

Vaccination Myths Debunked by Dr Michelle Dickinson

In our target to reduce New Zealand's restrictions around the Covid-19 pandemic, anti-vax sentiment is a big problem on top of delays in the vaccine roll out; we are up against an alarming number of Kiwis who simply refuse to get vaccinated. Anyone who doubts the safety of the Pfizer vaccine is invited to read the below document debunking popular vaccine myths, provided by Dr Michelle Dickinson, MNZM, a respected scientist with a PhD in Biomedical and Materials Engineering.

Myth1: The vaccine is still in the trial phase & the vaccine is experimental

The Pfizer-BioNTech COVID-19 vaccine is no longer in trial status and completed its final Phase 3 clinical trials in November 2020. Pfizer had to complete this before being authorised for emergency use by the U.S. Food and Drug Administration. This means that for the general population (non-pregnant adults), the necessary trials were completed for vaccine authorization and approval.

It then took the FDA a while to process all of that data and put it through their authorisation systems for full approval which it has now done. This means it has been confirmed to be safe based on the data from the trials and since then over 6.41 billion COVID-19 shots have been given (not all of those are the Pfizer vaccine).

Whenever you can study people, you will always try to learn more for as long as possible. Some of the volunteers in the phase 3 trial offered to continue on to another trial so a phase 4 study was started which will run until January 2023. This is a great way to gain information on things like how long immunity lasts in different people over a few years.

Phase 4 studies are part of the post-marketing surveillance and not required for vaccine authorization or approval. It is standard procedure for safety monitoring to continue after vaccines have been approved for use. Since then new clinical trials have been carried out on pregnant women, teenagers and trials are just finishing up on children under 12.

Myth 2: There is no long term safety data

The mRNA vaccine has been researched and tested for over 10 years, so while it has only been used for COVID-19 recently, previous versions have been tested for rabies, HIV and Ebola. Vaccines are designed to only interact with the body for a very short period of time before being flushed out. In the case of the Pfizer vaccine, the only active ingredient is mRNA and this is destroyed within days and flushed out within a couple of weeks, so any side effects would be assumed to be while the vaccine components are inside the body which is less than a month. The only long term effect that the COVID-19 and other vaccines usually have is an increase in the ability of your immune system to recognise and defend against a pathogen.

Myth 3: The vaccine was rushed

There is a difference between quick and rushed. The vaccine was developed quickly but no shortcuts were taken. The reason why the vaccine was able to be developed so quickly was money, focus and pre-existing work.

With huge investment, enough researchers and facilities, new medicines and vaccines can be developed very quickly. However, usually a researcher will start with some initial funding to try a small project, it can take a month to write this funding grant which may not be approved for several months.

Once they complete their initial findings, they then need to find a bigger funder to fund more research, which takes time, and this continues. Funders tend to fund things that are needed by many, so COVID suddenly opened up a whole bunch of funding that wasn't available before and that was targeted to this issue.

Another thing that was super lucky was all of the mRNA research that had been done over the last 10 years for Rabies, HIV and SARS (on tiny pockets of funding). Sadly the money and focus hadn't been enough as the original mRNA vaccines were focused viruses which don't have a huge market. However, as soon as there was money in the pot, this foundational research was ready to go and scientists didn't have to start from scratch.

Clinical trials were also able to recruit large numbers of volunteers much faster than usual, and find people who had the virus to compare them to. This is not easy in less common viruses like Ebola where you might only have a few cases of patients you can use to study.

Because of the global concern about COVID-19, some clinical trials could be done with a bit of overlap because they could recruit enough people into the trials. Previously one trial would end before the next one started as it's usually difficult to convince people to inject an unknown fluid in their body.

These huge numbers of volunteers for the clinical trials meant they could quickly determine whether the vaccine was effective in a short amount of time – under normal circumstances it might take years to find enough people.

