

Communication from Public

Name: Lina Bedolla

Date Submitted: 09/28/2021 07:08 PM

Council File No: 21-0878

Comments for Public Posting: As a Los Angeles county resident, I urge you to VOTE NO and to VOTE AGAINST a vaccine mandate to enter public spaces. This is segregating public spaces and discriminating based off personal medical decisions. This will harm minority communities who have lower vaccination numbers. This will harm businesses and cause more civil unrest as people are discriminated and segregated. Please respect citizens to make their own medical choices, respect businesses to make their own business decisions, and respect the freedom to choose for everyone in this county and in this country. Thank you.

Communication from Public

Name: Sadie Mestman

Date Submitted: 09/28/2021 06:02 PM

Council File No: 21-0878

Comments for Public Posting: I am requesting that vaccination-proof is required entering any indoor event. An example would be a restaurant, gym, stores, medical offices.

Communication from Public

Name: AMP

Date Submitted: 09/28/2021 10:11 PM

Council File No: 21-0878

Comments for Public Posting: Please VOTE NO on the COVID-19 Vaccine Ordinance. This is DISCRIMINATION and is not right. Even Johnson & Johnson Scientists are saying #1 don't get the J&J shot, and #2, Kids don't need it. This is new news that was released just yesterday, and MORE information is coming out about these pharmaceutical companies trying to take dominion over our bodies: Please review this and watch the video:
<https://www.projectveritas.com/news/johnson-and-johnson-children-dont-need-the-f-cking-covid-vaccine-because/> As we come to deal with the after effects of lockdown, we are finding that the impact on our students has been monumental. They have overcome immense pain and tolerance to the everyday actions around us as we learn to navigate COVID-19 and look forward to the future. There is much talk about Americans jumping through additional hoops in order to return to a "Normal" life, every single person should have the ability to choose the best route of care for themselves and their families. Civil Rights and Liberties are proclaimed in the Declaration of Independence, the Nuremberg Code (Informed Consent) and protected in the Constitution, should ensure our unalienable rights to bodily autonomy. Medical ethicists have long maintained that a patient who has been coerced to consent to injection of biotechnology or a medical procedure, due to fear of losing access to basic necessities (i.e. food, medical care, education, employment, travel, freedom) should not be presumed to have provided lawful informed consent to the injection or medical procedure. Medical mandates and coercion violate the Nuremberg code and our unalienable rights to bodily autonomy. The American people must retain their ability to decline, refuse, and opt out of any and all medical procedures. Legislation and policies should empower and support an individual making their own medical decisions through education, informed consent, with equitable alternatives. Liability free products must be offered without mandates, coercion and restrictions of freedom placed upon the U.S. citizens. We must learn from our history or be doomed to repeat the great injustices of our past. Please protect the American people from another potential great civil and human rights travesty. I am primarily concerned for our health data privacy, being denied services, and having to compromise after everything that has been overcome in the last year. The route to return to normal should lie in the hands of the people, and done without additional barriers and inequities that we have fought so hard to diminish in this lifetime. We are at a crossroads and really need your support to protect the rights of every citizen of this nation. Thank you for your consideration of my viewpoint on this matter, I believe it is an important issue that needs strong legislation to prohibit ill use of these guidelines. I look forward to ensuring our health rights are protected, as we are AMERICAN. America is about FREEDOM. Do not ruin this! Stand for freedom.

