necessary social interactions they require in order to develop  
8 emotionally, psychologically and spiritually. This kind of interaction is instrumental  
9 for one's social, emotional and cognitive formation. Furthermore, I don't believe that  
10 online learning should be imposed on every family, especially if intelligent and  
11 discerning parents have elected to send their children back to an in-person teaching  
12 model.

13 4. One's character is formed by interacting with others. Forcing children to  
14 learn online and sending them home deprives them of the opportunities and necessary  
15 interactions to form this character. For a child, I don't think virtues are acquired by  
16 sitting in front of a computer screen. I strongly believe that the Governor's order does  
17 not address any of these scenarios.

18 5. The reopening of schools must occur to foster and allow for social  
19 interaction between children and not deprive them of these necessary interactions. Such  
20 interaction is vital for a child's social, psychological and spiritual development.  
21 Requiring schools to be closed will only further harm children and deny children the  
22 necessary interactions for proper development.

23  
24 I declare under the penalty of perjury under the laws of the United States of  
25 America and the State of California that the foregoing is true and correct.

26  
27 Dated: July 25, 2020



28 Fr. Damien Giap



1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
**THE CENTRAL DISTRICT OF CALIFORNIA**

14 **MATTHEW BRACH, et al.**

15 Plaintiffs,  
16 v.

17 **GAVIN NEWSOM, et al.**

18 Defendants.  
19

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF MICHELLE**  
**GERST IN SUPPORT OF MOTION**  
**FOR PRELIMINARY INJUNCTION**

Judge: Hon. Dean D. Pregerson

21 **I, MICHELLE GERST, declare as follows:**

22 1. I am a citizen of the United States and a resident of Riverside county. I  
 23 have personal knowledge of the facts set forth in this declaration. If called as a witness,  
 24 I could and would testify competently to the matters set forth herein.  
 25

26 2. I am a substitute teacher for grades K-12 who has been working in  
 27 education for the past four years. I have worked in both socioeconomically advantaged  
 28



1 and disadvantaged school districts. I have completed all the state teaching exams for  
2 the State of California, and I will complete my master's in education in October 2020.

3         3. As a teacher, we are heavily dependent on differentiation in education. We  
4 focus on choice, collaboration, communication, critical thinking, and creativity. We are  
5 student-focused, not teacher-focused; we are taught to put the children's needs before  
6 our own and their learning needs are our top priority. Teachers no longer impose their  
7 specific learning techniques on children or tell them how they "must" learn; rather,  
8 teachers take an individualistic approach because all students learn differently. Because  
9 of this, education can never be a "one-size-fits-all" approach.

10         4. I am deeply concerned about what I am witnessing in our schools. On  
11 March 13, 2020, I was in a disadvantaged high school and saw students who were  
12 visibly upset when they learned that they would not be in school for a month due to the  
13 lockdown. The students had various extracurricular activities scheduled that they  
14 worked hard for and were excited about, yet they were now being taken from them. For  
15 example, a dance team fundraised all year after earning a spot to dance at Disneyland  
16 and for most of these students, it was a once in a lifetime opportunity that they earned.  
17 For children who grow up in troubled neighborhoods and low-income communities, the  
18 school offers them hope and opportunity for a better future.

19         5. Toward the end of March parents in the more social advantaged school  
20 districts began to approach me to tutor their children. The parents were financially able  
21 to pay for a tutor. These children I worked with are intelligent and rank toward the top  
22 of their class. However, they struggled with online learning at home. Their morale was  
23 down they missed the important social interactions with their friends.

24         6. My role as a tutor is to help students stay focused, work with them as if we  
25 are in the classroom, offer structure to them, and ensure their engagement and  
26 interaction. All of this cannot be done as well through distance learning. Ordinarily, as  
27 I would sit with the students during in-person tutoring lessons, they would become  
28 distracted by video games. If I was not there to supervise, the students would have

1 engaged in other activities, rather than completing their schoolwork. The students I  
2 helped brought their grades up and finished with A's in all of their classes.  
3 Unfortunately, without that same level of supervision, as is the case with distance  
4 learning, I expect that these distractions will detract from the students' abilities to learn.

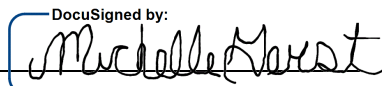
5 7. As a result of the recent shut down of schools, I have numerous parents  
6 reaching out to me, seeking a tutor for their child. Most are from socioeconomically  
7 advantaged schools in grades K-12. The parents are all stressed, concerned, confused,  
8 and frustrated, as they work and some have multiple children in different grades. The  
9 parents I am assisting work from home, but they cannot sit down with their kids and  
10 work simultaneously. Some parents are forming groups to gather at one parent's home  
11 so that all the children can be tutored at once. My tutoring provides these parents some  
12 relief; however, not every parent can afford to pay for a tutor such as myself.

13 8. When I see the children struggling with distant learning, even though they  
14 come from a more affluent household, I can only assume that those children in  
15 disadvantage, low-income households are sinking without a life raft.

16 9. The one-size-fits-all approach employed by the State of California is  
17 harming children and taking away their right to a proper education. The underserved,  
18 low-income households bear the brunt of these negative consequences. The reopening  
19 of schools is necessary to ensure that every child, no matter how poor or disadvantaged,  
20 receives the proper education that they are entitled to under California law.

21  
22 I declare under penalty of perjury under the laws of the United States of America  
23 and the State of California that the foregoing is true and correct.

