



What does the novel coronavirus epidemic mean for New Zealand?

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This blog post reproduces a *Sunday Star Times* opinion piece (26/1/2020) by this author on the current coronavirus situation. It also explores what New Zealand might do in response to protect both its own citizens and people living in those Pacific Island nations where the major transport links are through New Zealand airports.

The emerging coronavirus outbreak has tragic consequences for vulnerable populations in its path, but also has potential to unlock the best in international collaboration in science and public health. Unlike armed conflict, here we are fighting an external threat to global health where collaboration and sharing of information benefits all nations. Here I briefly summarise the questions we need to answer about this new threat, how information is shared globally, what this event might mean for New Zealand, and how we can reduce its

potential impact on this country and our Pacific neighbours.

The big questions we need to answer

By definition, new infectious diseases are an unknown quantity. When they emerge, there are three big questions we need to answer when assessing their pandemic potential: How harmful? How transmissible? How controllable? Some diseases, like rabies, are very harmful but not usually transmissible between people. Others like measles are harmful and highly transmissible, but also controllable with high vaccine coverage. Pandemic influenza by definition ticks all the boxes by being harmful, transmissible and difficult to control, hence its position as the world's major pandemic threat from natural sources.

With the novel coronavirus (2019-nCoV) that emerged in Wuhan at the end of 2019 we are learning more about its pandemic potential with every passing day. The most important measure of severity is the fatality risk. Currently this is about 4% based on 1,072 confirmed cases in China and 41 deaths recorded at the time of writing. It is clearly a serious infection for those who are elderly and have underlying illness, with many cases hospitalised with severe pneumonia.

This coronavirus is obviously transmissible between people with an exponential increase in cases over the four weeks since it was first detected. Transmissibility is summarised by the reproduction number, which is the number of people typically infected by each case. Early figures reported by the World Health Organization (WHO) suggest a reproduction number of between 1.4 and 2.5 – which suggests that every case detected is typically infecting two other people. But this number may go down with preventive measures and faster isolation of cases.

The biggest unknown is how controllable it will be. This is the extent to which transmission can be prevented by easily available methods such as case isolation, contact tracing, and quarantine (there is currently no vaccine and no specific treatment for coronaviruses so these interventions are not available). So far this coronavirus has continued to spread despite initial control efforts in China. It therefore ticks all the boxes for being a potential pandemic threat. The whole world now watching to see if the massive effort now being taken by China is successful in dampening down transmission sufficiently to control this epidemic.

Global collaboration

The world has come a long way since the severe acute respiratory syndrome (SARS) coronavirus pandemic in 2002-3. Then China delayed reporting this emerging infection for several months, hindering an effective response and resulting in severe negative economic consequences for the country. That pandemic was a major stimulus to acceptance of the International Health Regulations (IHR) which in 2005 were adopted by all 193 member states of WHO. Under the IHR all WHO members are required to rapidly report potential emerging health threats such as this novel coronavirus, particularly where they pose a risk of international spread, which is clearly the situation here. China was quick to report this new coronavirus and has been reasonably transparent in reporting its progression and disseminating scientific data about it.

Another key component of the IHR is what comes after a country reports a new event. WHO then assesses its potential to cause an international public health emergency (technically a Public Health Emergency of International Concern). Declaring such an emergency signals a

significant risk of global spread and the need for internationally coordinated control measures. WHO convened Emergency Committee meetings last week to assess this epidemic. They concluded that it had not yet reached the threshold to declare an international emergency but signalled they will meet again to reconsider this position as new information becomes available.

What this epidemic means for New Zealand

This epidemic is already having an impact on New Zealand that is likely to grow over time. There is grief and worry for those at the centre of the epidemic in China. There is the risk of imported and sustained disease in this country. And also the economic impact that is already being felt in financial markets and may affect tourist flows to New Zealand.

Of these concerns, the threat of importing disease to New Zealand is probably receiving most attention, as it is one risk that we have the ability to manage. It is stating the obvious to say that we live in a highly connected world with most countries just one or two flights away from China. If spread continues to occur we are likely to see imported coronavirus cases in New Zealand, just as such cases are being detected in Australia and a growing number of other countries.

The future course of this epidemic (or pandemic as it may become) is of course unpredictable. New Zealand is fortunate in having a number of advantages in combating this threat. Because of the IHR and China's greater openness in sharing information, we have the most important defence of all, which is knowledge about the nature of this threat. There is a laboratory test that can confirm cases. We know it's a coronavirus and, if it behaves like SARS, it can be controlled with basic public health measures. Another protective factor for New Zealand is timing. Respiratory viruses of all sorts are highly seasonal and conditions in summer (eg, people spending less time indoors) reduce their transmission.

New Zealand has an established pandemic plan and experience with rolling this out during the last influenza pandemic in 2009. One limitation is that the 'keep it out' component of our pandemic plan remained under-developed. Our very small national and regional public health capacity could be easily swamped if a coronavirus epidemic became established here.

Another major challenge for New Zealand is to ensure it does not export this coronavirus to Pacific Islands where it could be devastating. Now is the time to be thinking about how to minimise this risk. The impact of an epidemic is not just determined by the microorganism, it also depends on the environment and population it infects. This was demonstrated by the recent measles epidemic that caused more than 2,000 cases in New Zealand without any fatalities. In Samoa the same virus has so far caused 5,707 cases with 83 deaths. One of the reasons for the much higher mortality in Samoa is access to high quality intensive care services in New Zealand that saved children who would otherwise have died from measles. As we have seen repeatedly in this country and globally, the impacts of emerging infectious diseases amplify social inequalities.

Reducing the threat to New Zealand and our Pacific neighbours

We can expect a lot more coronavirus cases and deaths in China. Current data are inevitably out of date as they reflect infections occurring 1-2 weeks ago. The usual incubation period is probably 5-7 days, there is then an interval of several days before people are sick enough to be seen and diagnosed, and even longer for severe disease and

death. We can also expect growing numbers of cases in other countries and probably new outbreaks in some, particularly in Asia. At that point, the WHO would probably declare this a public health emergency. We are likely to see imported cases in New Zealand though sustained transmission should be preventable with a vigorous public health response.

What is certain is a continuing period of uncertainty. Much of this comes down to the biology of the coronavirus and its continuing evolution as it passes through a succession of human hosts. Some coronaviruses have adapted to humans by becoming a common winter infection (one of many respiratory viruses causing the 'common cold'). The SARS coronavirus disappeared altogether after 2004 partly as a result of control measures in all affected countries. The other severe coronavirus infection, Middle East respiratory syndrome (MERS), is still causing occasional outbreaks in humans since it appeared in 2012, but has not become a pandemic.

Based on current knowledge, and the potential for harm, we need to respond vigorously and effectively to minimise the impact of this epidemic on the population of New Zealand and neighbouring Pacific countries. This response should include following the example of many countries outside of China which have enhanced risk-based entry screening at airports (eg, asking travellers about their travel history and any symptoms and providing them with information). If this new coronavirus does become established in New Zealand we should work with Pacific nations to consider exit screening or even suspending air flights from New Zealand to give them more time to prepare for this epidemic.

Throughout this response, we should also take the opportunity to refine our pandemic response systems, identify improvements to our public health infrastructure, and enhance scientific knowledge. The global environment is arguably becoming more dangerous, with climate change, ecological collapse, and the increased availability of synthetic biology potentially increasing the risk of pandemic diseases. All the more need to strengthen our public health institutions at the regional, national and international levels.

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