

Covid reinfections are possible. Should we worry?

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The patient walked into the Washoe County community testing station in the US state of Nevada on April 18 with a sore throat, dry cough and a headache, but no reason to worry.

He was only 25, had no prior medical conditions, and although the PCR nasal-swab test for COVID-19 he took came back positive, he was soon feeling well again.

Thirty five days later, he was rushed to the emergency room, short of breath and with a raging fever, and placed on oxygen support.

He had become the first confirmed US case of COVID-19 [reinfection](#).

Up to now, there have been only a handful of similar cases worldwide, and experts say it is too early to draw sweeping conclusions from such a small head count.

But the prospect of getting reinfected with COVID-19—and getting even sicker the second time around—could have a significant impact on how governments chart the path out of the pandemic.

In particular, reinfections may render the idea of herd immunity—that is, a sufficiently high percentage of people eventually becoming immune to COVID-19—unrealistic.

"Reinfection cases mean that in some people, the immune response is not enough to protect them from infection or disease," Akiko Iwasaki, a professor of Immunobiology and Molecular, Cellular and Developmental Biology at Yale University, told AFP.

"Reinfections from SARS-CoV-2 (the [virus](#) that causes COVID-19) mean that immunity acquired through natural infection is not perfect."

Researchers who documented the Nevada patient's case offered a number of possible explanations as to how he could have gotten sick twice.

He may have been exposed to a very high dose of the virus the second time around, triggering a more acute reaction.

Alternatively, it may have been a more virulent strain of the virus.

The study, published this week in *The Lancet Infectious Diseases*, listed other confirmed reinfections in Belgium, the Netherlands, Hong Kong and Ecuador.

Too soon to tell?

Frederic Altare, director of Immunology at the Inserm Research Centre of Oncology and Immunology Nantes-Angers, said there was currently little evidence that COVID-19 reinfection was going to be a "major issue" given the low case figures.

"With the number of people who have been infected there are only a dozen or so proven reinfections—that's not much," he told AFP.

But others said it was difficult to accurately gauge reinfection numbers given the relative lack of testing during the first wave this spring.

In other words, many people could have in theory been infected in March or April and remained asymptomatic, only to test positive later in the year when they were reinfected, but this time with symptoms.

According to Jeffrey Shaman, professor of Environmental Health Sciences at the Columbia University Mailman School of Public Health, the main obstacle to ascertaining reinfection numbers is that SARS-CoV-2—unlike other coronaviruses that circulate among humans—is brand new, epidemiologically speaking.

"The world has only been dealing with this for a number of months," he

told AFP.

"We don't know if (reinfection) is going to be common or as likely to be equally severe as the [initial infection](#).

"It's really important to understand what this virus is ultimately going to do and how challenging it's going to be to make a [universal vaccine](#)," Shaman said.

Other viruses

While it is hard to say for certain how widespread or frequent COVID-19 reinfections will end up being, scientists can look to similar viruses for clues.

Lia van der Hoek, an expert on coronaviruses at Amsterdam UMC, has studied the pathogens for decades.

She was the lead author on a paper published last month in Nature Medicine investigating the four other coronaviruses that humans can catch.

The study charted 10 healthy individuals over the course of more than 30 years, and found that patients were infected multiple times with the virus.

One patient was infected on 17 separate occasions over the study period.

"COVID-19 will probably behave the same," she told AFP.

Shaman also studied the circulation of other coronaviruses, following 12 healthy individuals and proving they could be reinfected a second time.

He said that evidence from other respiratory viruses suggested widespread reinfections of COVID-19 was by no means impossible.

Herd immunity 'dangerous'

On Monday researchers in the Netherlands released the case study of a 89-year-woman who died after contracting COVID-19 twice.

She had been treated for cancer, and her immune system was damaged as a result, making her more susceptible to severe infection.

As the world searches for a vaccine, Iwasaki said that any eventually safe and universal inoculation would need to generate higher levels and longer lasting immunity in people than through natural infection.

"Fortunately, some vaccine candidates appear to do exactly that."

But reinfections likely meant that any hope of naturally occurring herd immunity "would not be possible", Iwasaki said.

"Based on what we know about COVID-19, it would be too dangerous to try to achieve herd immunity through natural exposure to this virus, as it can be lethal or detrimental in people of all ages."

There is also the grim prospect of so-called antibody dependent enhancement—when antibodies actually make subsequent infections worse, such as with dengue fever.

While there is currently no proof that occurs with COVID-19, Shaman said he knows of no-one who can rule that out.

COVID-19 'never going away'

While many governments are basing their hopes of a full economic recovery on a vaccine, Van der Hoek said there may never be a single, entirely effective COVID-19 failsafe.

"The problem with coronavirus antibodies is that they wane so quickly and you can get reinfected with the same strain," she said.

"So it could be that you need repeated (COVID-19) vaccinations all the time.

"This one will never go away. There is no way we can get rid of it. It will stay with us for the rest of humanity."

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