Large manufacturing plants were also developed in advance, so vaccines could be produced faster and on a larger scale than was previously possible. The vaccines have been developed very quickly but without taking any shortcuts in the necessary processes or compromising safety. All three phases of the clinical trials tested for the same safety issues that other vaccines have had to go through and in the same way.

Myth 4: The vaccine is genetically modified

The AstraZeneca, Johnson and Johnson and Sputnik V vaccines are fully “genetically engineered”, however, the mRNA Pfizer vaccines that we have in NZ just carry carrying genetic information for the synthesis of the “spike protein” and don't genetically modify humans - nor do they create any genetically modified organism.

Myth 5: The vaccine will modify my DNA

There is a crucial difference between mRNA and DNA. mRNA is active in the cytoplasm of a cell, whereas DNA is protected in the centre of our cells in a place called the nucleus. The mRNA can NOT enter the nucleus, so the two nucleic acids are never in the same place in the cell. mRNA is not DNA. DNA, which makes up our genetic code, is larger, double stranded and very long.

Myth 6: You can get COVID and spread it so it's pointless

The rate that you spread COVID if you do become infected after vaccination is much less than if you weren't vaccinated so the risk of you infecting another person is tiny. Being able to spread a small amount of the virus is different to spewing out a huge viral load which is what unvaccinated people do. Taking the vaccine not only protects you from potentially getting seriously ill, but it also protects those around you. Your R rate unvaccinated is 6, when vaccinated this drops to 1 (Delta).

Myth 7: The vaccine might make me sterile

There have been tens of thousands of healthy babies born to people overseas who had the vaccine before conception and several scientific studies showing that the vaccine has no effect on fertility in both men and women <https://www.sciencedirect.com/science/article/pii/S2666334121000684>

Myth 8: If I'm healthy and fit and eat well I'll be able to handle COVID if I get it. Only the old and sick die.

You won't know that until you get COVID - there have been plenty of 'health nuts' that have died from COVID overseas. It's not about how fit you feel, it's about the ability of your immune system to respond to something it's never seen before. There are two reasons for getting the vaccine, one to help protect yourself and the other to help protect others. When you are vaccinated you are less likely to harbour the virus if you catch it and spread it on to

others. This means that you can help to protect those members of society who can't be vaccinated right now (children and some people with medical conditions).

The second reason is that if you are infected with the COVID-19 virus, you are still at risk of being severely affected by it, and these can be very long term effects (known as long COVID) which could affect your ability to work long term. While many of the deaths associated with COVID-19 are reported to be in people with pre-existing conditions or the elderly, severe illness caused by COVID-19 can happen to anybody and result in long term damage of the brain, lungs and heart tissue. There is no predictive model as to how severe your symptoms will be or how long they might last if you are infected with COVID-19, but we do know that it affects all types of people including those who are fit and healthy. The vaccine will reduce your risk of the virus being able to infect you and thus reduce your risk of illness and long term effects.

Myth 9: I'm worried about side effects - I have heard of some people getting very sick after having it.

It's OK to be afraid of the side effects, but it might pay to chat to others who have had the jab to ask them about their side effects. For me, my only side effect was a sore arm for 8 hours, this has been the same for most of my friends. Some others might feel a bit run down for a day after their vaccine, but they planned for that and had a nice chilled day in bed watching movies and eating snacks. The other thing you should be scared of is the symptoms if you caught COVID-19, it might be worth weighing those up and deciding which you could cope with better. There is no way to know how mild or severe your symptoms would be with the virus, but for the majority of people the side effects of the vaccine are very mild.

Myth 10: People have died from the vaccine and it's being covered up - is this true?

All of the information is public and available at <https://www.medsafe.govt.nz/COVID-19/safety-report-29.asp#death> with the most recent data showing the summary of reported deaths up to and including 18 September 2021 reported to CARM after the administration of the Pfizer vaccine. Following medical assessments by CARM and Medsafe it has been determined that:

- 27 cases are still under investigation.
- 1 death was likely due to vaccine induced myocarditis (awaiting Coroner's determination)

This is after over 5 million doses have been given.