Communication from Public

Name: Marc Gans

Date Submitted: 09/28/2021 08:34 PM

Council File No: 21-0878

Comments for Public Posting: I am writing to vehemently oppose the City Council's nonsensical and unscientific proposed vaccine passport regime. I'm sure this will fall on deaf ears and you will be swept up in the current mass hysteria, but know that I – a lifelong liberal resident of Los Angeles – will be moving away from here very shortly because of your (and the County Supervisors' analogous) myopic decision. I refuse to live in a dystopic, medical apartheid society where I have to "show my papers" to participate in normal day-to-day life. And do not pejoratively brand me with the strawman label "anti-vax" – I'm anti-passport and anti-mandate. From Dr. Marty Makary (Professor at the Johns Hopkins School of Medicine, Bloomberg School of Public Health and Carey School of Business) (<https://www.usnews.com/news/national-news/why-covid-19-vaccines-should-not-be-required-for-all-americans>): Those who choose not to get vaccinated are making a poor health decision at their own individual risk. They pose no public health threat to those already immune. Would we be so stern toward people making similar or worse health choices to smoke, drink alcohol or not wear a helmet when riding a bike? Over 85,000 Americans die annually from alcohol, yet we don't have the same public health fervor or requirements to save those lives. Let's encourage vaccination rather than activate the personal liberty culture wars that result in people becoming more entrenched in their opposition. The notion that we have to vaccinate every living, walking American – and eventually every newborn – in order to control the pandemic is based on the false assumption that the risk of dying from COVID-19 is equally distributed in the population. It's not. We have always known that it's very hard for the virus to hurt someone who is young and healthy. And that's still the case. Also: Some people already have 'natural immunity' – that is, immunity from prior COVID infection. During every month of this pandemic, I've had debates with other public researchers about the effectiveness and durability of natural immunity. I've been told that natural immunity could fall off a cliff, rendering people susceptible to infection. But here we are now, over a year and a half into the clinical experience of observing patients who were infected, and natural immunity is effective and going strong. And that's because with natural immunity, the body develops antibodies to the entire surface of the virus, not just a spike protein constructed from a vaccine. The power of natural immunity was recently affirmed in an Israeli study, which found a 6.7 times greater level of protection among those with natural immunity vs. those with vaccinated immunity. Requiring the vaccine in people who are already immune with natural immunity has no scientific support. While vaccinating those people may be beneficial – and it's a reasonable hypothesis that vaccination may bolster the longevity of their immunity – to argue dogmatically that they must get vaccinated has zero clinical outcome data to back it. As a matter of fact, we have data to the contrary: A Cleveland Clinic study found that vaccinating people with natural immunity did not add to their level of protection. From Martin Kulldorff (Professor at Harvard Medical School) and Dr. Jay Bhattacharya Professor at Stanford Medical School) (<https://www.wsj.com/amp/articles/vaccine-passports-prolong-lockdowns-11617726629> - Archive link: <https://archive.is/KOQqD>): Covid vaccine passports would harm, not benefit, public health. The idea that everybody needs to be vaccinated is as scientifically baseless as the idea that nobody does. Covid vaccines are essential for older, high-risk people and their caretakers and advisable for many others. But those who've been infected are already immune. The young are at low risk, and children—for whom no vaccine has been approved anyway—are at far less risk of death than from the flu. If authorities mandate vaccination of those who don't need it, the public will start questioning vaccines in general. Effective public health relies on trust. The public has lost trust in officials in part because they've performed poorly—relying on lockdowns to disastrous effect—and in part because they've made clear their distrust of the public. Trust, after all, is a two-way street. Coercive vaccination policies would erode trust even further. Even well-informed people may legitimately wonder: Why are they forcing me to take this shot if it's so good for me? Vaccine passports are unjust and discriminatory. Most of those endorsing the idea belong to the laptop class—privileged professionals who worked safely and comfortably at home during the epidemic. Millions of Americans did essential jobs at their usual workplaces and became immune the hard way. Now they would be forced to risk adverse reactions from a vaccine they don't need.

Communication from Public

Name: \$25 FILING FEE TO APPEAL COVID-19 ADMINISTRATIVE FINE LOS ANGELES SUPERIOR COURT

Date Submitted: 09/28/2021 09:33 PM

Council File No: 21-0878

Comments for Public Posting: From a snitch: FOR A MERE \$25 FILING FEE OR A FEE WAIVER: If the City uses an Administrative Fine mechanism, here are the two forms HEREBY ATTACHED BELOW IN PDF, you might look at, and third party intervenors, and amicus curiae briefs may be permitted. Discovery is a matter of right, not an option. Please note, this is not intended to offer or solicit legal advice or services, and is not offering legal advice. For more information, a possible avenue of FREE consultation contact: L.A. Law Library 213 785-2529, or your local Bar Association, or LACOURTS.org.

NAME, ADDRESS, AND TELEPHONE NUMBER OF ATTORNEY OR PARTY WITHOUT ATTORNEY:	STATE BAR NUMBER	Reserved for Clerk's File Stamp
ATTORNEY FOR (Name): SUPERIOR COURT OF CALIFORNIA, COUNTY OF LOS ANGELES		
COURTHOUSE ADDRESS:		
CONTESTANT: ADDRESS: TELEPHONE NUMBER: PROCESSING AGENCY: ADDRESS: TELEPHONE NUMBER:		
NOTICE OF APPEAL - ADMINISTRATIVE HEARING		CASE NUMBER:

NOTICE TO CONTESTANT

The contestant is responsible for the timely filing of the Notice of Appeal. **A separate Notice of Appeal - Administrative Hearing is required for each citation.** When the Court returns a copy of this notice to you with the date, place and time of the hearing filled in, you must serve a copy of this notice upon the processing agency and file a copy of the original Proof of Service of this notice with the Court at least 10 days prior to the hearing date. The Court may not proceed on your appeal if proof of service has not been filed.

