

Debunking Vaccine Myths



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The SARS-CoV-2 virus which causes Covid-19 has infected more than 444 million and killed an estimated 6 million people globally. The rollout of the world's largest vaccination programme in history since December 2020 has largely been successful in mitigating the pandemic.

The unvaccinated are 43 times (Malaysia-MOH) and 97 times (US-CDC) more at risk of dying from Covid-19 compared to the vaccinated. Patients who received booster shots are 90 percent protected from being admitted into the hospitals, ICUs or deaths, thus preventing the healthcare facilities from being overwhelmed as had happened with the Delta wave.

About 97.4 percent of Malaysian adults have had two doses and 63.5 percent have had their booster dose, which has conferred the country a very powerful immunity wall to face the threat of the Omicron variant and empowered the nation to now experience some form of near normalcy in terms of our day-to-day social activities, a resurgence of our national economy, and contemplates opening our borders to the world.

Despite the extraordinary efforts and major advances made to make the nation safe and secure, there remains a faction of disgruntled anti-vaccine persons and NGOs who are fear-mongering and generating misinformation about the safety of the Covid-19 vaccine, in particular the mRNA vaccines.

MRNA vaccine does not alter DNA

A lease of life was handed to these few loud anti-vaxxers with a recent publication of a study that purportedly claims that the mRNA vaccine can be converted to DNA inside a human cell via a process of reverse transcription.

This laboratory study from Lund University, Sweden has generated excitement amongst the anti-vaxxers, claiming that the BNT162b2 (Moderna vaccine) can be reverse transcribed to DNA in a liver cell line known as Huh7.

The idea that vaccines can permanently alter your DNA is actually not new. It dates to the time of the first smallpox vaccine in 1796. Soon after its introduction, cows were caricatured growing from the human anatomy, suggesting that the human body had been altered by the vaccine.

The Pfizer-BioNTech and Moderna vaccines work by instructing our own cells to produce viral proteins, in this instance the spike proteins which are then recognised by our immune system as foreign, which in turn triggers the production of long-lasting antibodies, B and T cells that form the defence against future infections with SARS-CoV2.

The virus SARS-CoV-2 is an RNA virus, which does not have the means to produce a DNA transcript or integrate itself into a host's genome. Likewise, it is not biologically possible for the mRNA of the Moderna and Pfizer vaccines to be reverse transcribed into human DNA.

Secondly, the vaccine mRNA and human DNA reside in two different compartments of the cell. Our DNA stays in the nucleus whilst the vaccine mRNA is only delivered by the nanoparticle into the cytoplasm, never entering the nucleus. There are no transporter molecules that can direct the mRNA into the nucleus.

Thirdly, this petri dish experiment used cancer cell lines (Huh7 was derived from liver cancer) that behaves very differently from normal cell lines and are not representative of normal human cells.

The Huh7 cells used in this laboratory experiment produces an enzyme called the LINE-1 enzyme, which is a reverse transcriptase that converts mRNA into DNA. Although normal human cells do contain the LINE-1 gene, it is not expressed.

In other words, regular human cells do not produce the LINE-1 enzyme to perform the reverse transcription necessary to convert the RNA to DNA.

Furthermore, a laboratory study is not a clinical study and cannot be extrapolated to make any conclusion about what happens in a human body.

Fourthly, the Swedish investigators used abnormally high amounts of vaccine in their studies, which is non-physiological. They injected 2 microgrammes (mcg) for 200,000 cells, which is very excessive when the physiological dose in the mRNA vaccine is 30mcg for the entire human body (30 trillion cells, 30,000,000,000,000).

Finally, a close analysis of the study shows that the investigators did not provide any evidence of genome integration as claimed. No test was undertaken to confirm integration into the cell DNA.

In actual fact, in concluding the study, the authors pointed out that their study does not show that the Pfizer vaccine integrates with the liver cell DNA or alters it in any way.

Anti-vaxxers cherry-pick information that suit them

A pattern observed with anti-vaxxers is their propensity to be very selective and cherry-pick bits and pieces of research to sensationalise their ulterior motives.

A second issue that has created a lot of fear and confusion, particularly with the vaccination programme in children and adolescents is the occurrence of serious side effects.

The latest and largest dataset from the US CDC on adverse events following immunisation (AEFI) on the use of mRNA vaccines in children 5-11 years old following 8.7 million doses of the Pfizer vaccine administered shows that the only major AEFI was myocarditis, of which 11 cases were reported. All the children recovered fully after two to seven days.

