EXHIBIT 1

UNITED STATES DISTRICT COURT
MIDDLE DISTRICT OF FLORIDA
TAMPA DIVISION

ISRAEL ALVARADO, et al.,	:	
	:	
Plaintiffs,	:	
	:	
v.	:	**Case No. 8:22-CV-1149-WFJ-CPT**
	:	
LLOYD AUSTIN, III, et al.,	:	
	:	
Defendants.	:	
	:	

EXPERT REPORT OF DR. JAYANTA BHATTACHARYA

EXPERIENCE & CREDENTIALS

1. I am a former Professor of Medicine and current Professor of Health Policy at Stanford University School of Medicine and a research associate at the National Bureau of Economic Research. I am also the Director of Stanford's Center for Demography and Economics of Health and Aging. I hold an M.D. and Ph.D. from Stanford University. I have published 160 scholarly articles in peer-reviewed journals in the fields of medicine, economics, health policy, epidemiology, statistics, law, and public health, among others. My research has been cited in the peer-reviewed scientific literature more than 13,300 times. My curriculum vitae is attached to this declaration as Exhibit A.

2. I have dedicated my professional career to analyzing health policy, including infectious disease epidemiology and policy, and the safety and efficacy of medical interventions. I have studied extensively and commented publicly on the necessity and safety of vaccine requirements for those who have contracted and recovered from COVID-19 (individuals who have "recovered immunity," sometimes called "natural immunity"). I am familiar with the emergent scientific and medical literature on this topic

and pertinent government policy responses to the issue both in the United States and abroad.

3. My assessment of vaccine immunity is based on studies on the efficacy and safety of the two vaccines to receive full approval from the Food and Drug Administration (FDA) and the one vaccine for which the FDA has granted Emergency Use Authorization (EUA) for use in the United States. These include two mRNA-technology vaccines (manufactured by Pfizer-BioNTech and Moderna) and an adenovirus-vector vaccine technology (manufactured by Johnson & Johnson). Of those, the Pfizer vaccine, also known as Comirnaty, and Moderna vaccine have full FDA approval.

4. I have been asked to provide my opinion on several matters related to the use of one of the COVID-19 vaccines above:

- Based on current medical and scientific knowledge, the risk SARS-CoV-2 virus poses to different population groups;
- Whether, based on the current medical and scientific knowledge, vaccines effectively protect against infection (and therefore disease spread);
- Whether, based on the current medical and scientific knowledge, immunity after COVID recovery is categorically inferior to vaccine immunity to prevent reinfection and transmission of the SARS-CoV-2 virus;
- Whether, based on the existing medical and scientific understanding of SARS-CoV-2 transmission and recovery, there is any categorical distinction between recovered immunity and vaccine immunity;

- Whether there is scientific evidence to support the notion that immunity provided by COVID recovery should not be considered as a reason to be excused from a vaccine mandate;
- Whether, based on the current medical and scientific knowledge, Omicron presents a grave danger to the population; and
- Whether, based on the current medical and scientific knowledge, vaccines are effective at preventing Omicron infections.
- Whether, based on the current medical and scientific knowledge, healthcare staff and the public's vaccination status affects the spread and transmission of COVID-19 within healthcare settings.

5. I can summarize my opinions briefly. The scientific evidence strongly indicates that for the vast majority of children and young adults, COVID-19 infection poses less mortality risk than seasonal influenza; while the COVID vaccines are effective at protecting vaccinated individuals against severe disease, they provide only short-lasting and limited protection versus infection and disease transmission; the recovery from COVID disease provides strong and lasting protection against severe disease (hospitalization or death) if reinfected, at least as good and likely better than the protection offered by the COVID vaccines; requiring vaccines for COVID recovered patients, thus, provides only a limited benefit while exposing them to the risks associated with the vaccination; Omicron does not present a grave danger to most of the population; and vaccines are ineffective at preventing Omicron infections.

6. I have not and will not receive any financial or other compensation to prepare this report or to testify in this case. Nor have I received compensation for preparing

declarations or reports or for testifying in *any* other case related to the COVID-19 pandemic or any personal or research funding from any pharmaceutical company. My participation here has been motivated solely by my commitment to public health, just as my involvement in other cases has been.

OPINIONS

I. COVID-19 Infection Fatality Risk

7. SARS-CoV-2, the virus that causes COVID-19 infection, entered human circulation in 2019 in China. The virus itself is a member of the coronavirus family of viruses, several of which cause typically mild respiratory symptoms upon infection in humans. The SARS-CoV-2 virus, by contrast, induces a wide range of clinical responses upon infection. These presentations range from entirely asymptomatic infection to mild upper respiratory disease with unusual symptoms like loss of sense of taste and smell, hypoxia, or a deadly viral pneumonia that is the primary cause of death due to SARS-CoV-2 infection.

8. The mortality danger from COVID-19 infection varies substantially by age and a few chronic disease indicators.[1] For most of the population, including the vast majority of children and young adults, COVID-19 infection poses less mortality risk than seasonal influenza. By contrast, for older people – especially those with severe comorbid chronic conditions – COVID-19 infection poses a high infection fatality risk, on the order of 5%.

[1] Public Health England (2020) Disparities in the Risk and Outcomes of COVID-19. August 2020. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/908434/Disparities_in_the_risk_and_outcomes_of_COVID_August_2020_update.pdf

9. The best evidence on the infection fatality rate from SARS-CoV-12 infection (that is, the fraction of infected people who die due to the infection) comes from seroprevalence studies. The definition of seroprevalence of COVID-19 is the fraction of people in a population who have specific antibodies against SARS-CoV-2 in their bloodstream. A seroprevalence study measures the fraction of a population with antibodies produced specifically by people infected by the SARS-CoV-2 virus. Specific antibodies in blood provide excellent evidence that an individual was previously infected.

10. Seroprevalence studies provide better evidence on the total number of people who have been infected than do case reports or positive reverse transcriptase-polymerase chain reaction (RT-PCR) test counts. PCR tests are the most common test used to check whether a person currently has the virus or viral fragments in their body (typically in the nasopharynx). The PCR test should not be used to count the total number of people infected to date in a population. Case reports and PCR test counts both miss infected people who are not identified by the public health authorities or who do not volunteer for RT-PCR testing. That is, they miss people who were infected but recovered from the condition without coming to the attention of public health authorities. Because they ignore unreported infections, fatality rate estimates based on case reports or positive test counts are substantially biased toward reporting a higher fatality rate.

11. According to a meta-analysis[2] by Dr. John Ioannidis of every seroprevalence study conducted to date of publication with a supporting scientific paper (74 estimates from 61 studies and 51 different localities worldwide), the median infection survival rate—the inverse of the infection fatality rate—from COVID-19 infection is

[2] John P.A. Ioannidis , *The Infection Fatality Rate of COVID- 19 Inferred from Seroprevalence Data*, Bulletin of the World Health Organization BLT 20.265892.

99.77%. For COVID-19 patients under 70, the meta-analysis finds an infection survival rate of 99.95%. A separate meta-analysis[3] by other scientists independent of Dr. Ioannidis' group reaches qualitatively similar conclusions.

12. A study of the seroprevalence of COVID-19 in Geneva, Switzerland (published in *The Lancet*)[4] provides a detailed age breakdown of the infection survival rate in a preprint companion paper:[5] 99.9984% for patients 5 to 9 years old; 99.99968% for patients 10 to 19 years old; 99.991% for patients 20 to 49 years old; 99.86% for patients 50 to 64 years old; and 94.6% for patients above 65.

13. I estimated the age-specific infection fatality rates from the Santa Clara County seroprevalence study[6] data (for which I am the senior investigator). The infection survival rate is 100% among people between 0 and 19 years (there were no deaths in Santa Clara in that age range up to that date); 99.987% for people between 20 and 39 years; 99.84% for people between 40 and 69 years; and 98.7% for people above 70 years.

14. Those numbers are consistent with what the US CDC has reported. A US CDC report[7] found between 6 and 24 times more SARS-CoV-2 infections than cases reported between March and May 2020. Correspondingly, the CDC's estimate of the infection fatality rate for people ages 0-19 years is 0.003%, meaning infected children have a 99.997% survivability rate. For people ages 20-49 years, it was 0.02%, meaning that

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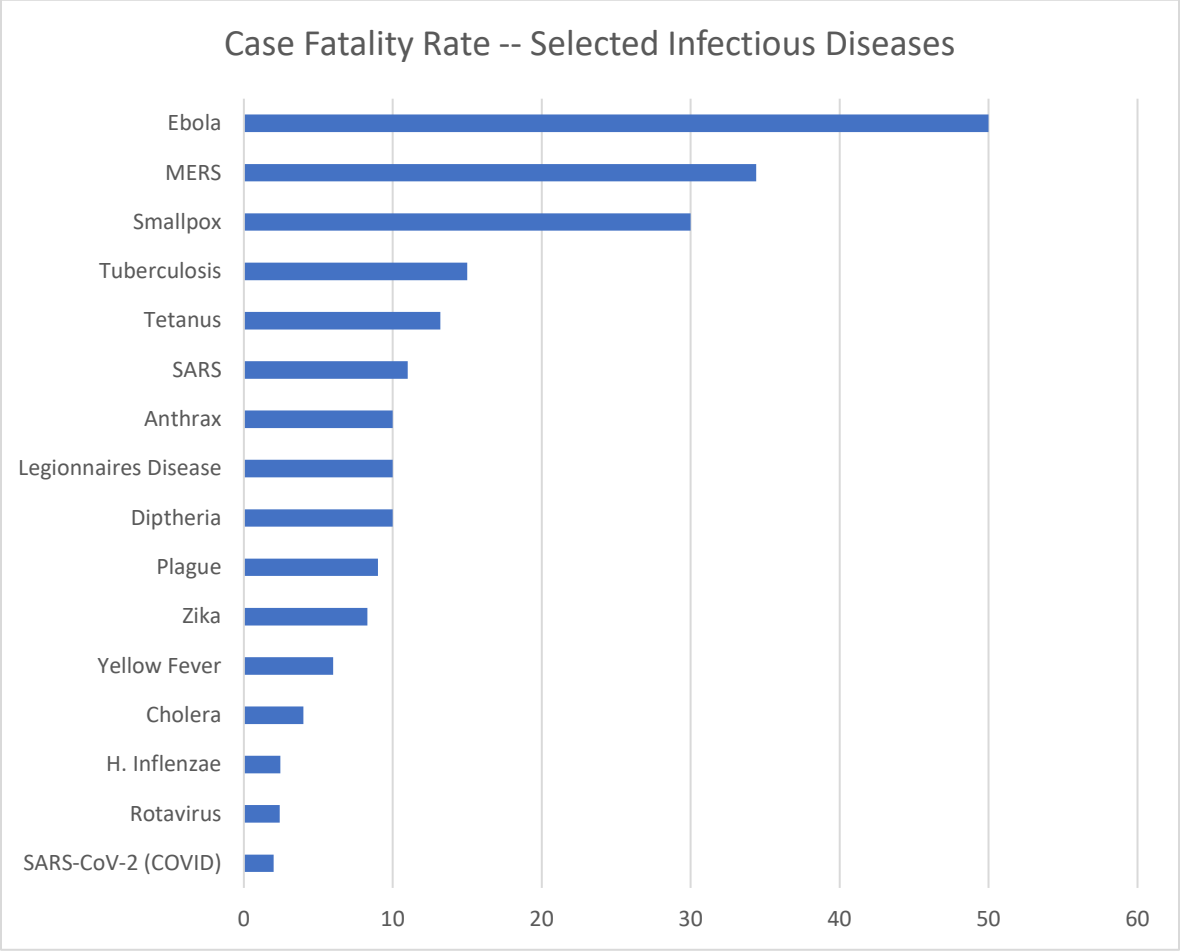
[3] Andrew T. Levin, et al., *Assessing the Age Specificity of Infection Fatality Rate for COVID- 19: Meta-Analysis & Public Policy Implications* (Aug. 14, 2020) MEDRXIV, http://bit.ly/3gplolV.
[4] Silvia Stringhini, et al., *Seroprevalence of Anti-SARS-CoV-2 lgG Antibodies in Geneva, Switzerland (SEROCoV-POP): A Population Based Study* (June 11, 2020) THE LANCET, https://bit.ly/3187S13.
[5] Francisco Perez-Saez, et al. *Serology- Informed Estimates of SARS-COV-2 Infection Fatality Risk in Geneva, Switzerland* (June 15,2020) OSF PREPRINTS, http://osf.io/wdbpe/.
[6] Eran Bendavid, et al., *COVID- 19 Antibody Seroprevalence in Santa Clara County, California* (April 30,2020) INT J EPIDEMIOL. 2021 May 17;50(2):410-419. doi: 10.1093/ije/dyab010. PMID: 33615345; PMCID: PMC7928865. https://pubmed.ncbi.nlm.nih.gov/33615345/
[7] Fiona P. Havers, et al., *Seroprevalence of Antibodies to SARS-CoV-2 in 10 Sites in the United States, March 23-May 12, 2020* (Jul. 21, 2020) JAMA INTERN MED., https://bit.ly/3goZUgy.

young adults have a 99.98% survivability rate. For people ages 50-69 years, it was 0.5%, meaning this age group has a 99.5% survivability rate. Finally, for people ages 70+ years, it was 5.4%, meaning seniors have a 94.6% survivability rate.[8] There is, thus, no substantial qualitative disagreement about the infection fatality rate reported by the CDC and other sources in the scientific literature. This should come as no surprise since they all rely on seroprevalence studies to estimate infection fatality rates. All of these mortality rate estimates are derived from data before the emergence of the Omicron variant, which has caused lower mortality per infection than previous variants.