The Contestant in the above-titled action hereby appeals to the Superior Court of California, County of Los Angeles, from the final administrative decision on citation number: _____, which was issued on _____ (DATE).

- The hearing was ☐ by personal conference.
☐ by mailed declaration.

- The date of the final administrative decision was _____. (a copy of the final decision must be attached)
- The final administrative decision was ☐ personally delivered on _____ (DATE).
☐ mailed on _____ (DATE).

Dated: _____ Signature of Contestant

NOTICE OF HEARING

For Court Use Only:

A hearing will be held in the Superior Court of California, County of Los Angeles, on the date and time shown below.

Date	Time	Dept.	Court Location

SHERRI R. CARTER, Executive Officer/Clerk

Dated: _____ By: _____ Deputy Clerk

Communication from Public

Name: Brian F Carmody

Date Submitted: 09/28/2021 11:20 AM

Council File No: 21-0878

Comments for Public Posting: PLEASE consider the practical implementation of this policy. I watched the meeting a month ago and was appalled that not one of the council members seemed to consider this point, that while you all may feel very self-satisfied about patting yourselves on the back for "doing something", it should blatantly obvious to those not deliberately ignorant, that it will not be any member of the City Council actually enforcing these draconian measures. Rather, the ones you will be demanding stand in front of stores asking private citizens for their medical records and refusing them service otherwise will be day to day workers, many of them minimum wage. The teenager at McDonalds or the movie theater will be placed in a very uncomfortable position, almost certainly hostile and, as long as we're living in the real world here, possibly violent, or did that not cross your mind at all? Imagine shouting matches and shovelfests thousands of times each day across the city. Will every bartender and barista even bother to enforce this? Will we need the police called out each time? Did you people stop to think that actions have consequences? Am I exaggerating? Look at what has already happened in New York: <https://www.nytimes.com/2021/09/18/nyregion/carmines-vaccination-fight.html>, <https://www.newsweek.com/unvaccinated-man-refuses-leave-pizza-restaurant-viral-video-1629377> Are you really so naive to believe this won't happen here? Do you think this will make Los Angeles a more peaceful, pleasant place to live? Will it even be effective? Think about it?

Communication from Public

Name: Daniel Kegel

Date Submitted: 09/28/2021 04:18 PM

Council File No: 21-0878

Comments for Public Posting: I write in SUPPORT of council file 21-0878's proposed ordinance requiring vaccination to enter indoor entertainment facilities, city facilities, or large outdoor events. While cases are falling, they are a long way from low; daily infections are still much higher than they were back in June. 26,000 people have already died from coronavirus in LA County, 186 last week alone, and this ordinance is a thoughtful way to help put a stop to the deaths and hospitalizations. Its provisions are lenient, and do not force anyone to be vaccinated, yet they send a clear message that vaccination is needed to address the current public health crisis, and prevent worse waves in the future. Please pass it so we can start getting back to normal! Thank you, Dan Kegel Resident, CD10

Communication from Public

Name: Professor Jeffrey D. Klausner MD MPH

Date Submitted: 09/28/2021 05:15 PM

Council File No: 21-0878

Comments for Public Posting: Dear Council Members, As a former public health official with the Centers for Disease Prevention and Control and local county deputy health officer as well as current Professor of Medicine, Population and Public Health Sciences at the Keck School of Medicine of the University of Southern California (for identification purposes only; any opinions or statements are my own and do not represent those of the University), I strongly urge several modifications be considered in this ordinance to require proof of full vaccination to enter certain indoor locations. 1) There should be a clear allowable exemption for those with documented prior SARS-CoV-2 infection that may be verified by a physician through microbiological evidence (polymerase chain reaction+, antigen+ or serum antibody+). There is ample and growing published evidence that prior infection provides equal or better immunity to repeat infection. In a peer-reviewed and published systematic review, 10 studies from 6 different countries in over 9 million people found a protective effect of 90% of prior infection against repeat infection, similar or better than the current estimate of vaccine effectiveness. Those studies confirm multiple biological studies showing the durable presence of antibody and cellular immunity up to 10 months after infection. Similar to other viral infections, after recovery individuals have prolonged immunity against infection and transmission. In fact in a study of SARS-CoV-1 infected patients, now 17 years later, those studied have evidence of continued immunity. City policy should not discriminate against those with prior infection. Vaccination after infection is safe, however, some who have recovered from infection and are immune may prefer not to seek vaccination and should not be denied access to public property. Those with prior infection should be allowed the same rights as those vaccinated, not denied entry, not denied indoor accommodation and not required to provide evidence of absence of active infection with a negative recent test result for access. 2) The current language of the ordinance states that the requirements will sunset upon the Mayor's declaration that the public health emergency is over. There are no criteria for that ending of the declaration. The ordinance is a public health intervention and should end when the public health needs are no longer justified. That should be on the basis of a measurable indicators like adequate population

