

1 Charles S. LiMandri (SBN: 110841)  
Paul M. Jonna (SBN: 265389)  
2 Jeffrey M. Trissell (SBN: 292480)  
LIMANDRI & JONNA LLP  
3 P.O. Box 9120  
4 Rancho Santa Fe, CA 92067  
Telephone: (858) 759-9930  
5 Facsimile: (858) 759-9938  
6 cslimandri@limandri.com  
pjonna@limandri.com  
7 jtrissell@limandri.com

Harmeet K. Dhillon (SBN:207873)  
Mark P. Meuser (SBN: 231335)  
Gregory R. Michael (SBN: 306814)  
DHILLON LAW GROUP INC.  
177 Post Street, Suite 700  
San Francisco, CA 94108  
Telephone: 415-433-1700  
Facsimile: 415-520-6593  
harmeet@dhillonlaw.com  
mmeuser@dhillonlaw.com  
gmichael@dhillonlaw.com

8 Thomas Brejcha, *pro hac vice*\*  
9 Peter Breen, *pro hac vice*\*  
THOMAS MORE SOCIETY  
10 309 W. Washington St., Ste. 1250  
11 Chicago, IL 60606  
Telephone: (312) 782-1680  
12 tbrejcha@thomasmoresociety.org  
13 pbreen@thomasmoresociety.org  
14 \*Application forthcoming

Attorneys for Plaintiffs

15 Attorneys for Plaintiffs

16  
17 UNITED STATES DISTRICT COURT  
18 SOUTHERN DISTRICT OF CALIFORNIA

19 SOUTH BAY UNITED PENTECOSTAL  
20 CHURCH, a California non-profit  
corporation; and BISHOP ARTHUR  
21 HODGES III, an individual,  
22 Plaintiffs,  
23 v.  
24 GAVIN NEWSOM, in his official capacity  
25 as the Governor of California, *et al.*,  
26 Defendants.

Case No. 3:20-cv-865-BAS

**Declaration of Dr. Jayanta  
Bhattacharya in Support of  
Plaintiffs' Renewed Motion for a  
Temporary Restraining Order /  
Preliminary Injunction; and  
Request for Leave to File Late  
Declaration**

Judge: Hon. Cynthia Bashant

1 **TO: THE COURT, ALL PARTIES, AND THEIR ATTORNEYS OF**  
2 **RECORD:**

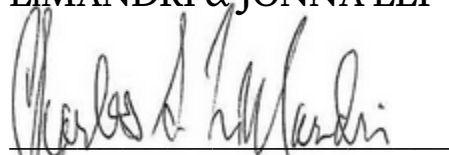
3 PLEASE TAKE NOTICE that Plaintiffs South Bay United Pentecostal  
4 Church and Bishop Arthur Hodges III, by and through counsel, have retained Prof.  
5 Jayanta Bhattacharya, M.D., Ph.D. to provide an expert declaration in this action.  
6 Plaintiffs reviewed Dr. Bhattacharya's declaration filed in *Brach v. Newsom*, No. 2:20-  
7 cv-6472-SVW-AFM (N.D. Cal. Aug. 3, 2020), and concluded that many of his  
8 opinions directly relevant to this action. Specifically, the opinions which Dr.  
9 Bhattacharya made at paragraphs 1-14 and 31-43 are directly relevant. The opinions  
10 in paragraphs 15-42 also translate because California uses the same "monitoring list"  
11 to determine whether schools and churches must be shuttered. However, due to  
12 other commitments, Plaintiffs and Dr. Bhattacharya were unable to prepare a  
13 declaration for filing in this action by August 10, 2020. Thus, Plaintiffs respectfully  
14 request leave to file such declaration by no later than Friday, August 14, 2020. In the  
15 interim, Plaintiffs are submitting Dr. Bhattacharya's previously prepared declaration,  
16 which is consistent with the opinions Plaintiffs would have him provide in this action,  
17 and request that the Court take judicial notice of it. *See* Fed. R. Civ. P. 201;  
18 *ReadyLink Healthcare, Inc. v. State Comp. Ins. Fund*, 754 F.3d 754, 756 n.1 (9th Cir.  
19 2014) (taking judicial notice of court documents); *Lozman v. City of Riviera Beach,*  
20 *Fla.*, 713 F.3d 1066, 1076 n.9 (11th Cir. 2013) (same).

21  
22  
23  
24  
25  
26  
27  
28

Dated: August 10, 2020

By:

LiMANDRI & JONNA LLP



Charles S. LiMandri  
Paul M. Jonna  
Jeffrey M. Trissell  
Attorneys for Plaintiffs

**ATTACHMENT**

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**, an individual,  
16 *et al.*,

17 Plaintiffs,  
18 v.

19 **GAVIN NEWSOM**, in his official  
20 capacity as the Governor of California,  
21 *et al.*,

22 Defendants.

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

**DECLARATION OF DR. JAYANTA  
 BHATTACHARYA IN SUPPORT OF  
 APPLICATION FOR TEMPORARY  
 RESTRAINING ORDER**

Judge: Hon. Stephen V. Wilson  
 Courtroom: 10A

23 I, JAYANTA BHATTACHARYA, declare as follows:

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

26 2. I am a Professor of Medicine at Stanford University and have worked on the  
27 Stanford University faculty since 2001. I had an MD and a Ph.D. in economics, both  
28 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-  
 26 childcare/reopening-schools.html](https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/reopening-schools.html)

27 <sup>7</sup> Newsom G (2020) Executive Order N-60-20. [https://www.gov.ca.gov/wp-  
 28 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)

<sup>8</sup> California Department of Public Health (2020) COVID-19 and Reopening In-Person  
 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 <sup>24</sup> Meyerowitz-Katz, G., & Merone, L. (2020). A systematic review and meta-analysis  
27 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,  
 23 <https://www.medrxiv.org/content/10.1101/2020.04.14.20062463v2> (April 30, 2020)

24 <sup>28</sup> Age Group in California, *Cases and Deaths Associated with COVID-19*, California  
 25 Department of Public Health,  
 26 [https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/COVID-19/COVID-19-Cases-](https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/COVID-19/COVID-19-Cases-by-Age-Group.aspx)  
 27 [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).

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

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

DocuSign Envelope ID: D2ECEBDE-D889-4E55-80D9-495F21408483

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  
28

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

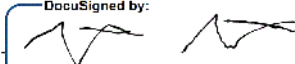


DocuSign Envelope ID: D2ECEBDE-D889-4E55-80D9-495F21408483

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 and the State of California that the foregoing is true and correct.

Dated: July 27, 2020

DocuSigned by:  
  
06C5AAC4D4174D0  
Jayanta Bhattacharya, M.D., F.R.C.P.