One thing we have to remember is that there are deaths every single day, in all age brackets that occur for a variety of reasons, some pre-existing medical conditions, some unexpected.

Now when people get the vaccine and there are deaths, the coroner has to determine if there were just a death that would have happened anyway or if the death was vaccine related. There is a whole investigative group dedicated to looking into that and when suspicious include autopsies to determine cause of death.

All of this data is public, the most recent dataset is here [Safety Report #30 – 25 September 2021 \(medsafe.govt.nz\)](#) shows the summary of reported deaths up to and including 25 September 2021 reported to CARM after the administration of the Pfizer vaccine.

It shows that there have been 75 deaths reported in people who have had the vaccine.

Now what's important here is that this doesn't mean the vaccine caused their death, it just shows that people have died, and people have also had the vaccine.

If you compare this to previous years' data, the report states that "To date, the observed number of deaths reported after vaccination is actually less than the expected number of natural deaths."

So less people on average have actually died after the vaccination rollout.

Anyway all of these deaths are investigated and right now following medical assessments by CARM and Medsafe it has been determined that:

- 27 of these deaths are unlikely related to the COVID-19 vaccine
- 14 deaths could not be assessed due to insufficient information
- 33 cases are still under investigation
- 1 death was likely due to vaccine induced myocarditis (awaiting Coroner's determination)

The death was well reported and made public as soon as it happened and an autopsy took place. The person was a woman in her 50's who had some serious pre-existing conditions and was in the high risk category for vaccine reaction. I remember hearing about her health challenges at the time and it being discussed on the radio by Dr Ashley Bloomfield.

When it comes to vaccine injuries, the VAERS system is how vaccine injuries are reported and anyone can use the system and anyone can input anything that they like into the system. However all of the reported side effects have been uploaded and are available for everyone to see. That same link above shows the top side effects are Dizziness, Headache, Injection site pain.

Even if there were 757 serious injuries from the vaccine (I haven't fact checked that number), considering that we have had over 5 million doses of the vaccine in NZ that put the odds of a serious injury from the vaccine at 0.000002%. Way below the risk of serious injury of most things that you do every day including driving a car and crossing the road.

Myth 11: We should wait to see if there are long term side effects

Vaccines are designed to only have a short term interaction with the body that helps the immune system to train itself by being exposed to something new. In the case of the Pfizer vaccine, the active ingredient is mRNA which is broken down by the body within days. There are no lingering ingredients left in the body so there are unlikely to be long term effects for mRNA vaccines based on the ingredients. What the mRNA does is help your immune system recognize the spike protein of a COVID-19 virus, and remember it. That is the only long term effect and the one that vaccines are designed to do – help with immunity.

Studies have been going on for around 10 years on mRNA vaccines so we do know quite a lot about it, and to date the only long term effect is increased immunity. We also have data on previous vaccines, many of which you may have been given as a child that don't show long term side effects.

FAQs:

Q: Will this vaccine work against new strains?

The current vaccine is designed to teach our body how to recognise and attack anything that has a specific spike protein on it. This spike protein is what the COVID-19 virus uses to hook onto and enter our cells. All strains of the virus so far have this type of spike protein and so the vaccine can be used against these variants. The virus would have to change significantly and become quite different than it is now if it isn't going to use the only attachment mechanism it has of a spike protein, so hopefully this vaccine will continue to be effective against the virus and its strains.

Q: Highly vaccinated countries still have high case numbers of COVID - why?

Data from UK hospitalisations and deaths show very clearly that the benefits of the vaccine means you are 96% less likely to be hospitalised and 98.8% less likely to die from COVID-19 if you are infected. Also workplace testing in places like the healthcare sector mean vaccinated people can test positive for the virus without being symptomatic, or even knowing they were positive. A positive vaccinated case is very different to a positive unvaccinated case and the risk to the community is much, much lower. Some countries vaccinated a long time ago and are now seeing breakthrough infections in patients with weakened immune systems (elderly and immune compromised people) which is why they have rolled out booster shots.