24 Dated: July 26, 2020

25   
26 Michelle Gerst  
27 0672B374F0F5486...

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
**THE CENTRAL DISTRICT OF CALIFORNIA**

14 **MATTHEW BRACH, et al.**

15 Plaintiffs,  
16 v.

17 **GAVIN NEWSOM, et al.**

18 Defendants.  
19

Case No.: 2:20-cv-06472 DDP (AFMx)

**DECLARATION OF RACHELLE**  
**GOLDEN IN SUPPORT OF**  
**MOTION FOR PRELIMINARY**  
**INJUNCTION**

Judge: Hon. Dean D. Pregerson

20  
21 **I, RACHELLE TAYLOR GOLDEN, declare as follows:**

22 1. I am an attorney licensed to practice law in the State of California and all  
 23 Districts Courts within California. I am also licensed to practice law in the District of  
 24 Columbia, Washington. I am a mother of two amazing step children, and am also Court  
 25 Appointed Special Advocate (“CASA”) in which I have been appointed by Fresno  
 26 Superior Court to represent the best interests of a child in the foster care system. The  
 27 following facts are personally known to me and if called, I would and could competently  
 28 testify.



1           2.     My responsibilities as a CASA are that I appear on behalf of the child so  
2 that I can ensure that the voice of the child is heard in the judicial system as it relates to  
3 whether they should or should not be reunited with their biological parent(s), or whether  
4 they should or should not continue being placed within the foster care system, or with a  
5 certain foster care parent(s). As a CASA, I am essentially the liaison between the court  
6 system, the social worker, the probation officer (if there is one), the foster parent(s), the  
7 biological parent(s), attorney, and the teacher. (Collectively referred to herein as “Team  
8 Members.”) Coordinating all of these key Team Members is critical to ensure that the  
9 child does not slip through the cracks of the system.

10           3.     I am also responsible to ensure that the foster child obtains appropriate  
11 medical care, housing, and education. As foster children can be placed in many different  
12 homes, it is my responsibility to ensure that there is no interruption in the continuity of  
13 that child’s physical, emotional, and educational needs. I am responsible to ensure that  
14 cohesive information, as obtained from all of the child’s Team Members, are correctly  
15 conveyed to the court system so that the court can ensure that the child’s needs are met.

16           4.     From my experience, I understand that the foster care system is  
17 overburdened and often times a foster child will primarily rely on their social worker  
18 assigned to their case in order to obtain proper services for that child. While social  
19 workers play an incredible role in the child’s life, they typically are overburdened with  
20 case loads and are unable to ensure that the basic needs of the child are met as they do  
21 not have the time to investigate the child’s circumstances to help define the child’s best  
22 interests. That social worker does not have the time to ensure that the child receives  
23 proper education, and certainly cannot ensure that the child is engaging in a remote  
24 learning environment from their home or foster placement. Children within the foster  
25 care system are quite literally left behind.

26           5.     At school, the environment for these children are stable, the children are  
27 nourished with food by the school often several times per day, the children obtain  
28 physical exercise, and most importantly the children are with safe adults. Furthermore,

1 many foster children have an Individualized Educational Program (“IEP”) as a result of  
2 issues developed in utero and/or early childhood due to the parent(s) substance abuse,  
3 physical, emotional and/or sexual abuse they’ve endured. In order to maintain success  
4 in their education, these children must have hands-on, in-person instruction. Without  
5 participating in a hands-on environment at school, there is no way to ensure that these  
6 children with an IEP are able to obtain any education whatsoever.

7 6. Often times a child within the foster system experiences or has experienced  
8 abuse, whether it be emotional, physical or sexual, which can cause the child to run away  
9 from their environment, and essentially leaves them homeless. That child’s school is the  
10 only safe place that the child can go to receive basic care.

11 7. I am aware that some of my fellow CASA advocates who are employed by  
12 the education system are concerned for these children because teachers are often the first  
13 line of defense in reporting abuse that they observe by being around the children on a  
14 daily basis. Without the physical presence of a teacher, who knows, sees that child on a  
15 daily basis, and cares for that child, the children are unable to be adequately protected  
16 from domestic abuse because the teacher is unable to see the signs of abuse via Zoom,  
17 that is if the child even has been attending the remote teaching sessions. Schools are an  
18 essential element for these children to be safe from their incredibly difficult  
19 circumstances. Without school re-opening, these children who are already so far behind  
20 in life, will further be held back from becoming educated, contributing adults to our  
21 society. Physical attendance in the classroom is the only way to ensure that these  
22 precious children can have a chance to succeed.

23 I declare under penalty of perjury of the laws of the State of California and the  
24 United States, the foregoing is true and correct.

25 Executed on July 26, 2020

26 By:  \_\_\_\_\_  
27 RACHELLE TAYLOR GOLDEN  
28



1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

**DECLARATION OF MATTHEW  
 BRACH IN SUPPORT OF  
 MOTION FOR PRELIMINARY  
 INJUNCTION**

Judge: Hon. Dean D. Pregerson

20  
21  
22 I, Matthew Brach, declare:

23 1. I am a resident of Rancho Palos Verdes, Los Angeles County, California. I  
24 am bringing suit individually.

25 2. By way of background, I am a Governing Board Member of Palos Verdes  
26 Unified School District.

27 3. I want the schools in Palos Verdes Unified School District to physically  
28 open for the 2020-2021 school year.





1 4. Palos Verdes Unified School District has 10 Elementary Schools, 3  
2 Intermediate Schools, 2 Traditional High Schools, and 1 Alternative High School.