15. It is helpful to provide some context for how large the mortality risk COVID infection poses relative to the risk posed by other infectious diseases. Since seroprevalence-based mortality estimates are not readily available for every disease, I plot case fatality rates in the figure immediately below, defined as the number of deaths due to the disease divided by the number of identified or diagnosed cases of that disease. The case fatality rate for SARS-CoV-2 is ~2% (though that number has decreased with the availability of vaccines and effective treatments). By contrast, the case fatality rate for SARS is over five times higher than that, and for MERS, it is 16 times higher.

[8] COVID- 19 Pandemic Planning Scenarios, Centers for Disease Control and Prevention, https://www.cdc.gov/coronavirus/2019-ncov/hcp/planning-scenarios.html.



16. Perhaps the most important implication of these estimates is that they identify two distinct populations of people who face a very different risk from COVID infection. One segment – the elderly and others with severe chronic disease – faces a higher mortality risk if infected (especially if unvaccinated and not COVID recovered). A second segment – typically non-elderly people – faces a low mortality risk if infected. Instead, it faces much greater harm from lockdowns, school closures, and other non-pharmaceutical interventions than COVID infection. The right strategy, then, is focused protection of the vulnerable population by prioritizing them for vaccination while lifting lockdowns and other restrictions on activities for the rest since they cause harm without corresponding benefit for the non-vulnerable. The Great Barrington Declaration, of which I am a primary

co-author, describes an alternate policy of focused protection. This policy would lead to fewer COVID-related deaths and fewer non-COVID-related deaths than universal lockdowns or a strategy that lets the virus rip through the population. My co-authors of this Declaration include Prof. Martin Kulldorff of Harvard University and Prof. Sunetra Gupta of Oxford University. Over 15,000 epidemiologists and public health professionals and 50,000 medical professionals have co-signed the Declaration.[9]

II. Recovered immunity Provides Durable Protection Against Reinfection and Against Severe Outcomes If Reinfected; COVID-19 Vaccines Provide Limited Protection Against Infection but Durable Protection Against Severe Outcomes if Infected.

17. Both vaccine-mediated immunity and recovered immunity provide extensive protection against severe disease from subsequent SARS-CoV-2 infection. There is no reason to presume, however, that vaccine immunity offers a higher level of protection than recovered immunity. Since vaccines arrived one year after the disease, there is stronger evidence for long-lasting immunity from recovered immunity than from the vaccines.

18. Both types of immunity are based on the same basic immunological mechanism—stimulating the immune system to generate an antibody response. In clinical trials, the efficacy of those vaccines was initially tested by comparing the antibody levels in the blood of vaccinated individuals to those who had recovered immunity. Later Phase III studies of the vaccines established 94%+ clinical efficacy of the mRNA vaccines

[9] Bhattacharya J, Gupta S, Kulldorff M (2020) Great Barrington Declaration. https://gbdeclaration.org

against symptomatic COVID illness.[10] [11] A Phase III trial showed 85% efficacy for the Johnson & Johnson adenovirus-based vaccine against symptomatic disease.[12]

19. Immunologists have identified many immunological mechanisms of immune protection after recovery from infections. Studies have demonstrated prolonged immunity with respect to memory T and B cells,[13] bone marrow plasma cells,[14] spike-

[10] Baden, L. R., El Sahly, H. M., Essink, B., Kotloff, K., Frey, S., Novak, R., Diemert, D., Spector, S. A., Rouphael, N., Creech, C. B., McGettigan, J., Khetan, S., Segall, N., Solis, J., Brosz, A., Fierro, C., Schwartz, H., Neuzil, K., Corey, L., Zaks, T. for the COVE Study Group (2021). Efficacy and Safety of the mRNA-1273 SARS-CoV-2 Vaccine. *The New England Journal of Medicine*, *384*(5), 403-416. doi: 10.1056/NEJMoa2035389

[11] Polack, F. P., Thomas, S. J., Kitchin, N., Absalon, J., Gurtman, A., Lockhart, S., Perez, J. L., Pérez Marc, G., Moreira, E. D., Zerbini, C., Bailey, R., Swanson, K. A., Roychoudhury, S., Koury, K., Li, P., Kalina, W. V., Cooper, D., Frenck, R. W. Jr., Hammitt, L. L., Gruber, W. C. (2020). Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine. *The New England Journal of Medicine*, *387*(27), 2603-2615. doi: 10.1056/NEJMoa2034577

[12] Sadoff, J., Gray, G., Vandebosch, A., Cárdenas, V., Shukarev, G., Grinsztejn, B., Goepfert, P. A., Truyers, C., Fennema, H., Spiessens, B., Offergeld, K., Scheper, G., Taylor, K. L., Robb, M. L., Treanor, J., Barouch, D. H., Stoddard, J., Ryser, M. F., Marovich, M. A., Douoguih, M. for the ENSEMBLE Study Group. (2021). Safety and Efficacy of Single-Dose Ad26.COV2.S Vaccine against Covid-19. *The New England Journal of Medicine*, *384*(23), 2187-2201. doi: 10.1056/NEJMoa2101544

[13] Dan, J. M., Mateus, J., Kato, Y., Hastie, K. M., Yu, E. D., Faliti, C. E., Grifoni, A., Ramirez, S. I., Haupt, S., Frazier, A., Nakao, C., Rayaprolu, V., Rawlings, S. A., Peters, B., Krammer, F., Simon, V., Saphire, E. O., Smith, D. M., Weiskopf, D., Crotty, S. (2021). Immunological memory to SARS-CoV-2 assessed for up to 8 months after infection. *Science*, *371*, 1-13. doi: 10.1126/science.abf4063 (finding that memory T and B cells were present up to eight months after infection, noting that "durable immunity against secondary COVID-19 disease is a possibility in most individuals").

[14] Turner, J. S., Kim, W., Kalaidina, E., Goss, C. W., Rauseo, A. M., Schmitz, A. J., Hansen, L., Haile, A., Klebert, M. K., Pusic, I., O'Halloran, J. A., Presti, R. M. & Ellebedy, A. H. (2021). SARS-CoV-2 infection induces long-lived bone marrow plasma cells in humans. *Nature*, *595*(7867), 421-425. doi: 10.1038/s41586-021-03647-4 (study analyzing bone marrow plasma cells of recovered COVID-19 patients reported durable evidence of antibodies for at least 11 months after infection, describing "robust antigen-specific, long-lived humoral immune response in humans"); Callaway, E. (2021, May 26). Had COVID? You'll probably make antibodies for a lifetime. *Nature*. https://www.nature.com/articles/d41586-021-01442-9#:~:text=Many%20people%20who%20have%20been,recovered%20from%20COVID%2D191 ("The study provides evidence that immunity triggered by SARS-CoV-2 infection will be extraordinarily long-lasting" and "people who recover from mild COVID-19 have bone-marrow cells that can churn out antibodies for decades").

specific neutralizing antibodies,[15] and IgG+ memory B cells[16] following naturally-acquired immunity.

20. Multiple extensive, peer-reviewed studies comparing natural and vaccine immunity have now been published. These studies overwhelmingly conclude that recovered immunity provides equivalent or greater protection against severe infection than immunity generated by mRNA vaccines (Pfizer and Moderna).

21. Specifically, studies confirm the efficacy of recovered immunity against reinfection of COVID-19[17] and show that the vast majority of reinfections are less severe

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[15] Ripperger, T. J., Uhrlaub, J. E., Watanabe, M., Wong, R., Castaneda, Y., Pizzato, H. A., Thompson, M. R., Bradshaw, C., Weinkauf, C. C., Bime, C., Erickson, H. L., Knox, K., Bixby, B., Parthasarathy, S., Chaudhary, S., Natt, B., Cristan, E., El Aini, T., Rischard, F., Bhattacharya, D. (2020). Orthogonal SARS-CoV-2 serological assays enable surveillance of low-prevalence communities and reveal durable humor immunity. *Immunity*, *53*(5), 925-933. doi: 10.1016/j.immuni.2020.10.004 (study finding that spike and neutralizing antibodies remained detectable 5-7 months after recovering from infection).

[16] Cohen, K. W., Linderman, S. L., Moodie, Z., Czartoski, J., Lai, L., Mantus, G., Norwood, C., Nyhoff, L. E., Edara, V. V., Floyd, K., De Rosa, S. C., Ahmed, H., Whaley, R., Patel, S. N., Prigmore, B., Lemos, M. P., Davis, C. W., Furth, S., O'Keefe, J., McElrath, M. J. (2021). Longitudinal analysis shows durable and broad immune memory after SARS-CoV-2 infection with persisting antibody responses and memory B and T cells. *medRxiv*, Preprint. (study of 254 recovered COVID patients over 8 months "found a predominant broad-based immune memory response" and "sustained IgG+ memory B cell response, which bodes well for rapid antibody response upon virus re-exposure." "Taken together, these results suggest that broad and effective immunity may persist long-term in recovered COVID-19 patients").

[17] Shrestha, N. K., Burke, P. C., Nowacki, A. S., Terpeluk, P. & Gordon, S. M. (2021). Necessity of COVID-19 vaccination in previously infected individuals. *medRxiv*, Preprint. doi: 10.1101/2021.06.01.21258176 ("not one of the 1359 previously infected subjects who remained unvaccinated had a SARS-CoV-2 infection over the duration of the study" and concluded that those with recovered immunity are "unlikely to benefit from COVID-19 vaccination"); Perez, G., Banon, T., Gazit, S., Moshe, S. B., Wortsman, J., Grupel, D., Peretz, A., Tov, A. B., Chodick, G., Mizrahi-Reuveni, M., & Patalon, T. (2021). A 1 to 1000 SARS-CoV-2 reinfection proportion in members of a large healthcare provider in Israel: A preliminary report. *medRxiv*, Preprint. doi: 10.1101/2021.03.06.21253051 (Israeli study finding that approximately 1/1000 of participants were reinfected); Bertollini, R., Chemaitelly, H., Yassine, H. M., Al-Thani, M. H., Al-Khal, A., & Abu-Raddad, L. J. (2021). Associations of vaccination and of prior infection with positive PCR test results for SARS-CoV-2 in airline passengers arriving in Qatar. *JAMA*, *326*(2), 185-188. doi: 10.1001/jama.2021.9970 (study of international airline passengers arriving in Qatar found no statistically significant difference in risk of reinfection between those who had been vaccinated and those who had previously been infected); Pilz, S., Chakeri, A., Ioannidis, J. P. A., Richter, L., Theiler-Schwetz, V., Trummer, C., Krause, R., Allerberger, F. (2021). SARS-CoV-2 re-infection risk in Austria. *European Journal of Clinical Investigation*, *51*(4), 1-7. doi: 10.1111/eci.13520 (previous SARS-CoV-2 infection reduced the odds of re-infection by 91% compared to first infection in the remaining general population); Breathnach, A. S., Duncan, C. J. A., El Bouzidi, K., Hanrath, A. T., Payne, B. A. I., Randell, P. A., Habibi, M. S., Riley, P. A., Planche, T. D., Busby, J. S., Sudhanva, M., Pallett, S. J. C. & Kelleher, W. P. (2021). Prior COVID-19 protects against reinfection, even in the absence of detectable antibodies. *The Journal of*

than first-time infections.[18] For example, an Israeli study of approximately 6.4 million individuals demonstrated that recovered immunity provided equivalent if not better protection than vaccine immunity in preventing COVID-19 infection, morbidity, and mortality.[19] Of the 187,549 unvaccinated persons with recovered immunity in the study, only 894 (0.48%) were reinfected; 38 (0.02%) were hospitalized, and 16 (0.008%) were hospitalized with severe disease, and only one died, an individual over 80 years of age.

