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**Another flavour of omicron**

The BA.2 variant of the coronavirus is spreading fast, but it shouldn’t cause another worldwide wave, says Michael Le Page

ANOTHER year, another variant. Even before the omicron wave is over, the rising number of cases caused by a form of the coronavirus known as BA.2 is causing concern.

**What is BA.2?**

It is basically another flavour of omicron that has arisen right from the start. The term omicron is used to describe a whole family of variants that appeared suddenly in November 2021. Most omicron cases have been caused by one of these variants known to scientists as BA.1. Although BA.2 has 32 of the same mutations as BA.1, it also has 28 that are different. The first BA.2 sample was collected in South Africa on 17 November 2021.

**Why are we hearing about it now?**

In several countries, including the UK, Germany, India and Denmark, the proportion of cases caused by BA.2 is increasing rapidly. In other words, BA.2 is replacing BA.1, which suggests that it is even more transmissible.

**Should I be worried about BA.2?**

If you are unvaccinated and haven’t been infected by omicron, then yes. If you get infected, even if you don’t become severely ill, you could start a chain of infections that does result in deaths.

**Can I get infected with BA.2 if I have had omicron already?**

We don’t yet know, but many researchers think that if people have recently been infected by BA.1, they are unlikely to get BA.2, especially if they have also been vaccinated. That isn’t to say this won’t happen, but the numbers are expected to be low.

A volunteer hands out covid-19 tests in London in January

‘Antibodies elicited by BA.1 will still probably react reasonably well against BA.2, certainly much better than delta antibodies,’ says Jesse Bloom at the Fred Hutchinson Cancer Research Center in Seattle.

**What if I have been vaccinated but haven’t had omicron?**

The existing vaccines are actually even better at protecting against BA.2 than BA.1. According to the UK Health Security Agency, three vaccine doses are 70 per cent effective at preventing symptomatic infections by BA.2 two weeks after the booster, and 63 per cent effective against BA.1. For people with two vaccine doses, the efficacy after 25 weeks is 13 per cent against BA.2 and 9 per cent against BA.1. These are the combined numbers for all vaccines used in the UK.

**Will BA.2 cause yet another wave of cases around the world?**

Hopefully not, though it might prolong the current omicron waves in many countries. In South Africa, whose omicron wave is pretty much over already, there is no sign of a resurgence despite a high proportion of cases now being BA.2. However, nations that have largely succeeded in preventing the spread of covid-19 so far, such as Japan, might find it even harder to suppress BA.2 than BA.1.

**Does all this mean that BA.2 is less dangerous than BA.1?**

Probably. The threat a virus poses depends on its inherent severity, how many people it infects and how much immune protection people have. As far as we know, BA.2 is no more likely to cause severe illness than BA.1, yet it may be 50 per cent more transmissible. More transmissible viruses can cause more hospitalisations and deaths by infecting more people, even if they are no more severe. But in many countries, a large proportion of people now have good immunity due to boosters and infections, which should greatly reduce both the number and severity of BA.2 infections.

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**Game theory shows how people crowd on rush hour trains**

Alex Wilkins

A MODEL informed by game theory shows how the areas around train doors become crowded at rush hour. It could eventually be used as a tool for designing safer public venues.

When two parties interact, such as countries vying for resources, the situation can be modelled using game theory, which assumes both parties make rational decisions.

Thibault Bonnemain at Northumbria University in Newcastle upon Tyne, UK, and his colleagues used a combination of game theory and the physics of complex systems to work out how crowds might move, based on modelling how an individual reacts to the crowd surrounding them.

They focused on modelling the crowd member’s immediate environment, taking into account the other individuals that were within touching distance. But the model also assumed that the crowd member would look beyond this local area and adjust their behaviour in response to potential obstacles.

“A key aspect of this work is anticipation,” says Bonnemain.

**“The virtual members of the crowd mimicked real-world behaviour at railway stations”**

When Bonnemain and his team ran simulations based on equations they developed, they noticed the virtual members of their crowds mimicked real-world behaviour. For instance, in a virtual railway station, crowds formed around train doors, with the density of people highest as the doors closed (arxiv.org/abs/2201.08592).

The model is still in development, but Bonnemain says it could eventually have real-world applications – for instance, in designing venues that crowds can enter and exit quickly and easily.