3 5. There are approximately 11,000 students in the Palos Verdes Unified  
4 School District.

5 6. I am a father and have two children, a daughter aged 13 and a son aged 16.

6 7. My daughter is entering 8<sup>th</sup> grade at Palos Verdes Intermediate School and  
7 I have witnessed that her isolation from school is creating mental health issues, as she is  
8 struggling to identify with “what is normal.” I have witnessed her fears and  
9 compulsions since schools were closed in March.

10 8. My son will be a senior and I have witnessed that he is extremely  
11 adversely impacted by the lack of social interaction, and lack of positive teacher role  
12 models. He is a student that benefits from discussion and interaction with peers and  
13 teachers. Without the ability to return to class, I worry that he will become more  
14 detached from school, and his academic future will suffer.

15 9. As a Governing Board Member of Palos Verdes Unified School District, I  
16 have firsthand knowledge of the steps that our district has taken to be able to safely  
17 reopen our sixteen schools for the upcoming 2020-2021 school year.

18 10. Palos Verde Unified School District has established Reopening  
19 Committees, comprised of 40 Staff Members, 45 Medical Professional members, 30  
20 Elementary Parents, and 39 High School Parents.

21 11. Smaller subcommittees were also established to address the specific needs  
22 of Special Education Students.

23 12. Palos Verde Unified School District has also purchased and implemented a  
24 personal protective equipment (PPE) and Mitigation Strategy, which includes: (1)  
25 Staggered arrival time; (2) Designated entrance and exit routes; (3) No Touch  
26 Thermometers; (4) Requiring masks/face shields for teachers and students like N95,  
27 cloth, and disposable masks; (5) Individual water filling stations and discontinuing  
28 communal drinking fountains; (6) a Lunchtime grab/go model; (7) Plexiglass serving



1 and cashier stations; (8) Investigation of HVAC system to support air circulation if  
2 windows are closed and HEPA filters; (9) Increased signage (one-way hallways,  
3 direction guides, handwashing reminders, etc.); (10) Handwashing stations with foot  
4 pedal; (11) Touch-free sanitizing; and (12) Specialized protocol for high touch areas.

5 13. A survey was conducted recently and an overwhelming amount (65%) of  
6 parents in my district supported returning the students to school, for in-person learning.

7 14. Parents have also reported challenges with the emergency distance learning  
8 such as: (1) keeping children engaged in learning virtually; (2) parent challenges with  
9 having to work from home and also supervising children; (3) communicating with the  
10 classroom teacher; (4) supporting their child with academic needs; (4) struggling with  
11 their child's emotional health; and (5) establishing a home learning space.

12 15. Over 60% of parents also reported that the amount of "face-to-face"  
13 teaching was "not enough."

14 16. To be clear, our school district has purchased and will abide by all  
15 restrictions imposed by Governor Newsom in his July 17, 2020 framework for  
16 reopening California schools, but I also share many concerns about the reopening  
17 restrictions as our superintendent, Alex Cherniss, Ed.D., recently outlined in a letter he  
18 co-signed to Governor Newsom and President Donald Trump.

19 17. I agree with Superintendent Cherniss that we need to have operational  
20 "procedures in place that allow for flexibility in reopening our schools safely and with a  
21 healthy dose of common sense."

22 18. I also share the concerns of Superintendent Cherniss, along with ten other  
23 superintendents across the state of California, that the state is "now projecting a \$54  
24 billion dollar deficit, much of our citizenry is out of work, and many school districts are  
25 preparing for massive certificated and classified layoffs and budget reductions. School  
26 districts are also experiencing major student mental health issues as well as learning  
27 loss, despite the efforts of our teachers, staff, students and parents."

28 19. Our schools need to reopen physically, which can certainly be done safely.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct and is executed this 27<sup>th</sup> day of July 2020, at Los Angeles County, California.

DocuSigned by:  
*Matthew Brach*  
Matthew Brach

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
**THE CENTRAL DISTRICT OF CALIFORNIA**

14 **MATTHEW BRACH, et al.**

15 Plaintiffs,  
16 v.

17 **GAVIN NEWSOM, et al.**

18 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

19 **DECLARATION OF JESSE**  
**PETRILLA IN SUPPORT OF**  
**MOTION FOR PRELIMINARY**  
**INJUNCTION**

Judge: Hon. Dean D. Pregerson

20 I, Jesse Petrilla, declare:

- 21 1. I am a resident of Mission Viejo, Orange County, California.
- 22 2. I am the father of a young boy, who is set to start 1<sup>st</sup> grade for the 2020-
- 23 2021 school year.
- 24 3. My son was in Kindergarten for the 2019-2020 school year, which was
- 25 moved to a distance learning model for several months due to the statewide shutdown
- 26 order.
- 27
- 28



1 4. As a young child, he is entering into critical stages of development, where  
2 it is essential to meet certain learning goals- I was amazed how much he was learning  
3 by being in his class at school, in-person.

4 5. I strongly believe that being in school is an important socialization  
5 component of life and when my son was in regular school, I noticed a significant  
6 improvement in his discipline.

7 6. As distance learning in the spring of 2020 dragged on, he began to exhibit  
8 restlessness and behavioral issues.

9 7. I also noticed his enthusiasm for learning had rapidly declined, which was  
10 very different than before.

11 8. After the schools shut down, my wife took time off of work to help my son  
12 with school - since he is so young, of course he cannot participate in distance learning  
13 by himself.

14 9. My wife and I were looking forward to my wife being able to return to  
15 work, as this has an impact financially on our family.

