

- Vaccination

Vaccinating against fake news

Myths and facts surrounding the Covid-19 vaccines

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The second Covid-19 vaccine was just approved. Things are really looking up! The Moderna vaccine looks very good based on recently released data. It has shown a 94.5 per cent efficacy in preventing symptomatic disease, and an astounding 100 percent efficacy in preventing severe disease. There's a bonus too, in that the vaccine also seems to prevent asymptomatic disease. If this is confirmed, it will be big news to doctors and public health experts. It means that there is at least one Covid-19 vaccine that can block transmission. If enough people are given a transmission blocking vaccine, herd immunity can be achieved and the disease can be eliminated.



While many people are rejoicing at the early Christmas gift of safe and effective Covid-19 vaccines, pseudoscience trolls and antivaxxers are also working overtime. Worst of all, some of these people are doctors or scientists who for one reason or another are spreading inaccurate information.

Let's go through some of the facts that have stirred controversy.

1. RNA vaccines do not affect the vaccine recipient's own genetic material.

Pfizer/BioNTech and Moderna use RNA as the active ingredient for their vaccines. RNA is an intermediate molecule used by the human body to transfer genetic information from DNA, translating the genetic code into protein products. RNA also happens to be the genetic material of the coronavirus. Humans can make RNA from DNA, but we cannot turn RNA into DNA. Therefore, any RNA that is introduced into the body by a vaccine cannot be naturally turned into DNA. RNA from the vaccine cannot incorporate itself into human genetic material.

Another safeguard against a Frankenstein-like scenario is the fact that the RNA introduced by the vaccine only codes for a portion of the SARS-CoV-2 virus. It does not contain the entire RNA sequence to make a complete virus. The specific RNA sequence in the vaccine contains the information for making the spike protein of the coronavirus. The spike protein is the material that make up the knobs on the coronavirus surface. The virus uses these knobs to enter our body's cells. The RNA from the vaccine is picked up by the vaccine recipient's cells, and a lot of coronavirus spike protein is produced. The RNA does not enter the nucleus where DNA is stored and only interacts with the parts of the cell in its cytoplasm. Only the spike protein is produced, not the entire virus. The body recognizes the spike protein as foreign, triggering production of antibodies and immune cells. When the real coronavirus shows up, the antibodies and immune cells generated by the vaccine can readily recognize it. The infection resolves quickly or doesn't take hold at all. This is how RNA vaccines work.

2. The vaccine took 17 years to make. Safety steps were not skipped.

Some doubt was cast on the safety of the current vaccine frontrunners due to the speed at which they were tested and manufactured. Prior to this, the fastest time to vaccine development was four years for the mumps and Zika vaccines. A lot of the vaccines are based on previously developed technology and repurposed SARS and MERS vaccines. To save time on testing Covid-19 vaccines, phase I, II, and III studies were sometimes done with overlapping time frames rather than in sequence. Larger and larger populations were enrolled for each phase. Despite the urgency of the matter, the US FDA still required at least two months of safety data from tens of thousands of patients before considering a vaccine for review. These patients will be followed for any potential longer-term side effects even after the vaccine is approved. If some long-term issues arise, these will be tracked. Last week's column has the details of the vaccine development process.

Allergies and idiosyncratic reactions have been reported, but the risk of a bad reaction to the vaccine is very, very low. When the vaccine eventually gets here, doctors and patients should have a thorough discussion on the risks and benefits of vaccination. This is doubly important in people with a history of allergies or bad reactions to any vaccine in the past. In almost all cases, the risk of death or a severe reaction to the vaccine is much, much less than the deleterious effects of Covid-19. Taking the vaccine with adequate medical supervision further lowers the risk of a bad outcome.

3. Vaccines are tested for their ability to prevent symptomatic disease. They will decrease transmission too.

Some misinformation circulating on the internet implies that though the vaccine can prevent symptomatic disease, it cannot prevent transmission. Prevention of symptomatic disease is clinical efficacy. Clinical efficacy is the standard by which vaccines are initially measured. People with symptoms are 10 to 20 times more likely to transmit Covid-19 than asymptomatic patients. When symptomatic disease is prevented, then there is less transmission. It is easier to prove that a vaccine prevents symptomatic disease, but it is more difficult to prove that it blocks transmission. There are studies out to prove transmission blocking effects using antibody levels and transmission dynamics. The ability to prevent clinical disease and the ability to prevent transmission are not mutually exclusive.

A recent viral Viber post from a doctor in the US pointed out the supposed hazards of the new RNA-based vaccines. He boldly declared that he would rather take his chances with the virus than take the vaccine. A quick search of his name on Google revealed past malpractice convictions and revocation of his license for putting patients in danger with medical incompetence and unproven treatments. Many doctors outside of mainstream medicine are still insisting on using hydroxychloroquine. Some are still pushing for “natural herd immunity” from mass infections despite the fact that Sweden, the country touted as the prime example of this, is now going into lockdown.

There are many more misleading rumors out there. Self-protection starts with fact checking before believing and sharing. Though the vaccine is one means of ending the pandemic and is a beacon of hope, there are still some people who think this is all a big conspiracy. There are 1.7 million people dead. It will be much more than that if the anti-science rhetoric continues, and people continue to give it life by sharing fake news.

Three former US Presidents have expressed their willingness to be among the first to take the vaccine to boost confidence. US president-elect Joe Biden will be receiving the vaccine this week. This writer hopes to receive the vaccine soon, too. It's just too bad there isn't a vaccine against fake news.

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