immunity or when the number of hospitalizations per 100,000 people reach a minimal level associated with a "flattened curve," and no risk for a deficiency in hospital services. In a City like Los Angeles with a population of 4 million, a reasonable metric is when the number of hospitalizations is less than 5 per 100,000 or specifically, less than 200 hospitalized individuals per the City population for a steady period of 14 days. Addressing point #1 will put LA City on par with Israel and the European Union that recognize the legitimacy and importance of immunity after prior infection. Their immunity passports allow for inclusion of prior infection, in addition to vaccination history or negative SARS-CoV-2 test in the past 72 hours. Thank you for your consideration. Sincerely, Jeffrey D. Klausner, MD, MPH
Professor of Medicine and Infectious Diseases Professor of Population and Public Health Sciences

A Systematic Review of the Protective Effect of Prior SARS-CoV-2 Infection on Repeat Infection

N. Kojima¹ , N. K. Shrestha², and J. D. Klausner³

Abstract

We systematically reviewed studies to estimate the risk of SARS-CoV-2 reinfection among those previously infected with SARS-CoV-2. For this systematic review, we searched scientific publications on PubMed and MedRxiv, a pre-print server, through August 18, 2021. Eligible studies were retrieved on August 18, 2021. The following search term was used on PubMed: (((“Cohort Studies”[Majr]) AND (“COVID-19”[Mesh] OR “SARS-CoV-2”[Mesh])) OR “Reinfection”[Majr]) OR “Reinfection”[Mesh]. The following search term was used on MedRxiv: “Cohort Studies” AND “COVID-19” OR “SARS-CoV-2” AND “Reinfection”. The search terms were broad to encompass all applicable studies. There were no restrictions on the date of publication. Studies that did not describe cohorts with estimates of the risk of SARS-CoV-2 reinfection among those with previous infection were excluded. Studies that included vaccinated participants were either excluded or limited to sub-groups of non-vaccinated individuals. To identify relevant studies with appropriate control groups, we developed the following criteria for studies to be included in the systematic analysis: (1) baseline polymerase chain reaction (PCR) testing, (2) a uninfected comparison group, (3) longitudinal follow-up, (4) a cohort of human participants, i.e. not a case report or case series, and (5) outcome determined by PCR. The review was conducted following PRISMA guidelines. We assessed for selection, information, and analysis bias, per PRISMA guidelines. We identified 1,392 reports. Of those, 10 studies were eligible for our systematic review. The weighted average risk reduction against reinfection was 90.4% with a standard deviation of 7.7% (p -value: <0.01). Protection against SARS-CoV-2 reinfection was observed for up to 10 months. Studies had potential information, selection, and analysis biases. The protective effect of prior SARS-CoV-2 infection on re-infection is high and similar to the protective effect of vaccination. More research is needed to characterize the duration of protection and the impact of different SARS-CoV-2 variants.

Keywords

SARS-CoV-2, COVID, COVID-19, prior infection, reinfection, natural immunity, vaccination, vaccine, immunity

Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the causative agent of coronavirus disease 2019 (COVID-19), is highly infectious and continues to cause substantial morbidity and mortality (Dong et al., 2020; Jin et al., 2020). Prior to the development of highly safe and effective vaccines for SARS-CoV-2 infection, scientists reported that a history of COVID-19 was associated with reduced risk of SARS-CoV-2 reinfection (Addetia et al., 2020). Virus-induced immunity has been described in many infections and is responsible for the decline of epidemic spread associated with exhaustion of the susceptible population (Rouse & Sehrawat, 2010). However, the duration and degree of the protective effect of SARS-CoV-2s-induced immunity is poorly studied.

Prior epidemiologic studies have found that individuals who are SARS-CoV-2 antibody-positive are protected against reinfection (Abu-Raddad et al., 2021; Harvey et al., 2021; Jeffery-Smith et al., 2021). Furthermore, investigators have reported that even those with prior SARS-CoV-2 infection *who*

lacked detectable antibodies were at 80% lower risk of reinfection than people who were SARS-CoV-2 naïve (Breathnach et al., 2021). One retrospective study that analyzed test results among nearly 10,000 individuals with prior SARS-CoV-2 infection found that only 0.7% became reinfected with SARS-CoV-2 (Qureshi et al., 2021).