16 10. I have investigated private schools, but I was quoted approximately  
17 \$10,000 per year. This cost is in addition to daycare expenses for our other, younger  
18 child.

19 11. I am very worried about the lifelong negative effect that the shut down and  
20 distance learning will have on my young child, as he is not able to be exposed to the  
21 social aspects of school and the structured education that is so needed at a tender age.

22 I declare under penalty of perjury under the laws of the United States of America  
23 that the foregoing is true and correct and is executed this 28<sup>th</sup> day of July 2020, at  
24 Orange County, California.

25 DocuSigned by:

26 *Jesse Petrilla*  
27 \_\_\_\_\_  
28 Jesse Petrilla

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
**THE CENTRAL DISTRICT OF CALIFORNIA**

14 **MATTHEW BRACH, et al.**  
 15  
 16 Plaintiffs,  
 17 v.  
 18 **GAVIN NEWSOM, et al.**  
 19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

**DECLARATION OF LACEE  
 BEAULIEU IN SUPPORT OF  
 MOTION FOR PRELIMINARY  
 INJUNCTION**

Judge: Hon. Dean D. Pregerson

20  
21  
22 I, Lacey Beaulieu, declare:

- 23 1. I am a resident of La Jolla, San Diego County, California.
- 24 2. I have two children, a teenage girl and a ten-year old boy.
- 25 3. My daughter will be entering 9<sup>th</sup> grade at a private school, and my son will
- 26 be entering 5<sup>th</sup> grade in the San Diego Unified School District.
- 27 4. Distance learning has been challenging - my son was only provided with a
- 28 weekly written schedule that he was expected to follow, along with various websites



1 and passwords to log in.

2 5. It is unrealistic to expect a ten-year old to follow a daily/weekly schedule  
3 on his own.

4 6. I run my own business, and I was constantly having to monitor what he  
5 was doing time-wise, telling him when to switch from one subject to the next, and then,  
6 after his lessons were done, I would have to explain every online lesson with him. If I  
7 was tied up with work, he was unable to proceed with his lesson plans since I had to  
8 assist him all the time.

9 7. My son received far less instruction from his teachers during distance  
10 learning, which was done via Zoom. He received 90 minutes per week from his primary  
11 teacher, 30 minutes per week from his Spanish teacher, 30 minutes per week from his  
12 PE teacher, and 30 minutes per week from an enrichment program (which was an extra  
13 program that I paid for).

14 8. It is extremely concerning that my son received no Zoom instruction at all  
15 from his math teacher the entire time that the school was closed.

16 9. In contrast, my daughter, through her private school, received much more  
17 interaction from her teachers via Zoom.

18 10. However, even though my daughter received more instruction via Zoom,  
19 she still had difficulty turning in assignments on time.

20 11. My daughter also had difficulty with the lack of one-on-one, face-to-face  
21 interaction with her teachers. This type of individualized and personal attention was one  
22 reason I chose to send her to private school.

23 12. As a parent, I am also aware of the numerous studies done and medical  
24 advice that children and teens should limit time on electronic devices.

25 13. Doctors recommend not spending more than 2 hours a day on devices, and  
26 due to distance learning, my children were spending much more time on their devices  
27 than this, since instruction was online, but also assignments and homework.

28 14. Due to being on devices too much, I am concerned about my children's

1 brain development and long-term effects of so much screen time.

2 15. I have noticed a difference in my children since the schools have switched  
3 to distance learning – they are both depressed, sleep schedules are difficult to manage,  
4 and their discipline in completing school assignments has decreased.

5 16. I also see how my children are suffering as they continue to be deprived of  
6 personal contact with their peers, which is so important for social skills and  
7 development, and which helps prepare them for their future.

8 I declare under penalty of perjury under the laws of the United States of America  
9 that the foregoing is true and correct and is executed this 28<sup>th</sup> day of July 2020, at San  
10 Diego County, California.

11 DocuSigned by:

12 *Lacey Beaulieu*

13 Lacey Beaulieu  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

**DECLARATION OF ERICA**  
**SEPHTON IN SUPPORT OF**  
**MOTION FOR PRELIMINARY**  
**INJUNCTION**

Judge: Hon. Dean D. Pregerson

20  
21 I, Erica Sephton, declare:

- 22 1. I am a resident of Murrieta, Riverside County, California.
- 23 2. I have two children, and one of my children (4½ years old) was set to
- 24 attend transitional kindergarten this Fall (Fall of 2020) at a private school.
- 25 3. I also have a toddler to take care of, and I know that I cannot properly
- 26 provide the proper educational setting and attention for my 4 ½ year old, since I must
- 27 also attend to my toddler.
- 28





1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

4. I know my daughter wants to be in school and being present in a physical school setting is best.

5. Due to her young age, the distance learning mode is really no education at all.

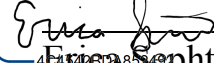
6. I am aware of the risks of Covid-19, and I believe that proper safeguards can be in place so that children can attend physical school.

7. I do not agree that my chosen school should not be allowed to open because of other parts of the county or state. My chosen school does not pose a substantial risk.

8. I also do not understand why my daughter can spend all day in daycare, but not spend all day in school, learning.

9. As a taxpaying Californian, I also am concerned that I am paying taxes, but receiving no benefit at all.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct and is executed this 28<sup>th</sup> day of July 2020, at Riverside County, California.