Infection, *83*(2), 237-279. doi: 10.1016/j.jinf.2021.05.024 (0.86% of previously infected population in London became reinfected); Tarke, A., Sidney, J., Methot, N., Yu, E. D., Zhang, Y., Dan, J. M., Goodwin, B., Rubiro, P., Sutherland, A., Wang, E., Frazier, A., Ramirez, S. I., Rawlings, S. A., Smith, D. M., da Silva Antunes, R., Peters, B., Scheuermann, R. H., Weiskopf, D., Crotty, S., Grifoni, A. & Sette, A. (2021). Impact of SARS-CoV-2 variants on the total $CD4^+$ and $CD8^+$ T cell reactivity in infected or vaccinated individuals, *Cell Reports Medicine 2*(7), 100355 (an examination of the comparative efficacy of T cell responses to existing variants from patients with recovered immunity compared to those who received an mRNA vaccine found that the T cell responses of both recovered COVID patients and vaccines were effective at neutralizing mutations found in SARS-CoV-2 variants).

[18] Abu-Raddad, L. J., Chemaitelly, H., Coyle, P., Malek, J. A., Ahmed, A. A., Mohamoud, Y. A., Younuskunju, S., Ayoub, H. H., Kanaani, Z. A., Kuwari, E. A., Butt, A. A., Jeremijenko, A., Kaleeckal, A. H., Latif, A. N., Shaik, R. M., Rahim, H. F. A., Nasrallah, G. K., Yassine, H. M., Al Kuwari, M. G., Al Romaihi, H. E., Al-Thani, M. H., Al Khal, A., Bertollini, R. (2021). SARS-CoV-2 antibody-positivity protects against reinfection for at least seven months with 95% efficacy. *EClinicalMedicine*, *35*, 1-12. doi: 10.1016/j.eclinm.2021.100861 (finding that of 129 reinfections from a cohort of 43,044, only one reinfection was severe, two were moderate, and none were critical or fatal); Hall, V. J., Foulkes, S., Charlett, A., Atti, A., Monk, E. J. M., Simmons, R., Wellington, E., Cole, M. J., Saei, A., Oguti, B., Munro, K., Wallace, S., Kirwan, P. D., Shroti, M., Vusirikala, A., Rokadiya, S., Kall, M., Zambon, M., Ramsay, M., Hopkins, S. (2021). SARS-CoV-2 infection rates of antibody-positive compared with antibody-negative health-care workers in England: a large, multicentre, prospective cohort study. *The Lancet*, *397*(10283), 1459-1469. doi: 10.1016/S0140-6736(21)00675-9 (finding "a 93% lower risk of COVID-19 symptomatic infection… [which] show[s] equal or higher protection from natural infection, both for symptomatic and asymptomaticinfection"); Hanrath, A. T., Payne, B., A., I., & Duncan, C. J. A. (2021). Prior SARS-CoV-2 infection is associated with protection against symptomatic reinfection. *The Journal of Infection*, *82*(4), e29-e30. doi: 10.1016/j.jinf.2020.12.023 (examined reinfection rates in a cohort of healthcare workers and found "no symptomatic reinfections" among those examined and that protection lasted for at least 6 months).

[19] Goldberg, Y., Mandel, M., Woodbridge, Y., Fluss, R., Novikov, I., Yaari, R., Ziv, A., Freedman, L., & Huppert, A. (2021). Protection of previous SARS-CoV-2 infection is similar to that of BNT162b2.vaccine protection: A three-month nationwide experience from Israel. *medRxiv*, Preprint. doi: 10.1101/2021.04.20.21255670

Another study analyzing data from Italy found that only 0.31% of COVID-recovered patients experienced reinfection within a year after the initial infection.[20]

22. Before the emergence of the Omicron variant, variants did not escape the immunity against infection provided by prior infection or vaccination.[21] [22] In a study of a large population of patients in Israel, *vaccinated* people who had not been previously infected had 13 times higher odds of experiencing a breakthrough infection with the Delta variant than patients who had recovered from COVID but were never vaccinated.[23] They had 27 times higher odds of experiencing subsequent symptomatic COVID disease and seven times higher odds of hospitalization. The design of this Israeli study was particularly strong – it tracked large cohorts of people over time from the time of vaccination or initial infection and thus carefully distinguished the effect of time since initial exposure or vaccination in estimating its effect estimates. This is important because both vaccine-mediated and infection-mediated protection against subsequent infection diminish with time.

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[20] Vitale, J., Mumoli, N., Clerici, P., de Paschale, M., Evangelista, I., Cei, M. & Mazzone, A. (2021). Assessment of SARS-CoV-2 reinfection 1 year after primary infection in a population in Lombardy, Italy. *JAMA Internal Medicine*, *181*(10), 1407-1409. doi: 10.1001/jamainternmed.2021.2959

[21] Tarke, A., Sidney, J., Methot, N., Yu, E. D., Zhang, Y., Dan, J. M., Goodwin, B., Rubiro, P., Sutherland, A., Wang, E., Frazier, A., Ramirez, S. I., Rawlings, S. A., Smith, D. M., da Silva Antunes, R., Peters, B., Scheuermann, R. H., Weiskopf, D., Crotty, S., Grifoni, A. & Sette, A. (2021). Impact of SARS-CoV-2 variants on the total $CD4^+$ and $CD8^+$ T cell reactivity in infected or vaccinated individuals, *Cell Reports Medicine 2,* 100355.

[22] Wu, K., Werner, A. P., Moliva, J. I., Koch, M., Choi, A., Stewart-Jones, G. B. E., Bennett, H., Boyoglu-Barnum, S., Shi, W., Graham, B. S., Carfi, A., Corbett, K. S., Seder, R. A. & Edwards, D. K. (2021). mRNA-1273 vaccine induces neutralizing antibodies against spike mutants from global SARS-CoV-2 variants. *bioRxiv*, Preprint. doi: 10.1101/2021.01.25.427948

[23] Gazit, S., Shlezinger, R., Perez, G., Lotan, R., Peretz, A., Ben-Tov, A., Cohen, D., Muhsen, K., Chodick, G. & Patalon, T. (2021). Comparing SARS-CoV-2 recovered immunity to vaccine-induced immunity: Reinfections versus breakthrough infections. *medRxiv*, Preprint. doi: 10.1101/2021.08.24.21262415

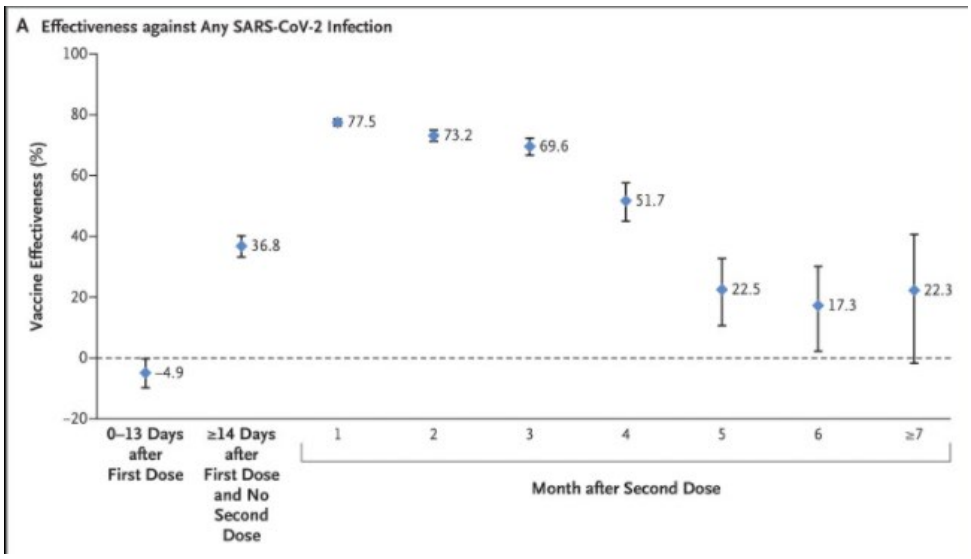
23. In summary, the overwhelming conclusion of the pertinent scientific literature is that recovered immunity is at least as effective against subsequent reinfection as even the most effective vaccines.

24. In contrast to the concrete findings regarding the robust durability of recovered immunity, the immunity provided by vaccination against infection appears to be short-lived, especially in the Omicron era.

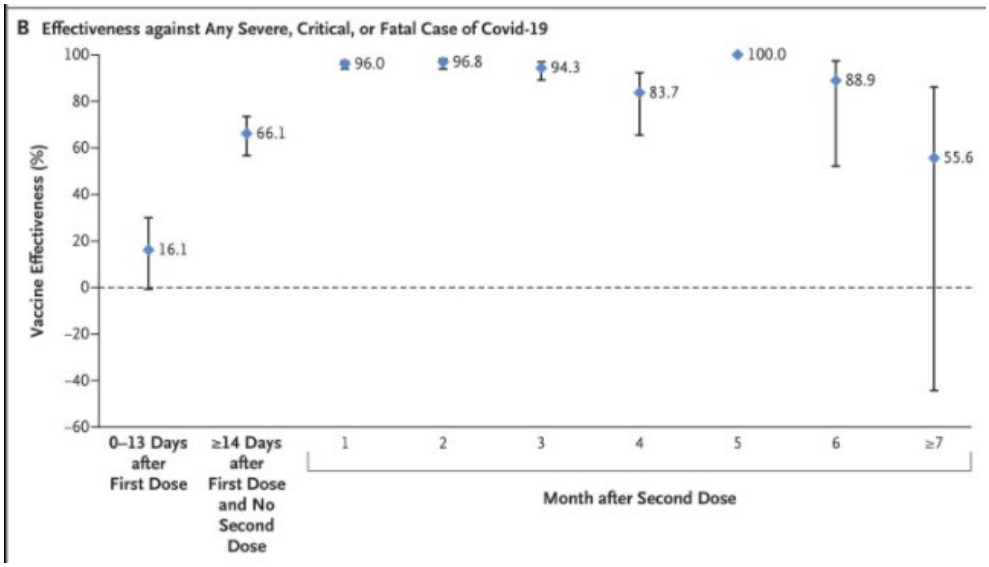
25. A study from Qatar by Chemaitelly and colleagues (recently published in the New England Journal of Medicine), which tracked 927,321 individuals for six months after vaccination, concluded that the Pfizer vaccine's "induced protection against infection appears to wane rapidly after its peak right after the second dose, but it persists at a robust level against hospitalization and death for at least six months following the second dose."[24]

26. The key figures from the Qatari study are reproduced immediately below. Panel A shows that vaccine-mediated protection against infection peaks at 77.5% one month after the second dose, and then declines to 22.5%, five months after the second dose. According to this result, vaccines effectively protect against infection (and therefore disease spread) for a short period of time after the second dose of the mRNA vaccines.

