

- Variation (Biology) / Virus**Will Covid-19 become less dangerous as it evolves?**

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The pandemic has been awash with slogans, but in recent weeks, two have been repeated with increasing frequency: “Variants will evolve to be milder” and “Covid will become endemic”. Yet experts warn that neither of these things can be taken for granted.

Those stating that viruses become less deadly over time often cite influenza. Both of the flu viruses responsible for the 1918 Spanish flu and 2009 swine flu pandemics eventually evolved to become less dangerous. However, the 1918 virus is thought to have become more deadly before it became milder. And other viruses, such as Ebola, have become more dangerous over time.

“It’s a fallacy that viruses or pathogens become milder. If a virus can continue to be transmitted and cause lots of disease, it will,” said Prof David Robertson, head of viral genomics and bioinformatics at the University of Glasgow’s Centre for Virus Research.

Viruses aim to create as many copies of themselves and spread as widely as possible. Although it is not always in their best interests to kill their hosts, so long as they are transmitted before this happens, it doesn’t matter. Sars-CoV-2 doesn’t kill people during the period when it is most infectious; people tend to die two to three weeks after becoming ill. Provided it does not evolve to make people so ill that they do not, or cannot, mix with other people while they are infectious, the virus doesn’t care if there are some casualties along the way.

Neither is it clear that Sars-CoV-2 is becoming progressively milder. Omicron appears to be less severe than the Alpha or Delta variants – but both of these variants caused more severe illness than the original Wuhan strain. Importantly, viral evolution is not a one-way street: Omicron did not evolve from Delta, and Delta didn’t evolve from Alpha – it is more random and unpredictable than that.

“These [variants of concern] are not going one from the other, and so if that pattern continues, and another variant pops out in six months, it could be worse,” said Robertson. “It’s important not to assume that there’s some inevitability for Omicron to be the end of Sars-CoV-2’s evolution.”

There is a possibility that Omicron is so transmissible that it has hit a ceiling whereby future variants will struggle to outcompete it. But just a few months ago, people were saying the same thing about Delta. Also, Omicron is likely to keep evolving. “What might play out is that as Omicron infects so many people, it’s harder for that first Omicron [variant] to continue to be as successful, and so that creates a space for a virus that’s better at evading the immune response,” Robertson said.

What about the idea that SarsCoV-2 could become endemic? Politicians tend to use this as a proxy for getting on with our lives and forgetting that Covid-19 exists. What endemic actually means is a disease that’s consistently present, but where rates of infection are predictable and not spiralling out of control

“Smallpox was endemic, polio is endemic, Lassa fever is endemic, and malaria is endemic,” said Stephen Griffin, associate professor of virology at the University of Leeds. “Measles and mumps are endemic, but dependent on vaccination. Endemic does not mean that something loses its teeth at all.”

As more and more people develop immunity to Sars-CoV-2, or recover from infection, the virus may become less likely to trigger severe disease. But it could then evolve again. The good news is that this becomes less likely the

more of the world's population is vaccinated – because the fewer people who are infected, the fewer chances the virus has to evolve – but we're not close to that yet. Even in the UK, there are large numbers of unvaccinated individuals, and it's unclear how long the protection from boosters will last.

“The idea that we will achieve endemicity anytime soon also seems a little bit counter to the fact that we've just had several weeks of massively explosive exponential growth, and prior to that, we were still seeing exponential growth of Delta,” Griffin said.

Transforming Covid into a disease that we can truly live with requires more than a national vaccination campaign and wishful thinking; it requires a global effort to improve surveillance for new variants, and supporting countries to tackle outbreaks at source when they emerge. It also requires greater investment in air purification and ventilation to reduce transmission within our own borders, if we're mixing indoors.

Everyone hopes that the coronavirus will evolve to become milder, and that Covid becomes endemic – or rather, manageable enough not to blight our daily lives. But these are hopes, not facts, and repeating these mantras won't make them happen any faster.