

Key words and SEO title: COVID-19 Vaccine Hesitancy

Title: Revisiting COVID-19 Shots- Was Caution Warranted?

Curious about whether Covid-19 vaccine hesitancy was borne out?

Researchers say, probably not, the shots are safe! In this review we walk you through the data so you can see for yourself...

How helpful were the COVID-19 vaccines?

The answer: very. Scientists have used data collected by public health bodies across the world to build mathematical models of how well the COVID-19 vaccines worked¹. Their models showed that vaccines likely prevented 14.4 million more COVID-19 deaths worldwide². The authors noted that this number could have been even higher but for two factors: inequitable vaccine access and vaccine hesitancy.

We need to address vaccine inequity

The World Health Organisation (WHO) has identified vaccine inequity as a major contributor to the COVID-19 pandemic spread and its resulting toll on lives and livelihoods. They identified that new technology needs to be developed to allow the rapid production and distribution of safe, effective vaccines before the new viruses can take hold and spread³.

What are the causes of vaccine hesitancy?

The reasons behind vaccine hesitancy in general are numerous and complex, and approaches to the COVID-19 vaccination programme were no different. During the COVID-19 pandemic, public health researchers spent time collecting data on what made people wary⁴. Their findings echo a report from Health Canada which identified 5 areas of concern that authorities need to address with respect to vaccine hesitancy. They are the 5 C's. Confidence, Complacency, Convenience, Calculation and Collective responsibility^{5,6}.

Confidence: A primary concern was lack of confidence in the effectiveness of vaccines in general and the safety of the newer technology mRNA COVID-19 vaccines in particular. Pregnant women, for example, may have been hesitant due to (now unfounded) fears that the vaccine might hurt their fetus in the early months of gestation. In 2020, some public health programmes had stressed that there was little data for SARS-CoV2 and pregnancy. Fortunately the American Association of Obstetricians and Gynecologists have now confirmed that COVID-19 illness poses no danger to the developing fetus⁷.

Other people felt that they did not have adequate information about the vaccine ingredients, worrying that they might contain substances forbidden under their religion⁸.

People in lower socioeconomic populations as well as from traditional cultures have a longstanding mistrust in general for medical interventions⁹. Historically they have been most likely to be abused by authorities including, but certainly not limited to, experiments such as the USPHS Untreated Syphilis Study at Tuskegee¹⁰.

There was a strong association between vaccine hesitancy and people with more conservative values too⁹. Factor in the motivations of public health messaging, and Big Pharma, resulted in a small but significant minority rejecting the vaccine altogether.

Some in the LGBTQ+ community had had unfortunate interactions with healthcare institutions in the past, making them unwilling to engage¹¹. Many people who admitted to being hesitant about taking up the COVID-19 vaccines said that past bad experiences of friends and family or inconsistent health messaging from public institutions (the CIA attempted to sabotage vaccination programmes in China, simultaneous degrading trust in the United States and other countries)^{4,11}.

Complacency: People who determine that the risk to themselves and their loved ones is low, and resolve to vaccinate at some point in the future at a convenient time⁶.

Convenience: Vaccines were initially available to only essential workers and the vulnerable. When sufficient supplies arrived, long queues and complex booking systems were haphazardly introduced^{5,6}. Many people put off the decision, sometimes indefinitely.

Calculation: COVID-19 was the first major pandemic to arrive in the modern digital age ie post social media. Never before, have so many had access to so much data, generated from unconfirmed sources. Many may have calculated their risk profiles from these sources⁵. To paraphrase the old saying - anxiety can travel half way around the world before science can put its shoes on.

Collective responsibility: Herd immunity has long been advanced as a goal in Public Health Programs. The idea is simple, if most of the kids in class are vaccinated, the few who aren't will be protected from the pathogens circulating at the time. SARS-CoV2 ruined that theory. The vaccines greatly reduced the severity of the illness but vaccinated people were still able to transmit the disease. A case in point Chinese researchers showed that vaccines against the SARS-CoV2 delta variant were 90% effective against virus spread, but the population immunity level would need to exceed 93% to protect the 7% who were unvaccinated¹². You cannot rely on Herd Immunity anymore.

What were the harms? Were these fears justified?

Was the hesitancy warranted? New report indicates, probably not. What's more for people who are hesitant right now, the contents might help to allay some of their fears...

In a step towards reassuring the public that the vaccines are being monitored and plenty of safety information is being gathered, the US government asked a committee of expert academic researchers to produce the National Academy of Sciences Vaccine

Safety Report⁹. The report gave a snap shot of safety of the 4 main COVID vaccines, by collecting data from all over the world about suspected vaccine injuries. Good news, they found that the vaccines had very few adverse events associated with them. The National Academy of Sciences report goes into much detail about the observed side effects and whether the virus was responsible for them or not.

Adverse vaccine events

Here, we will look at the risks of the more serious events and compare them directly to the risks imposed by the virus.

Myocarditis and **pericarditis**, or inflammation of the heart and surrounding tissue, have been associated with some COVID-19 mRNA vaccines¹³. While rare, it occurs in young males more than other groups, usually within seven days of receiving one of the mRNA-based vaccines. A massive study in India reported 1026 cases of myocarditis after vaccination with a COVID-19 vaccine¹⁴. This equated to 2 cases in every 10 million vaccinations.

Guillain-Barre Syndrome is a neurological condition that results in muscle weakness and possible temporary paralysis. It needs immediate medical attention. It is associated with several vaccines (non-mRNA varieties), and its incidence has been reported at 0.7 to 1.25 cases per million vaccine doses¹⁵. These were usually associated with the first dose and not subsequent shots.