DocuSigned by:  
  
Erica Sephton

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**  
 16 Plaintiffs,  
 17 v.  
 18 **GAVIN NEWSOM, et al.**  
 19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF KENENTH**  
 21 **FLEMING IN SUPPORT OF**  
 22 **MOTION FOR PRELIMINARY**  
 23 **INJUNCTION**

Judge: Hon. Dean D. Pregerson

24 I, Kenneth Fleming, declare:

- 25 1. I am a resident of Long Beach, Los Angeles County, California.
- 26 2. My daughter is a high-achieving student athlete heading into her senior
- 27 year of high school.
- 28 3. She will need to rely on scholarship monies to attend college.
4. Grades and activities are very important factors considered by colleges in
- order to obtain the best college scholarship.
5. As a result of the requirement to move schools to distance learning, my



1 daughter’s school chose to use a credit/no credit grading system instead of a normal  
2 grading system.

3 6. This negatively impacts her grades because instead of scoring points  
4 towards an “A” (or another letter grade), she has lost her chance to increase her GPA in  
5 order to be a better and more competitive candidate.

6 7. Standardized testing has also been cancelled by the Governor, and my  
7 daughter is concerned she will not be able to assess her progress in school. She will  
8 need to take the SAT and ACT and she is unsure how prepared she is for these very  
9 important tests.

10 8. Additionally, she takes AP classes and is unsure how these advanced  
11 classes will be impacted by distance learning.

12 9. To obtain the best scholarship, she will need to be well-rounded in her  
13 education and participate in extracurricular activities and sports. Due to distance  
14 learning, many of these activities, including sports, have been cancelled.

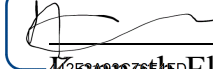
15 10. Cancelling these types of programs will also negatively affect her  
16 scholarship chances.

17 11. My daughter has worked tirelessly to be the best well-rounded student she  
18 can be, so that she can attend her dream college.

19 12. With the negative effects of distance learning such as no grades, no  
20 opportunities for advancement in sports, and no effective standardized testing markers,  
21 my daughter and I are very worried about her future as the schools are not preparing her  
22 academically (or athletically, since it important to be well-rounded to obtain  
23 scholarships to college.)

24 I declare under penalty of perjury under the laws of the United States of America  
25 that the foregoing is true and correct and is executed this 28<sup>th</sup> day of July 2020, at Los  
26 Angeles County, California.

DocuSigned by:



Kenneth Fleming

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
**THE CENTRAL DISTRICT OF CALIFORNIA**

14 **MATTHEW BRACH, et al.**

15 Plaintiffs,  
16 v.

17 **GAVIN NEWSOM, et al.**

18 Defendants.

19 Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF JOHN**  
**ZEIGLER IN SUPPORT OF**  
**MOTION FOR PRELIMINARY**  
**INJUNCTION**

21 Judge: Hon. Dean D. Pregerson

22 I, John Ziegler, declare:

23 1. I am a resident of Ventura County, California.

24 2. I am the father of an eight-year old girl enrolled in public school.

25 3. As a result of my daughter's school moving to distance-learning, I  
 26 witnessed that my daughter has fallen behind in schooling and is not prepared for her  
 27 upcoming second grade school year.

28 4. Starting a new grade level, completely online also does not allow for



1 proper bonding and engagement with her teachers.

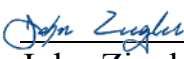
2 5. Additionally, the Zoom system is technologically not very sound and  
3 suffers from several glitches.

4 6. My wife is a school teacher but she will be unable to return to teaching due  
5 to distance learning and taking care of our daughter. Our daughter is too young to be  
6 home alone. This leaves us with only one income.

7 7. While my wife is a school teacher, she gets paid to teach at the local  
8 school, she won't receive her income by staying at home and teaching our young  
9 daughter.

10 8. Only one income is a financial hardship for our family, and on top of my  
11 daughter not receiving an adequate education from our local public school, the hardship  
12 and worry for our family is compounded.

13 I declare under penalty of perjury under the laws of the United States of America  
14 that the foregoing is true and correct and is executed this 28<sup>th</sup> day of July 2020, at  
15 Ventura County, California.

16 DocuSigned by:  
17   
18 John Ziegler

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**  
 16 Plaintiffs,  
 17 v.  
 18 **GAVIN NEWSOM, et al.**  
 19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF ALISON**  
 21 **WALSH IN SUPPORT OF**  
 22 **MOTION FOR PRELIMINARY**  
 23 **INJUNCTION**

Judge: Hon. Dean D. Pregerson

24 I, Alison Walsh, declare:

- 25 1. I am a resident of Orange County, California.
- 26 2. During the 2019-2020 school year, my two children were enrolled in and
- 27 attended local public school.
- 28 3. The school moved to online learning after an extended Spring Break, due
- to the shutdown orders.
4. But when the school was shut down and education was moved to distance



1 learning, what was provided was not learning in any sense of the word, as the school  
2 did not provide live or recorded online instruction, only work packets that the student  
3 had to complete and submit.

4 5. It seemed that the students were supposed to teach themselves.

5 6. Both my husband and I work full time and we are not able to provide the  
6 education that our children need. We need the school to provide the education, not us.

7 7. As a result, our children have fallen behind for the 2019-2020 school year.

8 8. My husband and I had to make a hard choice to enroll our children in  
9 private school, at a significant financial hardship in order to make sure our children are  
10 in an effective learning environment for the upcoming year.

11 9. Now, due to Governor Newsom's orders that apply to private schools, our  
12 children are at risk yet again of not having proper instruction.

13 10. I believe that access to live education is an essential right and our state is  
14 denying our children of this right.

