COVID-19: preparing for the next viral variant

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Global pandemics are inevitable, but their effects can be ameliorated by better health systems, education, and being prepared

The World Health Organization (WHO) reports that about 450 million people have contracted coronavirus disease 2019 (COVID-19), that nearly six million people have died, and that more than 10 billion vaccine doses have been administered.[1] In Australia, 2.8 million people have contracted COVID-19, more than 5000 have died,[2] and more than 54 million vaccine doses have been distributed.[3] The COVID-19 pandemic will continue, but Australia is prepared, with high vaccination and booster rates; 94.4% of Australians over 16 years of age have received at least two doses.[3] Unvaccinated older adults and people with other health conditions are at greatest risk of severe COVID-19.

We have already seen five major severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) variants of increasing infectiousness but with some reduction in disease severity. The Omicron strain dramatically supplanted the Delta variant around the world, and although the number of COVID-19 cases has rapidly increased, the case fatality rate has fallen.[4] In addition, several countries, including Denmark, have reported Omicron subvariants with greater transmissibility but seemingly unchanged disease severity.[4,5] Further variants can be expected as the virus evolves, but boosters and updated vaccines will ameliorate the effects of any new waves of infection.

With Omicron infection rates already having peaked in Australia, some precautionary restrictions must be retained, such as mask wearing in settings of high transmission risk, hand hygiene measures, and limits on large gatherings, to minimise the number of hospitalisations and to protect people with waning or no immunity. While strict lockdowns initially stemmed the tide of COVID-19, the effectiveness of this approach cannot be maintained indefinitely, as highly infectious novel viral variants predominantly cause mild and subclinical infections, expediting person-to-person spread. Moreover, lockdowns are detrimental to economic and social life, and also impinge upon other critical and preventive medical care. While restrictions applied for long periods suppress numbers of cases and deaths, lockdowns should be strict and brief in order to slow virus spread acutely, allowing time to produce diagnostic tests, assess treatments, and manufacture vaccines.[6,7]

Are we prepared for the next pandemic? The WHO was slow in declaring the COVID-19 pandemic, leading to hesitation in responses around the world. Further misdirection resulted from the mistaken early belief that the dominant mode of spread of SARS-CoV-2 involved fomites rather than respiratory droplets.[8] Australia was one of the first countries to recognise the pandemic potential of SARS-CoV-2 and rapidly implemented border controls, quarantine measures, and other restrictions.[9]

Timely uploading of SARS-CoV-2 sequences to the GISAID database (https://www.gisaid.org) enabled the production of diagnostic tools and vaccine development to begin. These are the first responses to any pandemic. Global surveillance of novel zoonotic infections with pandemic potential, such as severe acute respiratory syndrome, Middle East respiratory syndrome, and influenza viruses (especially the H5, H2, and H7 influenza subtypes) is well managed by the WHO Global Influenza Surveillance and Response System (GISRS) network,[10] and other global surveillance systems can also alert nations when zoonotic viruses with pandemic potential are identified.[11]

Vaccine development and manufacture is the next vital step in our pandemic response. Australia will soon establish manufacturing plants for mRNA and protein vaccines,[12] and Seqirus (the vaccine division of CSL) will continue to play an important role. This is vital if we are to respond quickly to novel viruses, and could also assist countries in our region and beyond, as it is clear that only by vaccinating people in all parts of the world will we contain new variants. Wealthy countries, including Australia, could not only donate surplus vaccine doses but increase their support for the COVID-19 Vaccines Global Access initiative (COVAX),[13] which aims for equitable allocation of vaccines and related support instead of relying on bilateral donation programs. Both UNICEF and Médecins Sans Frontières fear that low income countries are facing tragedy; by September 2021, there had probably been three million COVID-19 deaths in India, for example, six times the official figure.[14] Indonesia has a population about ten times that of Australia, but has had about 1000 times as many COVID-19 deaths in children, with poverty and malnutrition important factors.[15]

Low vaccination rates in low income countries reduce protection from the virus and allows variants to emerge and circulate, to continue to threaten lives and livelihoods. Strategies are needed to refute misinformation about COVID-19, often spread by anti-vaccination activists, to overcome vaccine hesitancy and improve uptake, and to improve the availability of diagnostic tests and

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treatments. By mid-January 2022, the population vaccination rate in 36 of 194 WHO member states was lower than 10%, in 88 lower than 40%, and in 59 greater than 70%.[16]

The only way out of the pandemic is to face it as a global community. Supplying vaccines is good, but countries must also have facilities for storing and transporting them, trained health staff, personal protective equipment, and educational materials. It is the combined and holistic role of governments, private companies, and individuals to do what they can to end the emergency.

Global pandemics are inevitable, but their effects can be ameliorated by investing in better health systems, education, and preparedness. In future pandemics, expert communications should be unifying and authoritative rather than divisive; the media should report accurately and with less sensation; the public should place their confidence in science and not social media; global institutions should act promptly and base their decisions on data, not speculation; and we should have a developed manufacturing capacity for diagnostic tools, personal protective equipment, and vaccines. Australia will continue to have a role in the surveillance of zoonotic viruses, with a strong regional focus and a global outlook. A single Australian National Centre for Disease Control, as proposed by the Australian Medical Association,[17,18] should also be pursued, as it would provide a national focus on emerging disease threats, health security, epidemiology, and research.

Despite the success of COVID-19 vaccines, not only will new SARS-CoV-2 variants probably continue to trouble us, but other coronaviruses and influenza viruses will cause further pandemics in the future.

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