Other studies have also described reduced risk of infection, morbidity, and mortality among those with prior COVID-19. A study conducted in Austria found that the frequency of

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Table 1. Studies Through August 8, 2021, That Show Prior COVID-19 Infection Reduces Risk for Reinfection.

Setting	Percent Reduction in Reinfection	Sample Size	Follow-Up	Reference	
Israel	94.8%	238,702	9.92 million person-months	Goldberg et al., April 20, 2021	(Goldberg et al., 2021)
England	84.0%	25,661	Median 9.2 months (IQR: 7.3-9.7)	Hall et al., April 9, 2021	(Hall et al., 2021)
Denmark	80.5%	525,339	Up to 10.3 months	Hansen et al., March 27, 2021	(Hansen et al., 2021)
USA	100.0%	5,052	12625.2 person-months	Kojima et al., July 8, 2021	(Kojima et al., 2021)
US Marines	82.0%	3,076	1.9 months	Letizia et al., April 15, 2021	(Letizia et al., 2021)
Austria	91.0%	8,900,480	Up to 9.4 months	Pilz et al., February 13, 2021	(Pilz et al., 2021)
USA	84.0%	16,101	8.4 months	Rennert et al., May 16, 2021	(Rennert & McMahan, 2021)
USA	81.8%	150,325	Up to 9.8 months	Sheehan et al., March 15, 2021	(Sheehan et al., 2021)
USA	100.0%	52,238	Median 5.1 months (IQR: 2.7-6.4)	Shrestha et al., June 1, 2021	(Shrestha et al., 2021)
Italy	94.0%	13,496	Mean 9.3 months (SD 1.4)	Vitale et al., May 28, 2021	(Vitale et al., 2021)
Weighted average	90.4%	9,930,470			

hospitalization and death due to a SARS-CoV-2 reinfection was 5 out of 14,840 (0.03%) and 1 out of 14,840 (0.01%), respectively (Pilz et al., 2021).

A history of COVID-19 may be as protective against reinfection as vaccination for SARS-CoV-2. A study investigating the frequency of repeat infection among laboratory personnel undergoing daily testing found no difference in SARS-CoV-2 infection rates between those with prior COVID-19 versus those vaccinated for SARS-CoV-2 infection (Kojima et al., 2021). Thompson et al. also reported that the decrease in risk of SARS-CoV-2 reinfection among those with prior infection was similar in magnitude to the relative risk reduction against SARS-CoV-2 infection among those who were vaccinated (Thompson et al., 2021). In a longitudinal study conducted among employees at the Cleveland Clinic, vaccination was not found to be associated with a lower risk of SARS-CoV-2 infection among people with prior COVID-19 (Shrestha et al., 2021).

Despite the availability of safe and effective vaccines, rates of SARS-CoV-2 infection are again increasing, especially among those without immunity (Christie et al., 2021). We aimed to determine the protective effect of previous infection among those who have not been also vaccinated against SARS-CoV-2. We systematically reviewed published longitudinal studies to estimate the risk of SARS-CoV-2 reinfection among those previously infected with SARS-CoV-2.

Method

For this systematic review, we searched scientific publications on PubMed and the pre-print server, MedRxiv, through August 18, 2021. Eligible studies were retrieved on August 18, 2021. The following search term was used on PubMed: (((“Cohort Studies”[Major]) AND (“COVID-19”[Mesh] OR “SARS-CoV-2”[Mesh])) OR “Reinfection”[Major]) OR “Reinfection”[Mesh].

The following search term was used on MedRxiv: “Cohort Studies” AND “COVID-19” OR “SARS-CoV-2” AND “Reinfection”. The search terms were broad to encompass all applicable studies. There were no restrictions on the date of publication. Studies that did not describe cohorts with estimates of the risk of SARS-CoV-2 reinfection among those with previous infection were excluded. Studies that included vaccinated participants were either excluded or limited to sub-groups of non-vaccinated individuals.

To identify relevant studies with appropriate control groups, we developed the following criteria for studies to be included in the systematic analysis: (1) baseline polymerase chain reaction (PCR) testing, (2) a uninfected comparison group, (3) longitudinal follow-up, (4) a cohort of human participants, i.e. not a case report or case series, and (5) outcome determined by PCR.

The review was conducted following PRISMA guidelines (Page et al., 2021). Abstracts were reviewed and ineligible studies were not included. Two reviewers identified studies for the systematic review. One reviewer collected data from each report and the other reviewer independently checked the work. If there was an inconsistency, reviewer one and reviewer two would discuss the study and come to a consensus.