[24] Chemaitelly H, Tang P, Hasan MR, AlMukdad S, Yassine HM, Benslimane FM, Al Khatib HA, Coyle P, Ayoub HH, Al Kanaani Z, Al Kuwari E, Jeremijenko A, Kaleeckal AH, Latif AN, Shaik RM, Abdul Rahim HF, Nasrallah GK, Al Kuwari MG, Al Romaihi HE, Butt AA, Al-Thani MH, Al Khal A, Bertollini R, Abu-Raddad LJ. Waning of BNT162b2 Vaccine Protection against SARS-CoV-2 Infection in Qatar. N Engl J Med. 2021 Oct 6:NEJMoa2114114. doi: 10.1056/NEJMoa2114114. Epub ahead of print. PMID: 34614327; PMCID: PMC8522799.

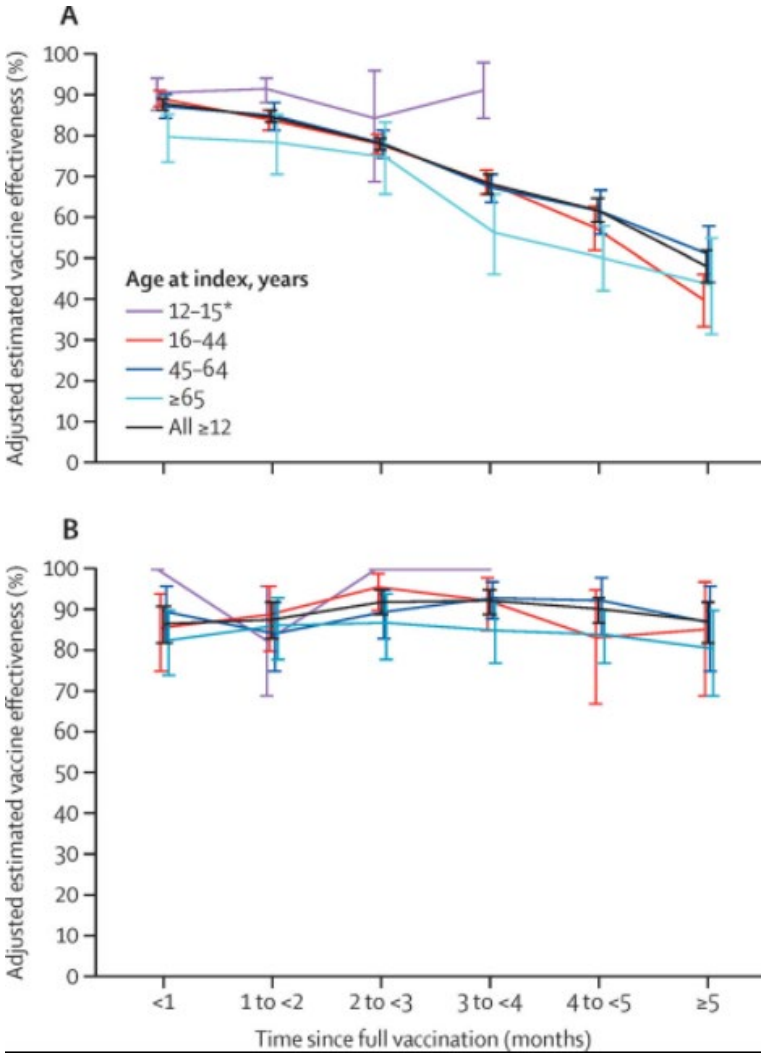


27. On the other hand, Panel B shows that protection versus severe disease is long lasting after vaccination—even though the person will no longer be fully protected against infection and, presumably, disease spread. At six months after the second dose, the vaccine remains 88.9% efficacious versus severe disease. While it appears to dip at seven months to 55.6% efficacy, the confidence interval is so wide that it is consistent with no decrease whatsoever even after seven months.



28. The Qatari study is no outlier. A large study in California tracked the infection rates for nearly 5 million patients vaccinated with two doses of the Pfizer mRNA vaccine. The study tracked both SARS-CoV-2 infections as well as COVID-19 related hospitalizations. The figure immediately below plots the trend in vaccine efficacy over time for different age groups in the population cohort. **Panel A** on the right plots effectiveness versus SARS-CoV-2 *infections*.[25] Though the drop in effectiveness is not as steep as in the Qatari study, there is, nevertheless, a sharp drop. While in the first month, vaccine effectiveness is near 90% for all age-groups, by month 5, it drops to nearly 50% for all the groups. By contrast, **Panel B** plots vaccine efficacy versus *hospitalizations*. It remains high with no decline over time –near 90% throughout the period. The vaccine provides durable private protection versus severe disease, but declining protection versus infection (and hence transmission).

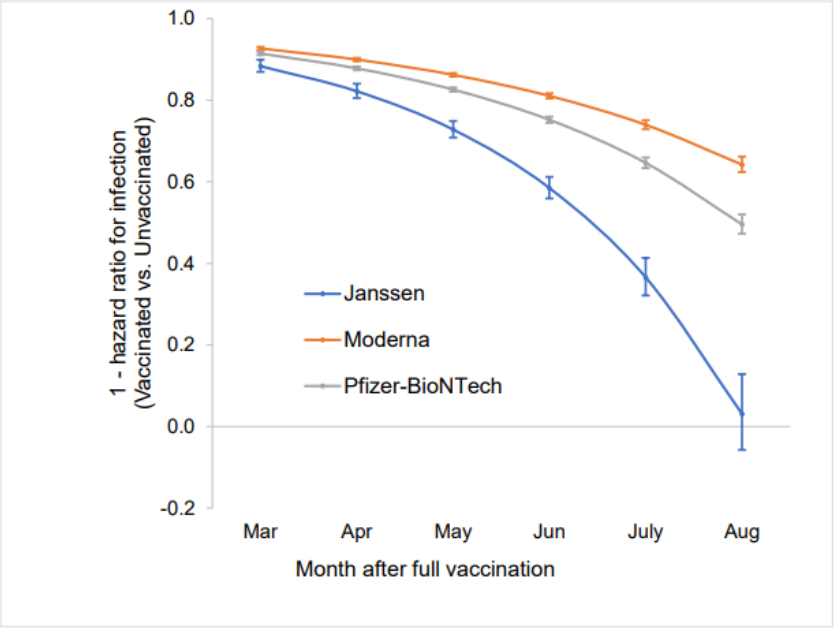
[25] Tartof SY, Slezak JM, Fischer H, Hong V, Ackerson BK, Ranasinghe ON, Frankland TB, Ogun OA, Zamparo JM, Gray S, Valluri SR, Pan K, Angulo FJ, Jodar L, McLaughlin JM. Effectiveness of mRNA BNT162b2 COVID-19 vaccine up to 6 months in a large integrated health system in the USA: a retrospective cohort study. *Lancet*. 2021 Oct 16;398(10309):1407-1416. doi: 10.1016/S0140-6736(21)02183-8. Epub 2021 Oct 4. PMID: 34619098; PMCID: PMC8489881.



29. Another recent study tracked 620,000 vaccinated U.S. veterans to measure breakthrough infections for the three vaccines in common use in the U.S.[26] Like the other studies, the authors of the study found a sharp decline in vaccine effectiveness versus infection. Five months after vaccination, the effectiveness of the J&J vaccine dropped from ~90% to less than 10%; the Pfizer vaccine dropped from ~90% to ~50%; and the Moderna dropped from ~90% to ~65%. The figure on this page tracks the decline in effectiveness of the vaccines against infection over time documented in this study. This study corroborates

[26] Cohn BA, Cirillo PM, Murphy CC, et al. Breakthrough SARS-CoV-2 Infections in 620,000 U.S. Veterans, February 1, 2021 to August 13, 2021. medRxiv. October 14, 2021. https://doi.org/10.1101/2021.10.13.21264966;

yet another study that documented declining vaccine efficacy in the first three months after vaccination against disease transmission in the era of the Delta variant.[27]



30. Yet another study conducted in Wisconsin confirmed that vaccinated individuals can shed infectious SARS-CoV-2 viral particles.[28] The authors analyzed nasopharyngeal samples to check whether patients showed evidence of infectious viral particles. They found that vaccinated individuals were at least as likely as unvaccinated individuals to be shedding live virus. They concluded:

> Combined with other studies these data indicate that vaccinated and unvaccinated individuals infected with the Delta variant might transmit infection. Importantly, we show that infectious SARS-CoV-2 is frequently found even in vaccinated persons.

[27] Eyre, D. W., Taylor, D., Purver, M., Chapman, D., Fowler, T., Pouwels, K. B., Walker, A. S. & Peto, T. E. A. (2021). The impact of SARS-CoV-2 vaccination on Alpha & Delta variant transmission. *medRxiv*, Preprint. doi: 10.1101/2021.09.28.21264260

[28] Riemersma, K. K., Grogan, B. E., Kita-Yarbro, A., Halfmann, P. J., Segaloff, H. E., Kocharian, A., Florek, K. R., Westergaard, R., Bateman, A., Jeppson, G. E., Kawaoka, Y., O'Connor, D. H., Friedrich, T. C., & Grande, K. M. (2021). Shedding of infectious SARS-CoV-2 despite vaccination. *medRxiv*, Preprint. doi: 10.1101/2021.07.31.21261387

31. A study in the U.K. during its wave of delta COVID cases compared the likelihood of a vaccinated individual passing on the disease to someone within their same household relative to unvaccinated patients.[29] This study tracked these groups of patients over time to the point they tested positive for COVID. At that point, study investigators measured levels of the SARS-CoV-2 virus in the patients, and observed whether the patients passed on the disease to other household members. The authors find that while vaccination does reduce the fraction of time that a patient passes the disease on to household members from 38% [95% confidence interval: 24-53] to 25% [95% confidence interval: 18-33], there was no statistically significant difference (p=0.17). They conclude:

> Vaccination reduces the risk of delta variant infection and accelerates viral clearance. Nonetheless, fully vaccinated individuals with breakthrough infections have peak viral load similar to unvaccinated cases and can efficiently transmit infection in household settings, including to fully vaccinated contacts.

32. The CDC recognizes the importance of recovered immunity in its updated science brief analyzing the difference in immunity from infection-induced and vaccine-induced immunity.[30] The CDC noted that "confirmed SARS-CoV-2 infection decreased risk of subsequent infection by 80–93% for at least 6–9 months," with some studies showing "slightly higher protective effects (89-93%)." It also noted that "researchers have predicted that the immune response following infection would continue to provide at least 50% protection against reinfection for 1–2 years following initial infection with SARS-

[29] Singanayagam A, Hakki S, Dunning J, et al. Community transmission and viral load kinetics of the SARS-CoV-2 delta (B.1.617.2) variant in vaccinated and unvaccinated individuals in the UK: a prospective, longitudinal, cohort study [published online ahead of print, 2021 Oct 29]. Lancet Infect Dis. 2021;doi:10.1016/S1473-3099(21)00648-4

[30] CDC, Science Brief: SARS-CoV-2 Infection-Induced and Vaccine-Induced Immunity (updated Oct. 29, 2021), https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/vaccine-induced-immunity.html#anchor_1635539757101

CoV-2 or vaccination. This would be similar to what is observed with seasonal coronaviruses."

33. The CDC science brief does claim that vaccine-induced immunity is stronger than immunity from natural infection.[31] The study the CDC relies on to support this claim is not determinative, however, for several reasons.[32] First, its result is contrary to the weight of other evidence, as set forth above. Second, the study compared hospitalization of those infected—and had recovered immunity—90-225 days after their infection while against those who had completed their RNA vaccine regime 45-213 days before reinfection. Because immunity—regardless of how gained—wanes over time, the failure to adequately compare like periods means that the study's conclusions are biased in favor of vaccine-induced immunity. Indeed, the study admits this weakness. Third, the study design itself does not permit it to address the critical question of interest – whether COVID-recovery without vaccination or vaccination without COVID-recovery provides stronger protection against COVID-related hospitalization. The study analyzes only patients who are already in the hospital. To obtain an accurate answer to the question of interest, it would need to include and analyze patients before entering the hospital. As it is, the study implicitly and incorrectly assumes that the set of hospitalized patients with COVID-like symptoms is representative of the population at large, which is untrue.