In contrast, the risk of developing myocarditis in a child with Covid-19 is 36 times more than that due to the mRNA vaccine or approximately 450 per million with the cases being clinically worse than those caused by the mRNA vaccine.

Covid-19 also causes a severe form of the disease called Multisystem Inflammatory Syndrome in Children (MIS-C), often requiring care in the ICU and may cause deaths. This complication occurs in 1 in 3,000 to 4,000 children who have had Covid-19 infection. If a child suffers from MIS-C, myocarditis is found in 75-100 percent cases of MIS-C.

Our National Pharmaceutical Regulatory Authority has also shown that the mRNA vaccine is safe in children from 5-11 years of age. Up until Feb 18, 2022, 383,000 vaccine doses have been administered with only 37 non-serious AEFI reported.

The main AEFI reports were acute stress response, fever, rash and difficulty breathing. There was only one report of a serious AEFI. The child was admitted and later discharged well.

At the end of the day, it is about parents and guardians making informed choices. Unfortunately, it is not a zero-risk choice. But the science and evidence show that a 5-11-year-old child is at the highest risk of developing myocarditis if they get MIS-C.

Efficacy trials in children 5-11 years old have shown that the mRNA vaccine is highly effective in preventing Covid-19 with an efficacy rate of 91 percent.

Current trends show vaccine effectiveness

To date, close to 80 percent of the Malaysian population have received two doses of the vaccine including 30 percent of children between the ages of 5 and 11 years with one dose of the mRNA vaccine.

Despite recording more than 30,000 daily cases in recent weeks, the number of severe cases and deaths have remained relatively low. However, we cannot be complacent as progress with the booster dose has been relatively slow, with only 63 percent of the population having received a third dose.

We only have to look at Hong Kong, which is battling a surge of Covid-19 infections that is overwhelming their health system. The severe disease and deaths in Hong Kong have been

attributed to a relatively low vaccination coverage amongst the vulnerable population, especially the elderly.

Contrary to popular belief mRNA vaccine technology is not brand new, only developed over the past two pandemic years. Research on mRNA vaccines for infectious diseases including Zika, flu and rabies as well as for use in cancer has been ongoing for nearly two decades.

There are presently at least nine mRNA vaccines in phase 1-3 trials, including for influenza, rabies, varicella, human Zika and Nipah viruses. The most recent addition being the mRNA-HIV vaccine in phase 1 trials.

On the back of this voluminous research and scientific knowledge, we have witnessed the rapid and unprecedented development of two of the world's most effective vaccines against SARS-CoV-2 made possible by global scientific collaboration and massive financial investment.

Both the mRNA vaccines underwent standard rigorous safety and efficacy trials prior to its approval for emergency use authorisation (EUA) by international agencies such as the World Health Organization (WHO) and national regulatory agencies (e.g. US FDA, Europe's EMA, Malaysia's NPRA) have licensed its EUA for selected high-risk groups.

To date, 10.8 billion doses of mRNA vaccines and other Covid-19 vaccines have been administered, making it one of the greatest historical milestones in science and medical research and clinical applications.

As healthcare professionals who are directly or indirectly involved in caring for those who have been infected and affected by Covid-19 since January 2020 and throughout this pandemic, we are extremely frustrated and disappointed by the antics of a few of our colleagues who are lending their voices to the anti-vaccination groups.

It has to be said that some of these so-called experts are neither specialists in the field nor have they been hands-on in the management of the Covid-19 pandemic to date. Their noisy protest against the mRNA vaccines is devoid of any scientific rationale but only serves to generate more fear and confusion amongst the lay public.

The authorities must take stern actions against these few anti-vaccine activists who continue to alarm the public with fear-mongering, fake news and misinformation. Their irresponsible actions will only derail the progress of our nation in combating the coronavirus, lead to more morbidities and mortalities of the unvaccinated adults and children and frustrate the national interest to exit the pandemic safely and securely.

This letter is endorsed by the following organisations:

1. The Malaysian Medical Association
2. The Academy of Medicine
3. Faculty of Medicine, Universiti Malaya

4. Academy of Professors, Malaysia
5. Association of Private Hospitals Malaysia
6. Malaysian Pharmacists Society
7. Malaysian Paediatric Association
8. Malaysian Society of Infectious Diseases and Chemotherapy
9. Islamic Medical Association of Malaysia
10. IKRAM Health
11. Medical Mythbusters Malaysia
12. College of Anaesthesiologists
13. Malaysian Health Coalition
14. Association of Malaysian Optometrists

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