Thrombosis, or blood clots, have also been recorded shortly after vaccination¹⁶. This is more likely to occur with non-mRNA vaccines but is still rare. Blood clots can obstruct blood supply to the heart and brain, causing heart attacks or stroke. The incidence varies widely by vaccine manufacturer, with the highest risk from the AstraZeneca vaccine having a 1 in 64000 to 1 in 125000 chance of experiencing a thrombosis¹⁷.

Anaphylaxis: Allergic reactions have been reported with some vaccines produced by traditional means¹⁸. The COVID-19 vaccine family was no different. Symptoms include hives, swelling, and shortness of breath, and they can be treated medically. The COVID-19 vaccines reported an incidence of 8.96 cases per million doses, with the more severe anaphylactic shock presenting at 1.46 cases per million doses¹⁸.

It is important to remember that most of these conditions are rare and are temporary if promptly treated. Nevertheless, if you experience any of the symptoms above, they should be treated immediately, regardless of your vaccine status.

How dangerous was the COVID-19 disease?

The impact of troublesome viruses can be assessed in two ways. Generally, they are ranked by their virulence (how many people they kill) and transmissibility (how quickly they spread).

Virulence: In 2020, the SARS-CoV-2 killed 1.7% of the people it infected¹. It was not particularly dangerous to the healthy but targeted older people and the

immunocompromised. This number dropped to below 0.3% by 2022 as the population adapted to the new variants, predominantly by vaccinating against the virus¹⁹. Without vaccines, the pandemic could have been much worse. Compare this to hemorrhagic fevers, such as Ebola, which kill 30-60% of their victims²⁰. The Olympic Champion of Pestilence is the rabies virus, which claims 100% of the unvaccinated²¹. Fortunately, all these lethal agents can be controlled with vaccines.

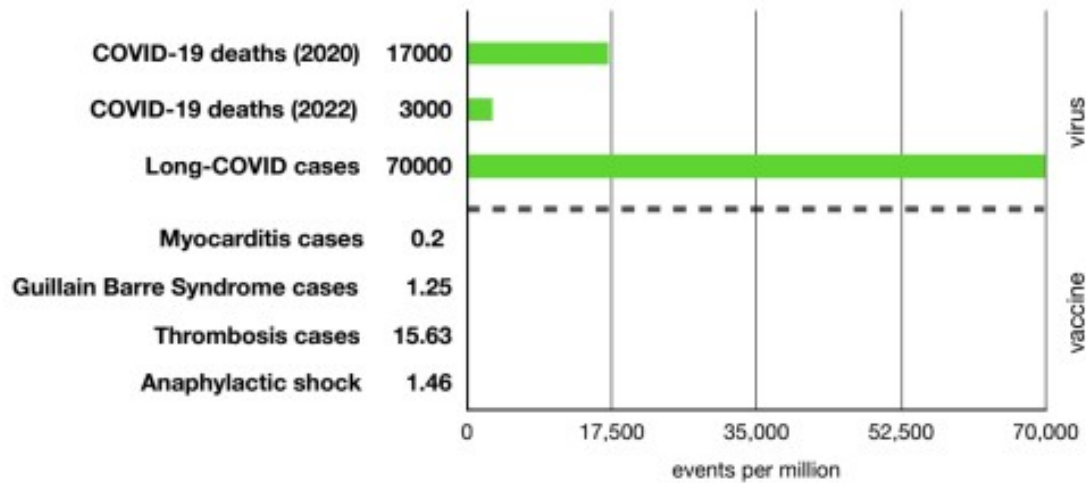
Transmissibility: This measures how contagious a virus is by calculating its attack rate, essentially how many new people a sick person can infect. The SARS-CoV-2 variants had an attack rate between 3.4 and 8.2²². This makes the SARS-CoV-2 Omicron variant, at 8.2, one of the most contagious viruses in history. It's in fourth place behind joint second-place holders polio and chicken pox at 11 and the gold medal winner, measles, at 15. Fortunately, science has developed sophisticated weapons against these four scourges. Vaccines. Respiratory viruses are at the top of the contagious disease list as they spread more easily and readily than viruses such as herpes and HIV (AIDS).

To vaccinate, or not to vaccinate? Lets compare the risks of both paths.

The risk of death in the general population has already been covered- 0.3-1.7% of total infections^{1,2,22}. However there is another side effect to consider – Long Covid. The more vaccinations you get, the less likely you will develop long COVID²³. This chronic condition is most often reported in people who have had severe COVID-19. It is defined as excessive fatigue, coughing, and brain fog lasting over three months from the initial COVID-19 infection. It may account for as much as 7% of Covid sufferers²⁴. You can read more about long COVID here.

It may help to compare all the statistics presented above in a figure. To do this, let's convert all the numbers from the risk of death from COVID-19 and stack them against the risk of experiencing one of the medical adverse events. Figure 1 displays events per million infections (virus risk) or per million vaccine doses (vaccine risk).

Figure 1: COVID-related risk vs vaccine-related risk



In conclusion, the National Academy of Sciences publication and other papers presented here represent the most up to date and comprehensive vaccine safety report available. The evidence is clear - COVID-19 vaccines are safe and effective for everybody⁹. Furthermore, booster doses are particularly helpful to older people and the vulnerable^{25,26}. Serious side effects are rare and far less common than those caused by the virus. Vaccines allow the healthy to function in society and keep hospitals open.

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