34. In summary, the evidence to date strongly suggests that, while vaccines—like recovered immunity—protect against severe disease, they, unlike recovered immunity,

[31] *Id.*

[32] Bozio CH, Grannis SJ, Naleway AL, et al. Laboratory-Confirmed COVID-19 Among Adults Hospitalized with COVID-19–Like Illness with Infection-Induced or mRNA Vaccine-Induced SARS-CoV-2 Immunity — Nine States, January–September 2021. MMWR Morb Mortal Wkly Rep. ePub: 29 October 2021.

provide only short-lasting protection against subsequent infection and disease spread. In short, there is no medical or scientific reason to believe that vaccine immunity will prove longer-lasting immunity than recovered immunity, much less more durable immunity.

35. The United States government is an outlier relative to other developed countries in its refusal to recognize the efficacy of recovered immunity. For instance, the Netherlands recently extended the duration of its "recovered immunity certificate," which can be used in lieu of a vaccine passport from 180 days to 365 days.[33] A similar exemption was made for recovered immunity in vaccine passports in the U.K. when the country required them.[34]

III. OMICRON DOES NOT PRESENT A GRAVE DANGER

36. The Omicron variant now represents substantially all new SARS-COV2 infections in the United States. This fact renders any remaining basis for a vaccine mandate obsolete.

37. An analysis from the South African government's National Institute for Communicable Diseases provides reason for optimism: S-Gene Target Failure (presumptive Omicron) cases are 80% less likely to be hospitalized.[35]

Table 1. Multivariable logistic regression analysis evaluating the association between S gene target failure (SGTF) infection, compared to non-SGTF infection, and hospitalisation, South Africa, 1 October – 30 November 2021[a] (N=11,255)

		Hospital admission[b] n/N (%)	Adjusted odds ratio (95% CI)	P-value
SARS-CoV-2 variant		N=11,495		
	SGTF	256/10,547 (2)	0.2 (0.1-0.3)	**<0.001**
	Non-SGTF	121/948 (13)	Ref	-

[33] Block J. Vaccinating people who have had covid-19: why doesn't recovered immunity count in the US? BMJ. 2021 Sep 13;374:n2101. doi: 10.1136/bmj.n2101. Erratum in: BMJ. 2021 Sep 15;374:n2272. PMID: 34518194.

[34] Diver T. Vaccine passports will show 'recovered immunity' for people who have had Covid. MSN News. June 6, 2021.

[35] https://www.medrxiv.org/content/10.1101/2021.12.21.21268116v1.full.pdf

38. Data from Scotland also strongly suggests the same optimistic conclusion: "early national data suggest that Omicron is associated with a two-thirds reduction in the risk of COVID-19 hospitalisation when compared to Delta."[36]

Table 3: Observed vs expected analysis for risk of hospital admission by S gene status

Omicron — Risk of hosp 68% lower controlling for vax, reinfections)

	S Gene Status	N	Person Years	Hospital Admissions	Expected Admissions	Observed/ Expected	LCL	UCL
All cases linking into the EAVE II dataset	S Positive	119100	4375.1	856	856.9	1	0.93	1.07
	S Negative	22205	413.4	15	46.6	0.32	0.19	0.52
	Weak S Positive	2199	57.3	7	6.9	1.02	0.45	2
	Other	990	33.8	*	*	0.79	0.26	1.88
	Unknown	1647	58.2	14	14.8	0.94	0.54	1.54

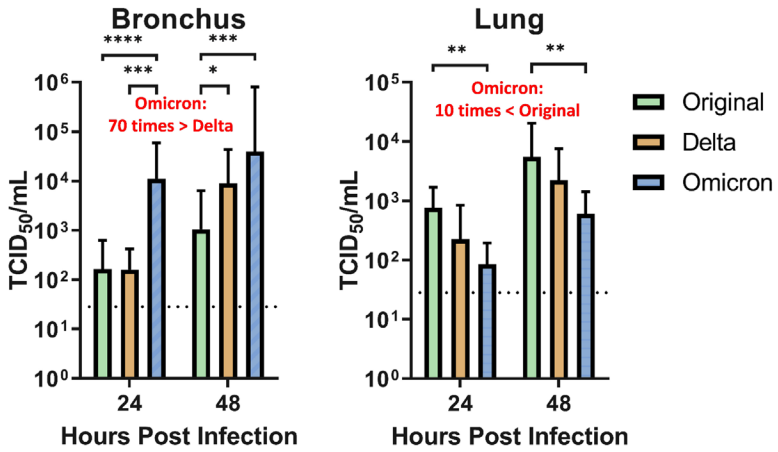
39. Denmark's data shows Omicron cases were three times less likely to end up with hospital admissions than the previous dominant variant, Delta.[37]

40. Hong Kong University researchers pointed to the likely reason, or mechanism, for Omicron's increased infectiousness but reduced virulence: it replicates far more efficiently in the bronchus and upper respiratory tract than Delta, but less efficiently in the lungs:[38]

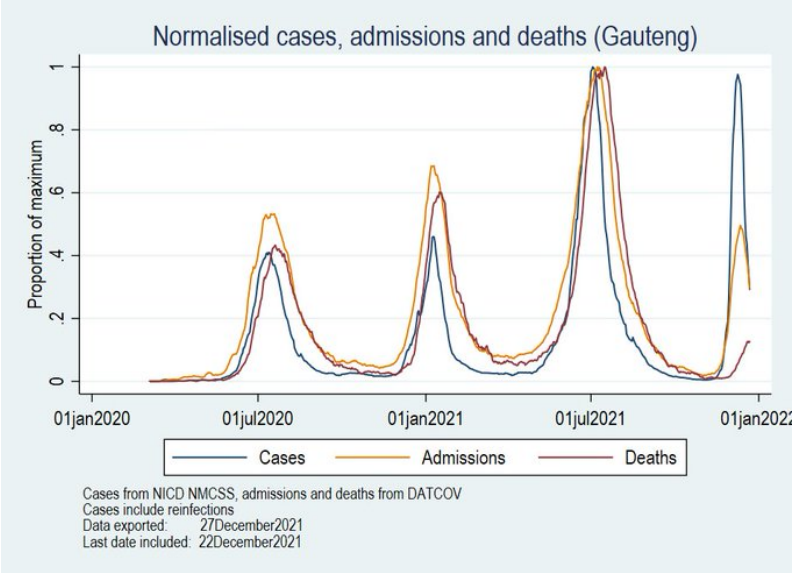
[36] https://www.research.ed.ac.uk/en/publications/severity-of-omicron-variant-of-concern-and-vaccine-effectiveness-

[37] https://arstechnica.com/science/2021/12/omicron-cases-less-likely-to-require-hospital-treatment-studies-show/

[38] http://www.med.hku.hk/en/news/press/20211215-omicron-sars-cov-2-infection



41. Compelling evidence of Omicron ending any grave danger from SARS-CoV2 comes from South Africa, particularly the Gauteng province (population 18 million) where the first recognized Omicron wave occurred. According to Dr. Harry Moultrie of the South African government's National Institute for Communicable Diseases, Gauteng cases peaked on December 9 at 97 percent of the delta wave. Even more reassuringly, deaths were only 13 percent of the delta peak:[39]



[39] https://twitter.com/hivepi/status/1475383429403484163

42. A recently published working paper by a South African team of scientists who were conducting a sero-epidemiological survey in the Gautang Province confirms the conclusion that Omicron infection is substantially less likely to require hospitalization or induce mortality than infection with other strains. While cases may rise sharply as a wave of Omicron sweeps through a region, hospitalizations and deaths do not follow. The authors conclude:[40]

> "We demonstrate widespread underlying SARS-CoV-2 seropositivity in Gauteng Province prior to the current Omicron-dominant wave, with epidemiological data showing an uncoupling of hospitalization and death rates from infection rate during Omicron circulation."

43. Based on their Omicron experience, some South African scientists have effectively declared the pandemic over, stating:[41]

> "All indicators suggest the country may have passed the peak of the fourth wave at a national level… While the Omicron variant is highly transmissible, there has been lower rates of hospitalisation than in previous waves. This means that the country has a spare capacity for admission of patients even for routine health services."

44. In other words, the first country to experience an Omicron wave unambiguously concluded that the dominant variant presents no grave danger.

45. Early U.S. data was available in a preprint from a team at Case Western Reserve University, which used propensity matched-cohort analysis to find markedly reduced disease severity during the period from December 14 to December 24, 2021. On an age and risk-matched basis, they found E.R. visits were 70% lower than earlier cohorts,

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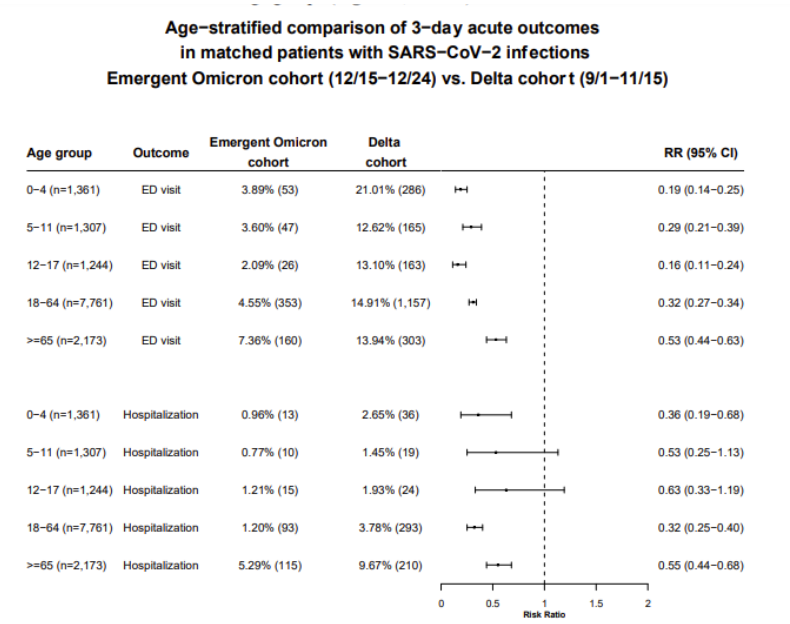
[40] Shabir A. Madhi, Gaurav Kwatra, Jonathan E. Myers, Waasila Jassat, Nisha Dhar, Christian K. Mukendi, Amit J. Nana, Lucille Blumberg, Richard Welch, Nicoletta Ngorima-Mabhena, Portia C. Mutevedzi (2021) *South African Population Immunity and Severe Covid-19 with Omicron Variant*. medRxiv 2021.12.20.21268096; doi: https://doi.org/10.1101/2021.12.20.21268096

[41] https://sacoronavirus.co.za/2021/12/30/media-release-cabinet-approves-changes-to-covid-19-regulations/

hospitalizations were 56% lower, ICU admissions were 67% lower, and ventilation were 84% lower.



46. As good as they appear, these reductions substantially *understate* the reduction of risk represented by Omicron, because this cohort included a non-negligible number of Delta infections. According to the authors:

> "The estimated prevalence of the Omicron variant during 12/15-12/24 was only 22.5-58.6%, suggesting that the outcomes for the Omicron variant may be found to be even milder than what we report here as the prevalence of the Omicron variant increases."

47. Quite simply, the Omicron variant is now a *normal respiratory virus,* not an unusual, extraordinary, or grave danger. There is no evidence specific to Omicron to support a grave danger finding.