Synthesis Methods

Articles that met criteria for the systematic review are shown in Table 1. We reviewed selected reports to extract the following information: Author, year of publication, study cohort, reinfection risk, and follow-up time in person-months when available. We assessed for selection, information, and analysis bias, per PRISMA guidelines. Due to the heterogeneity of the studies reviewed, sensitivity analyses and a meta-analysis was not attempted.

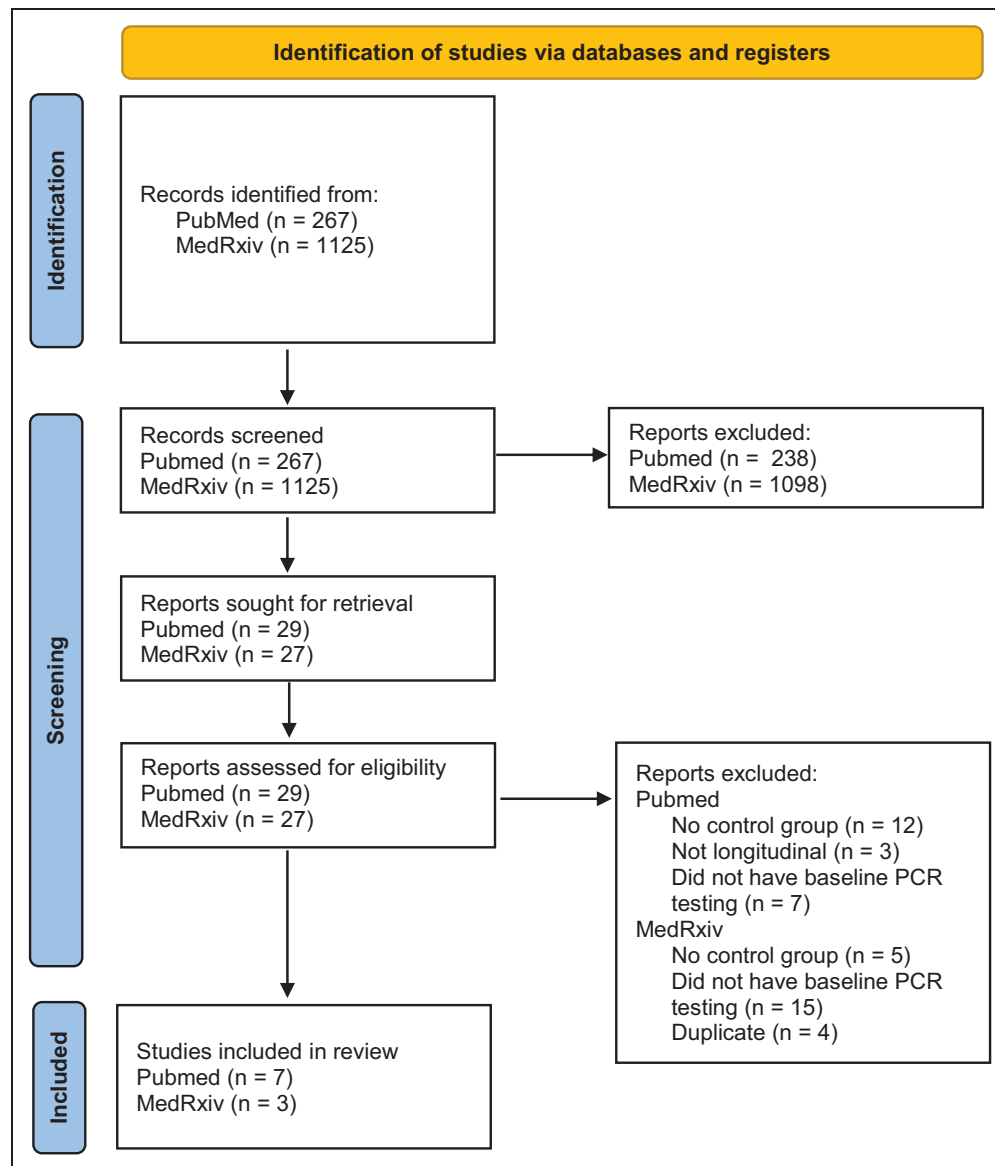


Figure 1. PRISMA flow diagram for systematic reviews.

Statistics

A *p*-value for percent reduction was calculated on StataSE (StataCorp, College Station, TX).

Registration

This systematic review was not registered.

Results

We identified 1,392 reports (Figure 1). Of those reports, 10 studies met the study inclusion criteria from 6 different countries. The total population in the 10 studies included 9,930,470 individuals with a median observation period that ranged from one to 10.3 months.