15 I declare under penalty of perjury under the laws of the United States of America  
16 that the foregoing is true and correct and is executed this 28<sup>th</sup> day of July 2020, at  
17 Orange County, California.

DocuSigned by:

  
Alison Walsh

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
**THE CENTRAL DISTRICT OF CALIFORNIA**

14 **MATTHEW BRACH, et al.**

15 Plaintiffs,  
16 v.

17 **GAVIN NEWSOM, et al.**

18 Defendants.  
19

Case No.: 2:20-cv-06472 DDP (AFMx)

**DECLARATION OF ROGER**  
**HACKETT IN SUPPORT OF**  
**MOTION FOR PRELIMINARY**  
**INJUNCTION**

Judge: Hon. Dean D. Pregerson

20  
21 I, Roger Hackett, declare:

- 22 1. I am a resident of Ventura County, California.
- 23 2. I am a parent of a soon-to-be 6<sup>th</sup> grader that attends a private school.
- 24 3. I have reviewed Governor Newsom’s July 17 framework and have
- 25 concerns that it unfairly lumps all schools together, county-wide, when determining risk
- 26 rates and school closures.
- 27 4. For example, under Newsom’s orders, a school in a lesser populated area
- 28





1 of Los Angeles county is treated the same as a school in a very densely populated area,  
2 like downtown Los Angeles.

3 5. So, even though my son’s school is in Westlake Village (very few Covid-  
4 19 positive cases), we are treated the same as Los Angeles County as a whole and Los  
5 Angeles City in particular.

6 6. Also, the orders don’t take into account each individual school when  
7 determining school closures, which is unfair since some schools, like my son’s school,  
8 are going above and beyond, making huge investments of effort and money to comply  
9 with the CDC and health directives, so that the children can safely attend school in  
10 person – which is something that students, parents, and teachers at my son’s school  
11 desire.

12 7. I also think it is unfair that the waiver process allows for elementary  
13 schools to apply for a waiver, but not a high school for example.

14 8. Governor Newsom’s orders also interferes with my right to parent my  
15 child and determine how best he should be educated. My son would best benefit from  
16 in-person instruction. This is best for his emotional health and also best education-wise.

17 I declare under penalty of perjury under the laws of the United States of America  
18 that the foregoing is true and correct and is executed this 28<sup>th</sup> day of July 2020, at  
19 Ventura County, California.

DocuSigned by:

*Roger Hackett*

Roger Hackett

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF CHRISTINE**  
 21 **RUIZ IN SUPPORT OF MOTION**  
 22 **FOR PRELIMINARY INJUNCTION**

Judge: Hon. Dean D. Pregerson

23 I, Christine Ruiz, declare:

- 24 1. I am a resident of Los Angeles County, California.
- 25 2. We are a minority family and my sons attend public school.
- 26 3. Both of my sons in school have special needs. They both suffer from  
27 autism.
- 28 4. My middle son's autism is severe. He has an individualized education  
program (IEP) that requires a dedicated team of educated and credentialed staff,



1 working one-on-one, and are hands-on with him the entire school day.

2 5. Since school was shut down, he has not been provided with any of his  
3 services that are required by his IEP.

4 6. Due to his disabilities, ZOOM classes are a useless form of education for  
5 my son. He cannot sit still and he does not have the ability to understand commands  
6 through an online format.

7 7. As a parent who does not have a degree in education, much less special  
8 education, I was at a loss on how to teach my son at home during the school closure.

9 8. It is mandated that my son receive a free, appropriate public education  
10 (FAPE) – this is the law.

11 9. As a result of this denial of his FAPE, I have had to pay out of pocket for  
12 assistance and services to make sure he was being educated.

13 10. It is a burden on my family to find the finances for these added expenses,  
14 especially when we pay taxes which go towards education.

15 11. My youngest son has autism also, and he is in a mild to moderate special  
16 education class.

17 12. In my youngest son's class, there are aides to assist the main teacher, plus  
18 a smaller teacher to student ratio.

19 13. Since the schools were shut down in March of this year, the online classes  
20 that were supposed to take the place of my youngest son's usual (in person) classes are  
21 nothing more than a link to watch a video, lasting around a half hour per day. This is  
22 not learning.

23 14. I felt no choice but to hire a tutor to help my youngest son.

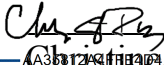
24 15. Due to both of my son's disabilities, they need a specially trained team to  
25 help them meet the requirements of the IEPs.

26 16. My sons are not being provided an education by the school.

27 17. The regression of my sons, as special education students, is very real and  
28 very worrisome.

1            18.    Autistic children’s futures are always precarious due to the nature of the  
 2 disability, but now, with the lack of education and no team support, my sons will be at  
 3 an even greater disadvantage than before. This is unacceptable.

4  
 5            I declare under penalty of perjury under the laws of the United States of America  
 6 that the foregoing is true and correct and is executed this 28<sup>th</sup> day of July 2020, at Los  
 7 Angeles County, California.

8  
 9            DocuSigned by:  
  
 10            \_\_\_\_\_  
 Christine Ruiz

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25
- 26
- 27
- 28



1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
**THE CENTRAL DISTRICT OF CALIFORNIA**

14 **MATTHEW BRACH, et al.**

15 Plaintiffs,  
16 v.

17 **GAVIN NEWSOM, et al.**

18 Defendants.  
19

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF MARIANNE**  
**BEMA IN SUPPORT OF MOTION**  
**FOR PRELIMINARY INJUNCTION**

Judge: Hon. Dean D. Pregerson

21 I, Marianne Bema, declare:

- 22 1. I am a resident of Los Angeles County, California.
- 23 2. I have three school-aged children.
- 24 3. I am very concerned about the format and quality of education that is  
 25 present during distance learning.
- 26 4. My children were not very attentive to the online learning format, which is  
 27 certainly normal for teenage boys and young children.  
 28



1           5.     Online classes were only a few hours a week instead of the usual school-  
2 length day.