IV. VACCINES ARE INEFFECTIVE AT PREVENTING OMICRON INFECTIONS

48. Pfizer and BioNTech are the manufacturers of the current leading vaccine. They recently admitted that the existing vaccine does not provide robust protection against Omicron, saying:

> "Sera from individuals who received two doses of the current COVID-19 vaccine did exhibit, on average, more than a 25-fold reduction in neutralization titers against the Omicron variant compared to wild-type, indicating that two doses of BNT162b2 may not be sufficient to protect against infection with the Omicron variant."[42]

49. Moderna, the second-leading manufacturer, similarly admitted that its vaccine does not provide acceptable efficacy against Omicron, stating:

> "All groups had low neutralizing antibody levels in the Omicron PsVNT assay prior to boosting."[43]

50. Similarly, NIH-funded researchers at Duke university found in vitro that: "neutralizing titers to Omicron are 49-84 times lower than neutralization titers to D614G [wild-type SARS-CoV2] after 2 doses of mRNA-1273 [Moderna], which could lead to an increased risk of symptomatic breakthrough infections."[44]

51. Real-world evidence from at least four countries with significant experience with Omicron — Denmark, the United Kingdom, Germany, and Canada, all of which provide more detailed and transparent data than has been made available in the United States — evidences that these vaccines have *substantially zero efficacy* at preventing

[42] https://www.pfizer.com/news/press-release/press-release-detail/pfizer-and-biontech-provide-update-omicron-variant

[43] https://investors.modernatx.com/news/news-details/2021/Moderna-Announces-Preliminary-Booster-Data-and-Updates-Strategy-to-Address-Omicron-Variant/default.aspx

[44] https://www.medrxiv.org/content/10.1101/2021.12.15.21267805v1.full-text

Omicron transmission, undermining the central rationale for mandating them in the workplace.

52. The Statens Serum Institut in Copenhagen, Denmark analyzed Danish data and found vaccine efficacy turned *negative* after 91 days following the second dose was administered. In other words, vaccinated Danes were *even more likely* than unvaccinated Danes to be infected with Omicron after 3 months.[45] This may be due to unvaccinated, COVID-recovered patients having better[46] protection versus Omicron than vaccinated patients who never previously had COVID.

[45] https://www.medrxiv.org/content/10.1101/2021.12.20.21267966v2.full.pdf

[46] Sivan Gazit, Roei Shlezinger, Galit Perez, Roni Lotan, Asaf Peretz, Amir Ben-Tov, Dani Cohen, Khitam Muhsen, Gabriel Chodick, Tal Patalon (2021) *Comparing SARS-CoV-2 recovered immunity to vaccine-induced immunity: reinfections versus breakthrough infections*, medRxiv 2021.08.24.21262415; doi: https://doi.org/10.1101/2021.08.24.21262415

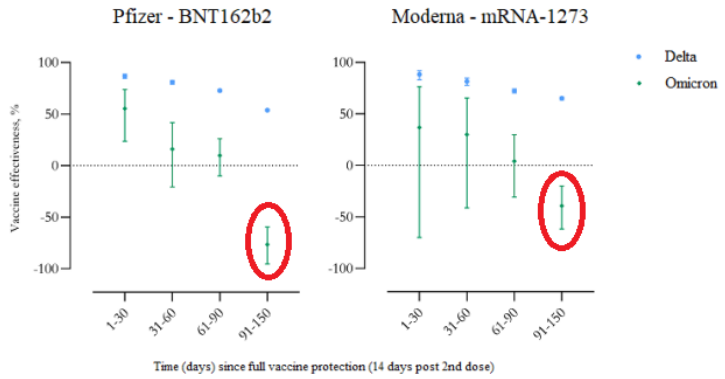


Figure Vaccine effectiveness against SARS-CoV-2 infection with the Delta and Omicron variants, shown separately for the BNT162b2 and mRNA-1273 vaccines. Vertical bars indicate 95% confidence intervals.

Table Estimated vaccine effectiveness for BNT162b2 and mRNA-1273 against infection with the SARS-CoV-2 Omicron and Delta variants during November 20 – December 12, 2021, Denmark.

	Pfizer – BNT162b2				Moderna - mRNA-1273			
Time since vaccine protection	Omicron		Delta		Omicron		Delta	
	Cases	VE, % |95% CI|	Cases	VE, % |95% CI|	Cases	VE, % |95% CI|	Cases	VE, % |95% CI|
1-30 days	14	55.2 |23.5; 73.7|	171	86.7 |84.6; 88.6|	4	36.7 |-69.9; 76.4|	29	88.2 |83.1; 91.8|
31-60 days	32	16.1 |-20.8; 41.7|	454	80.9 |79.0; 82.6|	8	30.0 |-41.3; 65.4|	116	81.5 |77.7; 84.6|
61-90 days	145	9.8 |-10.0; 26.1|	3,177	72.8 |71.7; 73.8|	48	4.2 |-30.8; 29.8|	1,037	72.2 |70.4; 74.0|
91-150 days	2,851	-76.5 |-95.3;-59.5|	34,947	53.8 |52.9; 54.6|	393	-39.3 |-61.6;-20.0|	3,459	65.0 |63.6; 66.3|
1-30 days after booster vaccination protection	29	54.6 |30.4; 70.4|	453	81.2 |79.2; 82.9|	-	-	5	82.8 |58.8; 92.9|

CI = confidence intervals; VE = vaccine effectiveness. VE estimates adjusted for 10-year age groups, sex and region (five geographical regions). Vaccine protection was assumed 14 days post 2nd dose. Insufficient data to estimate mRNA-1273 booster VE against Omicron.

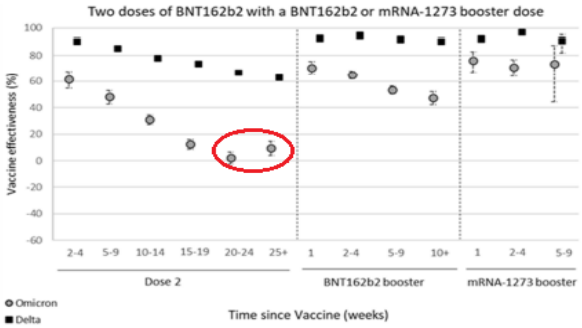
53. In Germany, the most recent detailed report from the Robert Koch Institute (the German equivalent of the CDC) found that 78.6 percent (4,020 of 5,117) of sequenced Omicron cases were in *vaccinated* Germans,[47] despite a population vaccination rate of just 70 percent.[48]

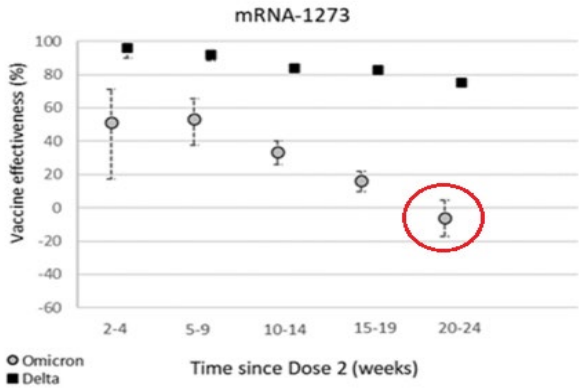
54. In the United Kingdom, the U.K. Health Security Agency calculated preliminary vaccine effectiveness estimates remarkably like the Danish findings, with

47 https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Situationsberichte/Wochenbericht/Wochenbericht_2021-12-30.pdf?__blob=publicationFile

48 https://ourworldindata.org/covid-vaccinations

near-zero vaccine efficacy for both Pfizer-BioNTech and Moderna vaccines after 20 weeks following the second dose:[49]

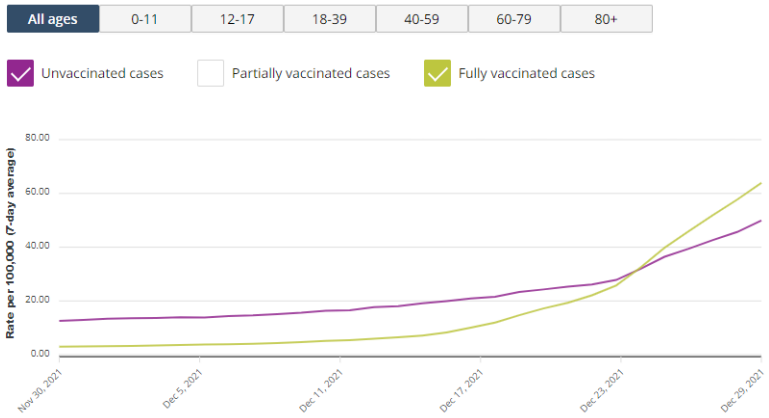




55. Although the U.K. Health Security Agency clarifies "[t]hese results should be interpreted with caution due to the low counts and the possible biases related to the populations with highest exposure to Omicron (including travelers and their close contacts) which cannot fully be accounted for," these results are consistent with the epidemiological patterns we are seeing in the United States and globally.

49 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1043807/technical-briefing-33.pdf

56. In Ontario, Canada, the case rate per 100,000 fully *vaccinated* Ontarians has risen sharply above the case rate per 100,000 unvaccinated Ontarians, again suggesting *negative vaccine efficacy*:[50]



57. A test-negative control analysis of Ontario test data by researchers from Public Health Ontario and leading Canadian universities found: "observed *negative* VE against Omicron among those who had received 2 doses compared to unvaccinated individuals" (emphasis added).

58. As the following table shows, the Ontario researchers found that after day 60 following the second dose, vaccine effectiveness was *negative*, meaning a vaccinated person was *more likely* to be infected than an unvaccinated person:

Table 2. Vaccine effectiveness against infection by Omicron or Delta among adults aged ≥18 years by time since latest dose

Doses	Vaccine products	Days since latest dose	SARS-CoV-2 negative controls, n	Omicron-positive cases, n	Vaccine effectiveness against Omicron (95% CI)	Delta-positive cases, n	Vaccine effectiveness against Delta (95% CI)
First 2 doses	≥1 mRNA vaccine	7-59	14,288	63	6 (-25, 30)	204	84 (81, 86)
		60-119	34,741	214	-13 (-38, 8)	562	81 (79, 82)
		120-179	282,977	2,257	-38 (-61, -18)	4,342	80 (79, 81)
		180-239	47,282	522	-42 (-69, -19)	635	74 (72, 76)
		≥240	10,285	46	-16 (-62, 17)	203	71 (66, 75)
Third dose	Any mRNA vaccine	0-6	10,208	50	2 (-35, 29)	71	88 (85, 90)
		≥7	36,500	114	37 (19, 50)	138	93 (92, 94)
	BNT162b2	0-6	8,461	42	2 (-39, 30)	64	87 (83, 90)
		≥7	30,269	106	34 (16, 49)	116	93 (91, 94)
	mRNA-1273	0-6	1,747	8	5 (-94, 54)	7	93 (86, 97)
		≥7	6,231	8	59 (16, 80)	22	93 (90, 96)

[50] https://covid-19.ontario.ca/data/case-numbers-and-spread

59. In the United States, studies and data from last summer showing higher viral transmission in less vaccinated southern states is now completely obsolete. As the following CDC table demonstrates, in the Omicron wave there is no observable reduction in case rates based on vaccination rates:[51]

Difference in Cases in the Month of December: Most Vaccinated States Compared to Least Vaccinated

	Cases in December			
State	2021	2020	Difference	Fully Vaccinated
Vermont	11,120	2,932	279%	77.4%
Rhode Island	34,434	32,625	6%	76.5%
Maine	25,029	12,225	105%	75.8%
Connecticut	80,792	68,413	18%	74.6%
Massachusetts	176,728	149,046	19%	74.6%
New York	645,476	332,116	94%	71.8%
New Jersey	242,649	160,001	52%	70.5%
Maryland	113,299	79,084	43%	70.4%
Virginia	129,377	114,703	13%	68.0%
Washington	67,731	76,819	-12%	67.9%
Dist. Columbia	25,133	7,431	238%	67.6%
New Hampshire	35,412	23,034	54%	67.2%
Oregon	27,234	38,478	-29%	66.5%
New Mexico	33,567	45,769	-27%	66.2%
Colorado	80,691	100,744	-20%	66.2%
California	308,923	1,018,584	-70%	66.1%
Minnesota	103,065	96,539	7%	65.4%
MOST VACCINATED STATES			45%	70.2%

