COVID-19 vaccines – changing perspectives

2020 changed our lives. For too many it was the end of their life. For all of us, it heralded a new reality. During 2020 my social media feed was full of people wishing the year would end. I thought that little would change. The virus was not suddenly going to disappear. However, unprecedented advances in vaccine science meant that we now have a new weapon with which to fight the virus – and not just one, but several, all of which have proven efficacy against SARS-CoV-2, albeit with differing levels of effectiveness against mild disease, but most appearing to provide pretty good protection against severe disease and death. Hold that thought.

After a lot of fiddling about, our government finally took the task of vaccine procurement seriously, and many of the concerns and criticisms that I,[1] and our major infectious disease and vaccine experts,[2] were levelling at government have now been addressed. And all seemed to be about to happen, albeit with continuing concerns about roll-out beyond the 'first phase' to front-line health workers. But then, the sting in the tail – the variants, of which there are many, but of particular concern here with the spread of 501Y.V2, the so-called South African variant. By now I am sure everyone knows that a small trial with relatively young volunteers has shown that the AstraZeneca vaccine, which was about to be rolled out to our health workers, only offers around 22% protection against mild disease caused by this variant.[3] Protection against severe disease and death in these cases is not yet known. However, we do know that the vaccine is safe, and further studies may well show that there is still protection against severe disease and death. Our Minister of Health has subsequently assured us that we have sufficient access to the alternative Johnson & Johnson vaccine to administer it to our health workers on a research basis. This started on 17 February 2021 in Khayelitsha in the Western Cape, with the President and Minister of Health, along with front-line health workers, among the first to receive the vaccine. And our President publicly announced in his State of the Nation speech that 20 million doses of the Pfizer vaccine will be delivered from the end of March, 12 million of these from the COVAX facility.[4]

Another very encouraging sign is the reappearance of Professors Madhi and Gray on government platforms, signifying that finally our leading experts are being listened to. Hopefully, the Department of Health will now be led by science rather than by politics, at least as far as vaccines are concerned.

However, what is starting to become clear is a changing perspective around how to control COVID-19. The perspective around achieving herd immunity using vaccines is changing. The rapid emergence of SARS-CoV-2 variants around the world (and these are the ones we know about), in the UK, here in South Africa and in Brazil, makes it very likely that without full global vaccination, herd immunity may never be achieved. This is because of the spread of variants, which arise because of levels of population immunity that are too low to fully protect against new infections (and re-infections), but which are acting as drivers of mutations that allow the virus to escape that immunity, including in vaccines. In essence, new variants 'knock vaccine efficacy down a rung or two'.[5] So a vaccine that may originally have protected against infection with the original virus may now protect only against symptomatic infection. In other words, you still get a nasty dose of a flu-like illness. But, at the same time, these vaccines are likely to protect against severe illness and death in all but the most compromised of people. That seems like a pretty good outcome, given that global vaccination is all but impossible with the constraints resulting from the Global North buying up just about all the stocks of vaccines, and vaccine production and distribution failing to keep up with demand anyway.

The thinking now is that we will never achieve full herd immunity. Well, places like New Zealand might, but they will have to remain closed to the rest of the world for all time to sustain that. While this may be a scary prospect, given how COVID-19 has rampaged through the population in the past 12 months, there is a lot to be learned from looking at the biology of the other coronaviruses – the four that cause the common cold, in particular. A model developed by Lavine *et al.*[6] analysing the trajectory of SARS-CoV-2 into endemicity suggests that there will eventually be a shift in the age distribution of primary infections to younger age groups, depending on the speed of viral spread. Essentially, this model suggests that infection-blocking immunity wanes rapidly, but that disease-reducing immunity is long-lived. So we will end up with SARS-CoV-2 established in the population, but moving mainly among younger people, who are less affected, and, once the endemic phase is reached, with primary exposure in childhood, SARS-CoV-2 may become no more virulent than the common cold. We are still a long way from that. However, using vaccines that, while they may not prevent mild disease and so transmission of the virus, still protect against severe disease and deaths, is a very good start. Don't throw away the AztraZeneca vaccines yet, Dr Mkhize.

Bridget Farham
Editor
ugqirha@iafrica.com

1. Farham B. COVID-19 vaccines – the magic bullet? S Afr Med J 2021;111(1):3. https://doi.org/10.7196/SAMJ.2021.v111i1.15486
2. Gray G, van den Heever A, Madhi S, et al. The Scientists' Collective 10-point proposal for equitable and timeous access to COVID-19 vaccine in South Africa. S Afr Med J 2021;111(2):89-94. https://doi.org/10.7196/SAMJ.2021.v111i2.15498
3. Ellis E. How South Africa navigates the AstraZeneca Covid vaccine will have 'global repercussions'. Daily Maverick, 10 February 2021. https://www.dailymaverick.co.za/article/2021-02-10-how-south-africa-navigates-the-astrazeneca-covid-vaccine-will-have-global-repercussions/ (accessed 12 February 2021).
4. Merten M. Fynbos and aloe analogies aside, Ramaphosa's Sona 2021 signals tough times ahead. Daily Maverick, 12 February 2021. https://www.dailymaverick.co.za/article/2021-02-12-fynbos-and-aloe-analogies-aside-ramaphosas-sona-2021-signals-tough-times-ahead/ (accessed 12 February 2021).
5. Zhang S. What if we never reach herd immunity? The Atlantic, 9 February 2021. https://www.theatlantic.com/health/archive/2021/02/herd-immunity-might-be-impossible-even-vaccines/617973/ (accessed 12 February 2021).
6. Lavine JS, Bjornstad ON, Antia R. Immunological characteristics govern the transition of COVID-19 to endemicity. Science 2021;371(6530):741-745. https://doi.org/10.1126/science.abe6522

S Afr Med J 2021;111(3):187. https://doi.org/10.7196/SAMJ.2021.v111i3.15626