3           6.     During the online classes, the student's attention was minimal and on one  
4 occasion, the teacher became frustrated and quit the online session early.

5           7.     The online classes were not very safe, and were subject to hacking.

6           8.     Additionally, the internet connection at my house is very spotty  
7 (sometimes it works and sometimes it doesn't) which causes problem when relying for  
8 school to be conducted solely online.

9           9.     I am originally from Cameroon, Africa and even though I speak several  
10 languages, there is small language barrier, and it is difficult to fully teach my children  
11 like a trained teacher would be able to.

12          10.    It is best for my children to be in school, paying attention, with trained  
13 teachers.

14          11.    My eleven-year old's distance learning schedule consisted of logging onto  
15 virtual class, three times per week; this is not an education.

16          12.    Also my children have IEPs, which were haphazardly implemented (even  
17 before the shutdown). This is another concern for me.

18          13.    My boys are very active and used to being involved with sports; this is  
19 another thing that has been taken away from them.

20          14.    Children at home are exposed to dangerous social media interactions and  
21 can be easily tracked by predators if they are forced to be online for so many hours, due  
22 to distance learning.

23          15.    Children build their personality from their interactions with other children.

24          16.    I also believe that parents are not professional educators,

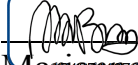
25          17.    Teachers are trained to be watchful - education is also eyes and  
26 movements. Teachers can easily define if a child is doing well or not by observing the  
27 child's actions in class.

28          18.    Nothing good for children will come from keeping them out of school.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct and is executed this 28<sup>th</sup> day of July 2020, at Los Angeles County, California.

DocuSigned by:



Marianne Bema

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**  
 16 Plaintiffs,  
 17 v.  
 18 **GAVIN NEWSOM, et al.**  
 19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF ASHLEY**  
 21 **RAMIREZ IN SUPPORT OF**  
 22 **MOTION FOR PRELIMINARY**  
 23 **INJUNCTION**

Judge: Hon. Dean D. Pregerson

24 I, Ashley Ramirez, declare:

- 25 1. I am a resident of San Diego County, California.
- 26 2. I have three school-aged children, ages 10, 8 and 4.
- 27 3. One of my sons and I tested positive for Covid, but have fully recovered.
- 28 4. Even with having personally experienced Covid, I still advocate for my children to return to school.





1           5.     Schools can be opened safely.

2           6.     Due to the school shutdowns, I have been trying to find a remote job so I  
3 can feed my family while watching my boys, this job search has proven difficult.

4           7.     On top of searching for work, I have had to become a teacher for my  
5 children due to the mandatory school closures in Spring of 2020.

6           8.     My oldest son has an IEP.

7           9.     Due to his diagnosis, he cannot tolerate distance learning and he basically  
8 shut down.

9           10.    We have also struggled with behavior problem for my youngest child.

10          11.    As a concerned parent, I try to limit my children's screen time because of  
11 the negative and addictive affects.

12          12.    Distance learning encourages screen time, which causes problems in trying  
13 to limit screen time outside of distance-learning.

14          13.    My oldest two have attended camp in-person and my youngest is in  
15 daycare.

16          14.    If it is safe to attend these things in-person, then why are the schools not re  
17 opening?

18          15.    My children also benefit from the free breakfast and lunch program. This  
19 helps our finances and is necessary for our family.

20          16.    COVID 19 shutdowns have been negatively impacting our health  
21 emotionally, physically, mentally, and now we may be going into severe financial  
22 trouble which will make the ones I listed before worse.

23          17.    I believe the shutdown is way worse than the virus itself from our  
24 experience as a family (except for those that have underlying conditions and elderly).

25          18.    I think we need to open schools.

26          19.    My children want to go to school.

27          20.    We can open schools safely and take precautions.

28

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct and is executed this 28<sup>th</sup> day of July 2020, at San Diego County, California.

DocuSigned by:  
*Ashley Ramirez*  
Ashley Ramirez

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

**DECLARATION OF TIFFANY**  
**MITROWKE IN SUPPORT OF**  
**MOTION FOR PRELIMINARY**  
**INJUNCTION**

Judge: Hon. Dean D. Pregerson

20  
21  
22 I, Tiffany Mitrowke, declare:

- 23 1. I am a resident of San Diego, California.
- 24 2. I am a single mother of a seven-year old boy.
- 25 3. When my son’s school went online in the Spring of 2020, the teachers
- 26 simply sent homework packets for him to complete through the week.
- 27 4. No one from the school called or reached out to check on his progress.
- 28 5. Besides not being taught in any sense of the word, he is suffering daily



1 from the isolation.

2 6. I hear him crying in the shower because he misses his friends at school and  
3 is worried about them.

4 7. I have repeatedly reached out to the school for answers about what will  
5 happen next year but the school has no specific response.

6 8. No one knows how to plan or what to expect.

7 9. I would like to pay someone to homeschool my son, but I have heard  
8 estimates that the cost is \$20 per hour. I can't afford this.

9 10. The school receives funds for school yet they are not providing him with  
10 an education.