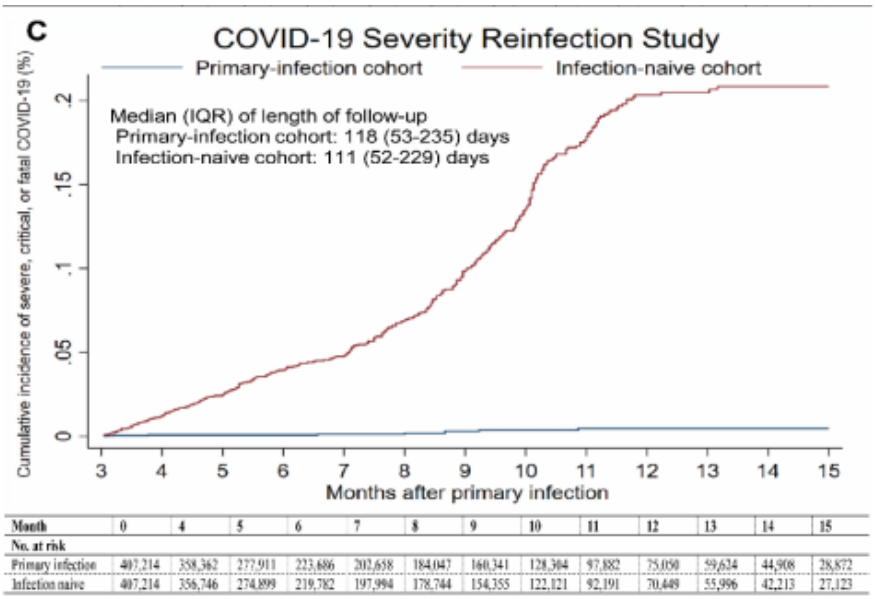
	Cases in December			
State	2021	2020	Difference	Fully Vaccinated
Ohio	281,594	279,317	1%	55.2%
West Virginia	30,720	37,492	-18%	55.1%
Kentucky	66,912	88,994	-25%	54.2%
Montana	6,049	19,357	-69%	54.0%
Oklahoma	37,452	105,592	-65%	53.5%
South Carolina	47,894	97,200	-51%	53.1%
Missouri	88,356	111,450	-21%	53.0%
North Dakota	10,403	13,115	-21%	52.6%
Indiana	133,734	172,712	-23%	52.0%
Tennessee	82,063	211,266	-61%	51.4%
Arkansas	28,713	67,779	-58%	51.2%
Georgia	127,565	194,889	-35%	51.1%
Louisiana	45,334	82,861	-45%	50.3%
Mississippi	24,681	63,076	-61%	48.1%
Alabama	43,257	111,713	-61%	47.6%
Wyoming	4,153	11,104	-63%	47.5%
Idaho	11,613	39,379	-71%	46.2%
LEAST VACCINATED STATES			-44%	51.5%

60. The published evidence in the Omicron era comparing vaccine-mediated immunity and recovered immunity continues to find that recovered immunity provides good protection versus severe disease on subsequent infection.[52] A pre-print by the same team of Qatari researchers concludes that COVID recovered patients are very unlikely to cause severe disease or death at least 15 months after initial infection in data spanning the Omicron era. The graph below, reproduced from that paper compares the cumulative incidence of severe reinfection in the study of people who had never had COVID versus those with recovered immunity. At 15 months, the likelihood of severe reinfection for the

[51] https://data.cdc.gov/Case-Surveillance/United-States-COVID-19-Cases-and-Deaths-by-State-o/9mfq-cb36
https://covid.cdc.gov/covid-data-tracker/COVIDData/getAjaxData?id=vaccination_data

[52] Altarawneh HN, Chemaitelly H, Ayoub HH, Tang P, Hasan MR, Yassine HM, Al-Khatib HA, Smatti MK, Coyle P, Al-Kanaani Z, Al-Kuwari E, Jeremijenko A, Kaleeckal AH, Latif AN, Shaik RM, Abdul-Rahim HF, Nasrallah GK, Al-Kuwari MG, Butt AA, Al-Romaihi HE, Al-Thani MH, Al-Khal A, Bertollini R, Abu-Raddad LJ. Effects of Previous Infection and Vaccination on Symptomatic Omicron Infections. N Engl J Med. 2022 Jul 7;387(1):21-34. doi: 10.1056/NEJMoa2203965. Epub 2022 Jun 15. PMID: 35704396; PMCID: PMC9258753.

COVID-recovered group was near zero, while those in the "infection-naïve" cohort was 0.2% of the population.[53]



Month	0	4	5	6	7	8	9	10	11	12	13	14	15
No. at risk													
Primary infection	407,214	358,362	277,911	223,686	202,658	184,047	160,341	128,304	97,882	75,050	59,624	44,908	28,872
Infection naive	407,214	356,746	274,899	219,782	197,994	178,744	154,355	122,121	92,191	70,449	55,996	42,213	27,123

V. Conclusion

61. Based on the scientific evidence to date, for most of the population, COVID-19 infection poses less of a mortality risk than seasonal influenza.

62. Based on the scientific evidence to date, vaccines effectively protect against infection (and therefore disease spread) for only a short period of time.

63. Based on the scientific evidence to date, those who have recovered from a SARS-CoV-2 infection possess immunity as robust and durable (or more) as that acquired through vaccination. The existing clinical literature overwhelmingly indicates that the

[53] Chemaitelly H et al. (2022) Duration of immune protection of SARS-CoV-2 natural infection against reinfection in Qatar. *medRxiv*. July 7, 2022. https://www.medrxiv.org/content/10.1101/2022.07.06.22277306v1.full.pdf

protection afforded to the individual and community from recovered immunity is as effective and durable as the efficacy levels of the most effective vaccines to date.

64. Based on my analysis of the existing medical and scientific literature, any policy regarding vaccination that does not recognize recovered immunity is irrational, arbitrary, and counterproductive to community health.[54]

65. Indeed, now that every American adult, teenager, and child six months and above has free access to the vaccines, the case for a vaccine mandate is weaker than it once was. Since the successful vaccination campaign already protects the vast majority of the vulnerable population, the unvaccinated—especially recovered COVID patients—pose a vanishingly small threat to the vaccinated on the margin since such a large portion of that population has already had and recovered from COVID infection. They are protected by an effective vaccine that dramatically reduces the likelihood of hospitalization or death after infections to near zero. At the same time, recovered immunity provides benefits that are at least as strong and may well be stronger than those from vaccines.

66. Since a large fraction of the unvaccinated population of health care staff are COVID recovered and hence pose little to no more risk of transmission of the virus than vaccinated workers, mandatory healthcare staff vaccination, or proof of immunity, does not have an appreciable effect on COVID-19 transmission within the healthcare setting.

67. Substantial new factual developments related to the Omicron variant substantially undermines any possible justification for the vaccine mandates. Even if SARS-CoV-2 did present a grave danger justifying the mandates at the time they were

[54] Bhattacharya, J., Gupta, S. & Kulldorff, M. (2021, June 4). *The beauty of vaccines and recovered immunity*. Smerconish Newsletter. https://www.smerconish.com/exclusive-content/the-beauty-of-vaccines-and-natural-immunity

announced — a highly controversial assertion in its own right — at this time, the Omicron virus that presently dominates the field does not even arguably present a grave danger. Nor could its transmission be substantially reduced through mandatory vaccination even if it did present a grave danger.

68. I declare under penalty of perjury under the laws of the United States of America that, to the best of my knowledge, the foregoing is true and correct.

Executed this 15th day of July, 2022, at Stanford, California.

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RESEARCH INTERESTS

Health economics, health policy, and outcomes research

A. ACADEMIC HISTORY:

Stanford University	A.M., A.B.	1990
Stanford University School of Medicine	M.D.	1997
Stanford University Department of Economics	Ph.D.	2000

B. EMPLOYMENT HISTORY:

2001 – present	Professor (Assistant to Full), Stanford University School of Medicine, Department of Economics (by courtesy)
2013 – present	Senior Fellow, Stanford Institute for Economic Policy Research
2007 – present	Research Associate, Sphere Institute / Acumen LLC
2002 – present	FRF to Research Associate, National Bureau of Economic Research
2021 – present	Senior Fellow (by courtesy), Hoover Institute, Stanford University
2006 – 2008	Research Fellow, Hoover Institution, Stanford University
2014 – 2021	Senior Fellow (by courtesy) Stanford Freeman Spogli Institute
2001 – 2020	Professor (Assistant to Full) Department of Health Research and Policy (by courtesy)
1998 – 2001	Economist (Associate to Full), RAND Corporation
1998 – 2001	Visiting Assistant Professor, UCLA Department of Economics

C. SCHOLARLY PUBLICATIONS:

PEER-REVIEWED ARTICLES (161 total)

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ABSTRACTS (3)

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2. Nguyen C, Hernandez-Boussard T., Davies S, **Bhattacharya J**, Khosla R, Curtin C. *Cleft Palate Surgery: Variables of Quality and Patient Safety*. Presented at the 69th Annual American Cleft-Palate Craniofacial Association (2012). [abstract]
3. Patel MI, Ramirez D, Agajanian R, Bhattacharya J, Milstein A, Bundorf MK. "The effect of a lay health worker-led symptom assessment intervention for patients

on patient-reported outcomes, healthcare use, and total costs." Journal of Clinical Oncology 36(15 Suppl):6502 [abstract]

D. PUBLIC AND PROFESSIONAL SERVICE:

JOURNAL EDITING

Journal of Human Capital, Associate Editor (2015-present)
American Journal of Managed Care, Guest Editor (2016)
Journal of Human Resources, Associate Editor (2011-13)
Forum for Health Economics & Policy, Editorial Board Member (2001-2012)
Economics Bulletin, Associate Editor (2004-2009)

SERVICE ON SCIENTIFIC REVIEW AND ADVISORY COMMITTEES (Selected)

- Standing member of the Health Services Organization and Delivery (HSOD) NIH review panel, 2012-2016
- NIH reviewer (various panels, too numerous to list) 2003-present
- NIH Review Panel Chair: 2018 (P01 review), 2020 (DP1 review).
- Invited Reviewer for the European Research Council, ERC Advanced Grant 2015 RFP
- NIH Stage 2 Challenge Grant Review Panel, July 2009
- Appointed a member of an Institute of Medicine (IOM) panel on the regulation of work hours by resident physicians, 2007-8.
- Standing member of the NIH Social Science and Population Studies Review Panel, Fall 2004-Fall 2008
- Invited Reviewer for National Academy of Sciences report on Food Insecurity and Hunger, November 2005.
- Invited Reviewer for the National Academy of Sciences report on the Nutrition Data Infrastructure, December 2004
- Invited Reviewer for the National Institute on Health (NIH) Health Services Organization and Delivery Review Panel, June 2004, Alexandria, VA.
- Invited Reviewer for the Food Assistance and Nutrition Research Program US Department of Agriculture Economic Research Service Research Proposal Review Panel, June 2004, Stanford, CA.
- Invited Reviewer for the National Institute on Health (NIH) Social Science and Population Studies Review Panel, February 2004, Alexandria, VA.
- Invited Reviewer for the National Institute on Health (NIH) Social Sciences and Population Studies Review Panel, November 2003, Bethesda, MD.
- Invited Reviewer for the National Institute on Health (NIH) Social Science, Nursing, Epidemiology, and Methods (3) Review Panel, June 2003, Bethesda, MD.
- Invited Reviewer for the Food Assistance and Nutrition Research Program US Department of Agriculture Economic Research Service Research Proposal Review Panel, August 2002.
- Research Advisory Panel on Canadian Disability Measurement, Canadian Human Resources Development Applied Research Branch, June 2001 in Ottowa, Canada.

- Invited Reviewer for the National Institute of Occupational Safety and Health R18 Demonstration Project Grants Review panel in July 2000, Washington D.C.
- Research Advisory Panel on Japanese Health Policy Research. May 1997 at the Center for Global Partnership, New York, NY.

