

# Covid-19 reinfection casts doubt on virus immunity: study

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COVID-19 patients may experience more severe symptoms the second time they are infected, according to research released Tuesday confirming it is possible to catch the potentially deadly disease more than once.

A study published in *The Lancet Infectious Diseases* journal charts the first confirmed case of COVID-19 [reinfection](#) in the United States—the

country worst hit by the pandemic—and indicates that exposure to the virus may not guarantee future immunity.

The patient, a 25-year-old Nevada man, was infected with two distinct variants of SARS-CoV-2, the virus that causes COVID-19, within a 48-day time frame.

The second infection was more severe than the first, resulting in the patient being hospitalised with oxygen support.

The paper noted four other cases of reinfection confirmed globally, with one patient each in Belgium, the Netherlands, Hong Kong and Ecuador.

Experts said the prospect of reinfection could have a profound impact on how the world battles through the pandemic.

In particular, it could influence the hunt for a vaccine—the currently Holy Grail of pharmaceutical research.

"The possibility of reinfections could have significant implications for our understanding of COVID-19 immunity, especially in the absence of an effective vaccine," said Mark Pandori, for the Nevada State Public Health Laboratory and lead study author.

"We need more research to understand how long immunity may last for people exposed to SARS-CoV-2 and why some of these second infections, while rare, are presenting as more severe."

## **Waning immunity?**

Vaccines work by triggering the body's natural immune response to a certain pathogen, arming it with antibodies it to fight off future waves of infection.

But it is not at all clear how long COVID-19 antibodies last.

For some diseases, such as measles, infection confers lifelong immunity. For other pathogens, immunity may be fleeting at best.

The authors said the US patient could 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.

Another hypothesis is a mechanism known as antibody dependent enhancement—that is, when antibodies actually make subsequent infections worse, such as with [dengue fever](#).

The researchers pointed out that reinfection of any kind remains rare, with only a handful of confirmed cases out of tens of millions of COVID-19 infections globally.

However, since many cases are asymptomatic and therefore unlikely to have tested positive initially, it may be impossible to know if a given COVID-19 case is the first or second [infection](#).

In a linked comment to The Lancet paper, Akiko Iwasaka, a professor of Immunobiology and Molecular, Cellular and Developmental Biology at Yale University, said the findings could impact public health measures.

"As more cases of reinfection surface, the scientific community will have the opportunity to understand better the correlates of protection and how frequently natural infections with SARS-CoV-2 induce that level of immunity," she said.

"This information is key to understanding which vaccines are capable of

crossing that threshold to confer individual and herd immunity," added Iwasaka, who was not involved in the study.

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