11 11. My child desperately wants to return to school.

12 12. I want the schools to open up in the Fall 2020.

13

14 I declare under penalty of perjury under the laws of the United States of America  
15 that the foregoing is true and correct and is executed this 28<sup>th</sup> day of July 2020, at San  
16 Diego County, California.

17

DocuSigned by:  
*Tiffany Mitrowke*  
Tiffany Mitrowke

18

19

20

21

22

23

24

25

26

27

28

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
 14 **THE CENTRAL DISTRICT OF CALIFORNIA**

15 **MATTHEW BRACH, et al.**

16 Plaintiffs,  
17 v.

18 **GAVIN NEWSOM, et al.**

19 Defendants.

Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF ADEBUKOLA**  
 21 **ONIBOKUN IN SUPPORT OF**  
 22 **MOTION FOR PRELIMINARY**  
 23 **INJUNCTION**

24 Judge: Hon. Dean D. Pregerson

25 \*



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

I, Adebukola Onibokum declare:

1. I am a resident of Santa Clara County, California.
2. Even though I am a neurosurgeon, I am bringing this suit in my individual capacity.
3. I have two school-aged children.
4. They attend a private, parochial school and their school has applied for a waiver so that regular classes can begin soon.
5. My children’s school provided distance learning as a result of the shut-down in March.
6. Distance learning is not comparable to attending school in-person, with other students and teachers.
7. Just one or two online sessions of instruction per day is not adequate for a proper education.
8. The quality, intensity, and diversity of the instruction kids are receiving has been negatively impacted by distance learning. The depth of the distance learning via Zoom is nowhere close to what kids were receiving during in-class sessions.
9. Teachers are very important as instructors and can provide immediate feedback- this type of interaction is absent from online instruction.
10. My children went to summer camp recently and returned much happier- the social interaction they had with other children was vital to their well-being.
11. If camps are safe to attend, then schools should be open.
12. My children want to return to school in-person.
13. I think it is safe for them to return to in-person school.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct and is executed this 28th day of July 2020, at Santa



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

Clara County, California.

Dated: July 28, 2020

DocuSigned by:  
*Adebukola Onibokun*  
Adebukola Onibokun

1 HARMEET K. DHILLON (SBN: 207873)  
 2 harmeet@dhillonlaw.com  
 3 MARK P. MEUSER (SBN: 231335)  
 4 mmeuser@dhillonlaw.com  
 5 GREGORY R. MICHAEL (SBN: 306814)  
 6 gmichael@dhillonlaw.com  
 7 DHILLON LAW GROUP INC.  
 8 177 Post Street, Suite 700  
 9 San Francisco, California 94108  
 10 Telephone: (415) 433-1700  
 11 Facsimile: (415) 520-6593

12 *Attorneys for Plaintiffs*

13 **UNITED STATES DISTRICT COURT FOR**  
**THE CENTRAL DISTRICT OF CALIFORNIA**

14 **MATTHEW BRACH, et al.**

15 Plaintiffs,  
16 v.

17 **GAVIN NEWSOM, et al.**

18 Defendants.

19 Case No.: 2:20-cv-06472 DDP (AFMx)

20 **DECLARATION OF BRIAN**  
**HAWKINS IN SUPPORT OF**  
**MOTION FOR PRELIMINARY**  
**INJUNCTION**

21 Judge: Hon. Dean D. Pregerson

22 I, Brian Hawkins declare:

- 23 1. I am a resident of San Jacinto, Riverside County, California.
- 24 2. I have two children, an eight-year old girl and a seven-year old boy.
- 25 3. I am a proud African American father and pastor of a church.
- 26 4. My son has an IEP in place.
- 27 5. He suffers from ADHD and needs special assistance with staying focused on tasks and he must be prompted to concentrate and complete his school-work.
- 28 6. His IEP specifies that he is to have a special aide in the class to help him





1 throughout the entire school day.

2 7. He also receives special services, outside of the regular classroom, several  
3 hours per week.

4 8. I am concerned that my son is spending too much time by himself now,  
5 and not going back to in-person learning will negatively affect him socially and  
6 emotionally (which is also something of a concern due to specifics in his IEP).

7 9. After the shut down in March of 2020, his school only provided him with  
8 distance learning, the plan was for him to log into “Class Dojo” which was supposedly  
9 to substitute for classroom learning.

10 10. None of his IEP services can properly be implemented through distance  
11 learning.

12 11. Due to his ADHD, the online format was difficult for him to follow and to  
13 comprehend, and he struggled a lot.

14 12. My daughter will be entering the third grade in the Fall of 2020.

15 13. She is extremely social and talkative, however she reports to me that she is  
16 angry.

17 14. She tells me that she is “mad about not going to school,” “wants to make  
18 new friends,” and wants to “learn to write in cursive.”

19 15. I have also seen physical symptoms manifest as a result of her anxiousness  
20 in not attending school, not having interactions with classmates, and being isolated in  
21 the distance learning environment.

22 16. I am a full-time pastor and my children have been forced to go to my office  
23 with me – this is not an appropriate classroom environment.

24 17. I have personally spoken with many individuals in my community and  
25 have counseled parents and kids who are depressed and suicidal.

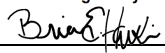
26 18. We need to get our children back in the classroom.

27 19. It is harmful to let the school shutdowns continue.

28

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct and is executed this 28<sup>th</sup> day of July 2020, at Riverside County, California.

DocuSigned by:  
  
\_\_\_\_\_  
Brian Hawkins