TESTIMONY TO GOVERNMENTAL PANELS AND AGENCIES (9)

- US Senate Dec. 2020 hearing of the Subcommittee on Homeland Security and Governmental Affairs. Testimony provided on COVID-19 mortality risk, collateral harms from lockdown policies, and the incentives of private corporations and the government to invest in research on low-cost treatments for COVID-19 disease
- "Roundtable on Safe Reopening of Florida" led by Florida Gov. Ron DeSantis. September 2020.
- "Evaluation of the Safety and Efficacy of COVID-19 Vaccine Candidates" July 2020 hearing of the House Oversight Briefing to the Economic and Consumer Policy Subcommittee.
- US Senate May 2020 virtual roundtable. Safely Restarting Youth Baseball and Softball Leagues, invited testimony
- "Population Aging and Financing Long Term Care in Japan" March 2013 seminar at the Japanese Ministry of Health.
- "Implementing the ACA in California" March 2011 testimony to California Legislature Select Committee on Health Care Costs.
- "Designing an Optimal Data Infrastructure for Nutrition Research" June 2004 testimony to the National Academy of Sciences commission on "Enhancing the Data Infrastructure in Support of Food and Nutrition Programs, Research, and Decision Making," Washington D.C.
- "Measuring the Effect of Overtime Reform" October 1998 testimony to the California Assembly Select Committee on the Middle Class, Los Angeles, CA.
- "Switching to Weekly Overtime in California." April 1997 testimony to the California Industrial Welfare Commission, Los Angeles, CA.

REFEREE FOR RESEARCH JOURNALS

American Economic Review; American Journal of Health Promotion; American Journal of Managed Care; Education Next; Health Economics Letters; Health Services Research; Health Services and Outcomes Research Methodology; Industrial and Labor Relations Review; Journal of Agricultural Economics; Journal of the American Medical Association; Journal of Health Economics; Journal of Health Policy, Politics, and Law; Journal of Human Resources; Journal of Political Economy; Labour Economics; Medical Care; Medical Decision Making; Review of Economics and Statistics; Scandinavian Journal of Economics; Social Science and Medicine; Forum for Health Economics and Policy; Pediatrics; British Medical Journal

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Dissertation Committee Memberships

Ron Borzekowski	Ph.D. in Economics	Stanford University	2002
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Ed Johnson	Ph.D. in Economics	Stanford University	2003
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James Pearce	Ph.D. in Economics	Stanford University	2004
Mikko Packalen	Ph.D. in Economics	Stanford University	2005
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Andrew Jaciw	Ph.D. in Education	Stanford University	2010
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Michael Dworsky	Ph.D. in Economics	Stanford University	2013
Allison Holliday King	Masters in Liberal Arts Program	Stanford University	2013
Vilsa Curto	Ph.D. in Economics	Stanford University	2015
Rita Hamad	Ph.D. in Epidemiology	Stanford University	2016
Atul Gupta	Ph.D. in Economics	Stanford University	2017
Yiwei Chen	Ph.D. in Economics	Stanford University	2019
Yiqun Chen	Ph.D. in Health Policy	Stanford University	2020
Min Kim	Ph.D. in Economics	Iowa State Univ.	2021
Bryan Tysinger	Ph.D. in Public Policy	RAND Graduate School	2021

E. GRANTS AND PATENTS

PATENT (2)

1. "Environmental Biomarkers for the Diagnosis and Prognosis for Type 2 Diabetes Mellitus" with Atul Butte and Chirag Patel (2011), US Patent (pending).
2. "Health Cost and Flexible Spending Account Calculator" with Schoenbaum M, Spranca M, and Sood N (2008), U.S. Patent No. 7,426,474.

GRANTS AND SUBCONTRACTS (42)

CURRENT (6)

2019-2020 Funder: Acumen, LLC.
Title: Quality Reporting Program Support for the Long-Term Care Hospital, Inpatient Rehabilitation Facility, Skilled Nursing Facility QRPs and Nursing Home Compare
Role: PI

2018-2020 Funder: Acumen, LLC.
Title: Surveillance Activities of Biologics

Role: PI

2018-2020 Funder: France-Stanford Center for Interdisciplinary Studies
Title: A Nutritional Account of Global Trade: Determinants and Health Implications
Role: PI

2017-2023 Funder: National Institutes of Health
Title: The Epidemiology and Economics of Chronic Back Pain
Role: Investigator (PI: Sun)

2017-2021 Funder: National Institutes of Health
Title: Big Data Analysis of HIV Risk and Epidemiology in Sub-Saharan Africa
Role: Investigator (PI: Bendavid)

2016-2020 Funder: Acumen, LLC.
Title: MACRA Episode Groups and Resource Use Measures II
Role: PI

PREVIOUS (36)

2016-2018 Funder: University of Kentucky
Title: Food acquisition and health outcomes among new SNAP recipients since the Great Recession
Role: PI

2015-2019 Funder: Alfred P. Sloan Foundation
Title: Public versus Private Provision of Health Insurance
Role: PI

2015-2019 Funder: Natural Science Foundation
Title: Health Insurance Competition and Healthcare Costs
Role: Investigator (PI: Levin)

2014-2015 Funder: The Centers for Medicare and Medicaid Services
Title: Effect of Social Isolation and Loneliness on Healthcare Utilization
Role: PI

2014-2015 Funder: AARP
Title: The Effect of Social Isolation and Loneliness on Healthcare Utilization and Spending among Medicare Beneficiaries
Role: PI

2013-2019 Funder: National Bureau of Economic Research
Title: Innovations in an Aging Society
Role: PI

2013-2014 Funder: Robert Wood Johnson Foundation
Title: Improving Health eating among Children through Changes in Supplemental Nutrition Assistance Program (SNAP)
Role: Investigator (PI: Basu)

2011-2016 Funder: National Institutes of Health (R37)
Title: Estimating the Potential Medicare Savings from Comparative Effectiveness Research

Role: PI Subaward (PI: Garber)

2011-2016 Funder: National Institute of Aging (P01)
Title: Improving Health and Health Care for Minority and Aging Populations
Role: PI Subcontract (PI: Wise)

2010-2018 Funder: National Institutes of Health
Title: Clinic, Family & Community Collaboration to Treat Overweight and Obese Children
Role: Investigator (PI: Robinson)

2010-2014 Funder: Agency for Health, Research and Quality (R01)
Title: The Effects of Private Health Insurance in Publicly Funded Programs
Role: Investigator (PI: Bundorf)

2010-2013 Funder: Agency for Healthcare Research and Quality
Title: G-code" Reimbursement and Outcomes in Hemodialysis
Role: Investigator (PI: Erickson)

2010-2013 Funder: University of Southern California
Title: The California Medicare Research and Policy Center
Role: PI

2010-2012 Funder: University of Georgia
Title: Natural Experiments and RCT Generalizability: The Woman's Health Initiative
Role: PI

2010-2011 Funder: National Bureau of Economic Research
Title: Racial Disparities in Health Care and Health Among the Elderly
Role: PI

2009-2020 Funder: National Institute of Aging (P30)
Title: Center on the Demography and Economics of Health and Aging
Role: PI (2011-2020)

2009-2011 Funder: Rand Corporation
Title: Natural Experiments and RCT Generalizability: The Woman's Health Initiative
Role: PI

2008-2013 Funder: American Heart Association
Title: AHA-PRT Outcomes Research Center
Role: Investigator (PI: Hlatky)

2007-2009 Funder: National Institute of Aging (R01)
Title: The Economics of Obesity
Role: PI

2007-2009 Funder: Veterans Administration, Health Services Research and Development Service
Title: Quality of Practices for Lung Cancer Diagnosis and Staging
Role: Investigator

2007-2008 Funder: Stanford Center for Demography and Economics of Health and Aging
Title: The HIV Epidemic in Africa and the Orphaned Elderly

Role: PI

2007 Funder: University of Southern California
Title: The Changes in Health Care Financing and Organization Initiative
Role: PI

2006-2010 Funder: National Institute of Aging (K02)
Title: Health Insurance Provision for Vulnerable Populations
Role: PI

2006-2010 Funder: Columbia University/Yale University
Title: Dummy Endogenous Variables in Threshold Crossing Models, with Applications to Health Economics
Role: PI

2006-2007 Funder: Stanford Center for Demography and Economics of Health and Aging
Title: Obesity, Wages, and Health Insurance
Role: PI

2005-2009 Funder: National Institute of Aging (P01 Subproject)
Title: Medical Care for the Disabled Elderly
Role: Investigator (PI: Garber)

2005-2008 Funder: National Institute of Aging (R01)
Title: Whom Does Medicare Benefit?
Role: PI Subcontract (PI: Lakdawalla)

2002 Funder: Stanford Center for Demography and Economics of Health and Aging
Title: Explaining Changes in Disability Prevalence Among Younger and Older American Populations
Role: PI

2001-2003 Funder: Agency for Healthcare Research and Quality (R01)
Title: State and Federal Policy and Outcomes for HIV+ Adults
Role: PI Subcontract (PI: Goldman)

2001-2002 Funder: National Institute of Aging (R03)
Title: The Economics of Viatical Settlements
Role: PI

2001-2002 Funder: Robert Woods Johnson Foundation
Title: The Effects of Medicare Eligibility on Participation in Social Security Disability Insurance
Role: PI Subcontract (PI: Schoenbaum)

2001-2002 Funder: USDA
Title: Evaluating the Impact of School Breakfast and Lunch
Role: Investigator

2001-2002 Funder: Northwestern/Univ. of Chicago Joint Center on Poverty
Title: The Allocation of Nutrition with Poor American Families
Role: PI Subcontract (PI: Haider)

2000-2002 Funder: National Institute on Alcohol Abuse & Alcoholism (R03)
Title: The Demand for Alcohol Treatment Services
Role: PI

2000-2001 Funder: USDA
Title: How Should We Measure Hunger?

Role: PI Subcontract (PI: Haider)

F. SCHOLARSHIPS AND HONORS

- Phi Beta Kappa Honor Society, 1988
- Distinction and Departmental Honors in Economics, Stanford University, 1990
- Michael Forman Fellowship in Economics, Stanford University, 1991-1992
- Agency for Health Care Policy and Research Fellowship 1993-1995
- Outstanding Teaching Assistant Award, Stanford University, Economics, 1994
- Center for Economic Policy Research, Olin Dissertation Fellowship, 1997-1998
- Distinguished Award for Exceptional Contributions to Education in Medicine, Stanford University, 2005, 2007, and 2013.
- Dennis Aigner Award for the best applied paper published in the *Journal of Econometrics*, 2013

G. LIST OF CASES IN WHICH I PREVIOUSLY OFFERED EXPERT WITNESS TESTIMONY

- *R.K., et al. v. Lee*, No. 3:21-cv-00725 (M.D. Tenn. 2021)
- *SID BOYS CORP. d/b/a Kellogg's Diner, and 143 Cafe Inc. d/b/a Toscana v. Cuomo, et al.*, No. 1:20-cv-6249 (E.D.N.Y. 2020)
- *Tandon v. Newsom*, No. 5:20-cv-07108-LHK (N.D.Cal. 2020)
- *Kane v. De Blasio,* No. 21-CV-7863 (VEC), 2021 U.S. Dist. LEXIS 239124 (S.D.N.Y. Dec. 2021)
- *Netzer Law Office, P.C. and Donald L. Netzer v. Montana*, DV-2021-089 (Mont. Seventh Jud. Dist. 2021).
- *UnifySCC v. Cody*, No. 22-cv-01019-BLF, 2022 U.S. Dist. LEXIS 116386 (N.D. Cal. June 30, 2022)
- *Calvary Chapel of Ukiah v. Newsom*, 524 F. Supp. 3d 986, 1000 (E.D. Cal. 2021)
- *Gateway City Church v. Newsom*, 516 F. Supp. 3d 1004, 1020 (N.D. Cal. 2021)
- *Brach v. Newsom*, No. 2:20-cv-06472-SVW-AFM, 2020 U.S. Dist. LEXIS 232008 (C.D. Cal. 2020)
- *S. Bay United Pentecostal Church v. Newsom*, 494 F. Supp. 3d 785 (S.D. Cal. 2020)
- *Hernandez v. Grisham*, 494 F. Supp. 3d 1044 (D.N.M. 2020)
- *DeSantis v. Fla. Educ. Ass'n,* 306 So. 3d 1202 (Fla. Dist. Ct. App. 2020)
- *Cty. of L.A. Dep't of Pub. Health v. Superior Court,* 61 Cal. App. 5th 478, 275 Cal. Rptr. 3d 752 (2021) and *California Restaurant Association, Inc. v. County of Los Angeles Department of Public Health*, No. 20STCP03881 (Cal.Super. 2020)
- *Cross Culture Christian Ctr. v. Newsom*, 445 F. Supp. 3d 758, 763 (E.D. Cal. 2020)