Q: Why can't we just take drugs to stop the effects of COVID like the monoclonal MSD drug rather than a vaccine?

We can, but they aren't 100% effective and there aren't enough drugs to go around. Also depending on the stage of infection that you are at, the drugs may not prevent you from suffering from long term damage from the infection that you did get before it was treatment. The vaccine also helps to protect others around you as it significantly reduces transmission of the virus in the community especially for those who are vulnerable with current health issues who are unable to take the vaccine or the treatment drugs.

Q: The dose for a small child is the same as for an adult why is this and is it safe for my kids?

Clinical trials for the vaccination of under 12's has just completed and the dosage suggested is one third of the dose that an adult gets.

Q: If kids don't transmit the virus why should we vaccinate them?

Kids do transmit the virus, they just transmit it less than adults. Transmission of COVID has occurred in schools in NZ and globally clusters have been reported in all types of school settings (preschool, primary and secondary school). This means that children can transmit COVID.

Most children do not develop symptoms when infected with the virus, or they develop a very mild form of the disease. However, research has shown that children can become infected, and can spread the virus to other children and adults while they are infectious.

Q: Should pregnant women take the vaccine

Yes! If you are unvaccinated and pregnant you are at a much higher risk if you contract COVID-19. The CDC has just released an alert for pregnant women after new research shows that there is a 70% increased risk of death for pregnant people who catch COVID-19. The clinical trials on pregnant women showed no effect of the unborn child or any changes in the outcomes of the pregnancy.

Q: What is in the vaccine?

The ingredients are listed below and just like when you read the back of a packet of Pringles, some of them are quite scientific in their name. I've tried to explain each one:

- mRNA – this is the active ingredient and includes the instructions to help your cell make a COVID-19 spike protein for your immune system to train itself on.
- lipids ((4-hydroxybutyl)azanediyl)bis(hexane-6,1-diyl)bis(2-hexyldecanoate), 1,2-Distearoyl-sn-glycero-3-phosphocholine, and cholesterol) – these are oils or fats and used as a protective cushion that goes around the delicate mRNA molecule so it isn't damaged as it's being injected.
- 2 [(polyethylene glycol)-2000]-N,N-ditetradecylacetamide this is used as a protective coating that goes around the delicate mRNA molecule.
- potassium chloride, monobasic potassium phosphate, sodium chloride, dibasic sodium phosphate dihydrate – these are salts and used to buffer the pH of the solution so it's the same as your body fluids.
- Sucrose – this is sugar and used to stop the mRNA molecules from losing their shape during the intense freezing process.
- Water – this is the carrier that everything is held in.

Q: How does the vaccine work?

The Pfizer vaccine that we have access to in New Zealand is classed as an mRNA vaccine. There is no COVID virus in this vaccine. mRNA is a messenger molecule made by your body that gives ribosomes in your cells instructions on how to build things. mRNA molecules don't last very long, usually hours or days before they are destroyed so these instructions are temporary. The Pfizer vaccine injects mRNA that have the instructions to build a spike protein that is the same as the spike protein on the outside of the COVID-19 virus. Your ribosomes read the instructions, follow them and build a spike protein of their own. Your immune cells then see this spike protein and recognize it as something that shouldn't be there and destroy it.

At the start, this will be the first time your immune cells will have come across this type of protein so they won't have the best tools to destroy it, but as they try different things eventually something will work really well and your immune cells will create a memory of that. The next time they come across this spike protein they will be much more efficient at destroying the spike protein. The Pfizer vaccine is given in two doses, the first lets your immune system try and learn new ways of attacking the spike protein, the second gives it practice and time to perfect on what it learned the first time. After your second dose your immune system is now ready to do the same if it encounters that spike protein again, which may be from you being exposed to the virus. This vaccine means that you never have to be exposed to the COVID virus to be protected from it and is different to how some other vaccines like the MMR vaccine work which do use weakened live viruses.