We found that the relative decreased risk of SARS-CoV-2 reinfection ranged between 80.5 to 100% compared to those without prior infection (Table 1). The weighted average risk reduction against reinfection was 90.4%, with a standard deviation of 7.7%. The *p*-value for percentage reduction was less than 0.01.

The studies conducted by Goldberg et al., Hansen et al., Pilz et al., and Vitale et al., had cohorts compiled from national databases, which may have generated a selection bias towards people who had access to SARS-CoV-2 testing and were registered (Goldberg et al., 2021; Hansen et al., 2021; Pilz et al., 2021; Vitale et al., 2021). The study conducted by Hall et al. followed a cohort of 30,625 participants (Hall et al., 2021). In their study 51 participants withdrew and 4,913 participants were excluded because they did not have linked data for SARS-CoV-2 testing. That may have biased their study against people who did not have follow up testing, i.e. information and

analysis bias. The study conducted by Letizia et al. studied young and healthy adults in the United States Marines who were undergoing basic training, and the housing conditions and interactions of individuals in that setting would not be readily extrapolated to the average population (Letizia et al., 2021). The study conducted by Rennert et al. studied university students that are younger and healthier than the average population (Rennert & McMahan, 2021). The study conducted by Shrestha et al. included younger and relatively healthier people, and since the study was done entirely after vaccines became available, there was also likely selection bias due to differential participation among those who decided not to get vaccinated (Shrestha et al., 2021).

The studies conducted by Hall et al., Rennert et al., and Sheehan et al., included follow-up that extended into the period when vaccines became available, and since vaccination was not controlled for, it is likely that vaccination among some subjects in the previously uninfected groups would have resulted in information bias resulting in an underestimation or overestimation of the effect size (Hall et al., 2021; Rennert & McMahan, 2021; Sheehan et al., 2021).

Discussion

We systematically reviewed published longitudinal studies of SARS-CoV-2 reinfection with PCR confirmed initial and repeat infections. We found that the weighted average risk reduction against reinfection was 90.4% and was statistically significant. Protection was observed up to 10 months. People with prior COVID-19 had a similar and durable level of protection when compared to those vaccinated against SARS-CoV-2 (Kojima et al., 2021; Stephens & McElrath, 2020).

In our systematic review, protection against SARS-CoV-2 reinfection was observed in up to 10 months following initial infection. It is not clear how long natural protection after infection will last. Biological studies have found persistent reservoirs of immunological active and antibody producing cells for up to 10 months or longer (Cohen et al., 2021).

The studies were conducted in 6 different countries. The studies ranged from participants that were younger than the national average (Letizia et al., 2021; Rennert & McMahan, 2021), as well as populations that were older than the national average (Vitale et al., 2021). Some studies followed participants at a national level (Goldberg et al., 2021; Hansen et al., 2021; Pilz et al., 2021), whereas other studies more closely followed cohorts (Letizia et al., 2021; Rennert & McMahan, 2021). While methodologies of studies differed, all reviewed studies consistently found decreased risk of reinfection among people with prior SARS-CoV-2 infection.

A recent United States Centers of Disease Control and Prevention (CDC) investigation conducted in Kentucky among persons with prior COVID-19 found that vaccination was associated with enhanced protection of those with prior infection (Cavanaugh et al., 2021). In the CDC study, lack of vaccination after infection was associated with an increased odds of repeat

SARS-CoV-2 infection, although the absolute increased risk of re-infection was very low. The study may have been biased due to different risk behaviors of the cases and controls. The study did not account for adherence with pandemic precautions (masking and social distancing), which would have been expected to have been different in the cases and controls.

Our study had several limitations. Our review was limited to studies with PCR confirmation of infection and re-infection. Multiple other studies, however, using SARS-CoV-2 antibody status as a measure of infection have similar results (Abu-Raddad et al., 2021; Harvey et al., 2021; Leidi, Berner, et al., 2021; Leidi, Koegler, et al., 2021). Our systematic review utilized some studies published on MedRxiv, a pre-print server. While MedRxiv has been helpful during the COVID-19 pandemic due to the rapid ability to disseminate information to colleagues, studies that were accessed on the site were not peer-reviewed. Furthermore, many of the studies cannot be replicated because they occurred in settings prior to the availability of vaccination against SARS-CoV-2 among people with history of infection.

Many of the studies including in our review followed people infected with SARS-CoV-2 earlier in the pandemic when infection was most likely with the original wildtype strain of SARS-CoV-2 before the development of variant strains. Therefore, our findings may differ in the current context of infections with exposure to variants that differ from the original infecting variant.

