

Study finds high number of persistent COVID-19 infections in the general population

February 21 2024



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A new study led by the University of Oxford has found that a high proportion of SARS-CoV-2 infections in the general population lead to persistent infections lasting a month or more. The findings have been [published](#) in the journal *Nature*.

It has long been thought that prolonged COVID-19 infections in [immunocompromised individuals](#) may have been the source of the multiple new variants that arose during the coronavirus pandemic and seeded successive waves of infection, including the alpha and omicron variants. But until now, the prevalence of persistent COVID-19 infections in the general population and how the virus evolves in these situations remained unknown.

To investigate this, the researchers used data from the Office for National Statistics COVID Infection Survey (ONS-CIS), which tested participants approximately monthly.

Of the 90,000+ participants, 3,603 provided two or more positive samples between November 2020 to August 2022 where the virus was sequenced. Of these, 381 individuals tested positive with the same viral infection over a period of a month or longer.

Within this group, 54 individuals had a persistent infection that lasted at least two months. The researchers estimate that between one in a thousand to one in 200 (0.1–0.5%) of all infections may become persistent, and last for at least 60 days.

In some cases, individuals remained infected with viral variants that had gone extinct in the general population. In contrast, the researchers found that reinfection with the same variant was very rare, likely due to the host developing immunity to that variant and the [variant](#) reducing in frequency to very low levels after a few months.

Of the 381 [persistent infections](#), 65 had three or more PCR tests taken over the course of their infection. Most (82%) of these individuals demonstrated rebounding viral dynamics, experiencing high, then low, then high viral load dynamics. According to the researchers, this demonstrates that the virus can maintain the ability to actively replicate

during prolonged infections.

In the study, people with persistent infections were 55% more likely to report having long-COVID symptoms more than 12 weeks since the start of the infection than people with more typical infections.

Certain individuals showed an extremely high number of mutations, including mutations that define new coronavirus variants, alter target sites for [monoclonal antibodies](#), and introduce changes to the coronavirus spike protein. However, most individuals did not harbor a large number of mutations, suggesting that not every persistent infection will be a potential source for new concerning variants.

Co-lead author of the study Dr. Mahan Ghafari (Pandemic Sciences Institute, Nuffield Department of Medicine, University of Oxford) said, "Our observations highlight the continuing importance of community based genomic surveillance both to monitor the emergence and spread of new variants, but also to gain a fundamental understanding of the natural history and evolution of novel pathogens and their clinical implications for patients."

Co-lead author Dr. Katrina Lythgoe (Department of Biology and Pandemic Sciences Institute, University of Oxford) said, "Although the link between viral persistence and long COVID may not be causal, these results suggest persistent infections could be contributing to the pathophysiology of long COVID. Indeed, many other possible mechanisms have been suggested to contribute to long COVID including inflammation, organ damage, and micro thrombosis."

More information: Mahan Ghafari, Prevalence of persistent SARS-CoV-2 in a large community surveillance study, *Nature* (2024). [DOI: 10.1038/s41586-024-07029-4](https://doi.org/10.1038/s41586-024-07029-4).
www.nature.com/articles/s41586-024-07029-4

Provided by University of Oxford

Citation: Study finds high number of persistent COVID-19 infections in the general population (2024, February 21) retrieved 16 June 2024 from <https://medicalxpress.com/news/2024-02-high-persistent-covid-infections-general.html>

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