However a recent pre-print from a study conducted in the United Kingdom found among persons infected during a period of nearly exclusive Delta SARS-CoV-2 transmission, those fully vaccinated with BNT162b2 and ChAdOx1 (had similar levels of protection (82% and 67%, respectively) as those with previous infection (73%) (Pouwels et al., 2021). Additionally, in a recent retrospective cohort study that was conducted in Israel which compared rates of SARS-CoV-2 infection or reinfection with the Delta variant among SARS-CoV-2-naïve individuals who received the BNT162b2 vaccine to people who had recovered from COVID-19, found that vaccinated, but SARS-CoV-2-naïve people, had an *increased* risk of infection with the Delta variant when compared to people who had recovered from COVID-19 (Gazit et al., 2021). This association was statistically significant in two models that either matched to the time of the first event (13.1-fold increased risk) or did not match to time of first event (6.0-fold increased risk).

Implications

Our findings suggest that persons with prior COVID-19 are protected against SARS-CoV-2 reinfection. While protection has been observed in up to 10 months after initial infection, it is unclear how long the protection will last. Given the recency of new circulating variants like Delta, the protective effect of a previous infection with one variant and exposure to a different variant are uncertain. However, recent studies during the period of transmission of the Delta variant are promising.

Conclusions

There is consistent epidemiologic evidence that prior SARS-CoV-2 infection provides substantial immunity to repeat SARS-CoV-2 infection. Prior SARS-CoV-2 infections provide similar protection when compared to vaccination for SARS-CoV-2. Longer follow-up studies are needed to determine how long protection lasts for natural immunity, especially among higher risk groups such as those with chronic medical conditions and those that are immunocompromised. More research is needed to investigate whether initial disease severity changes the risk of repeat infection. Finally, more research is needed to determine how much protection persists against emerging variants, like the Delta variant of SARS-CoV-2.

Declaration of Conflicting Interests

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Communication from Public

Name: Shawn

Date Submitted: 09/28/2021 03:09 PM

Council File No: 21-0878

Comments for Public Posting: Vaccine passports are just another authoritarian policy to discriminate and segregate part of the population. It has not even been 50 years since Los Angeles stopped following the science with that eugenics project. The Libertarian party of Los Angeles is fighting back against this. Please join us! You do not have to be a libertarian, if you hate discrimination and authoritarian then please look us up

Communication from Public

Name: Kristen "Compean" Hauptli

Date Submitted: 09/28/2021 03:30 PM

Council File No: 21-0878

Comments for Public Posting: I want to begin by stating that I am a FEMALE MEXICAN, mother of 1 toddler aged-son who is expressing complete disdain for this proposed ordinance. There are a plethora of problems/issues that the City Council should be addressing, I don't have state the obvious, but have any you seen the number of homeless encampments? Closed businesses? Vacant/run-down properties? I can no longer stay silent when "elected" persons, WHO WORK FOR THE PEOPLE, manipulate their status and abilities and go on a power trip. You are completely overstepping your boundaries by shoving an ordinance that forces people to do the will of what an elected PERSON deems is right for them! I take issue with this since this decision is a PERSONAL CHOICE, since when did we begin mandating and REQUIRING flu vaccine shots? I still believe in personal freedoms and hope that our elected officials would do everything to protect these freedoms, but as I have seen in the last year--this is not the case. I respect people's personal choice to take the COVID vaccine or decline, because what makes America GREAT is the personal choices that we still have and our ability to think for ourselves! As these mandates and ordinances begin to take flight it greatly disheartens me that my son could very well be growing up in a nation where freedom no longer exists. So today, I submit this public comment on behalf of me, but more importantly for the future of my son. I hope that he has the privilege of choice and is not subjected to the demands or rules of the elected "elite". It has been 18 months, a vaccine exists, people who wish to take it can and those who wish to decline- should still have that choice. An ordinance of this magnitude will greatly defeat the progress we've made in country as this will reinstitute segregation practices and only further divide our community. I have heard accounts of the segregation that occurred towards my family members because of the color of their skin and this is another form, based on vaccine status. Let us not go backwards and repeat history, let us be better than the past and when we say "accept all" then show it.

Communication from Public

Name:

Date Submitted: 09/28/2021 03:31 PM

Council File No: 21-0878

Comments for Public Posting: Thank you for doing everything in your power to protect the public during this pandemic! We've had to use mandated vaccines in other disease outbreaks including the 1918 Spanish Influenza Pandemic, and it seems this is the best way to save the most lives and get this pandemic under control!