

Research helps to identify immunosuppressed people least likely to have COVID-19 antibodies

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New research involving the University of Southampton has identified which people with compromised immune systems are less likely to have

COVID-19 antibodies—making them more vulnerable to a severe infection.

Around one in five people with solid organ transplant, rare autoimmune disease or blood cancer affecting lymphocytes had no COVID-19 antibodies after three or more vaccinations.

The MELODY study was carried out by a team of doctors and researchers from several institutions including Imperial College London, The Universities of Southampton, Nottingham, and Cambridge, Nottingham University Hospitals NHS Trust, NHS Blood and Transplant, the National Disease Registration Service at NHS England, and IPSOS MORI.

People were more likely to have antibodies if they were younger, had more [vaccine doses](#) (e.g. five vs. three) or had previously had COVID-19. Some medications that weaken the immune system reduced the likelihood of having antibodies.

The findings published in *The Lancet Rheumatology* will help to better plan care and treatment for people living with these conditions. People who are less likely to have COVID-19 antibodies could be offered antibody testing and targeted interventions, such as further vaccine doses or preventative medicine. The absence of antibodies could also influence which immunotherapy medications are given to those with different underlying conditions.

Dr. Michelle Willicombe, from the Department of Immunology & Inflammation at Imperial College London, who led the research, said, "We know from previous research that people who have a [weakened immune system](#) were more likely to catch COVID-19. They were also more likely to need to go into hospital for treatment or die from COVID-19.

"Vaccines trigger the immune system to make antibodies. But if your [immune system](#) is weak, you may not produce enough antibodies needed to fight infection and prevent serious illness. Clinically [vulnerable patients](#) who are at increased risk are encouraged to attend if they are invited for a booster vaccine, in order to get the best protection against COVID-19."

People with suppressed immune systems could choose to enroll in the study if they had received at least three COVID-19 vaccine doses. More than 23 thousand people took part by doing a home finger-prick antibody test and reporting the results using an online portal.

Participants also provided [personal details](#) (such as their age, gender and ethnicity), information about their condition, and their COVID-19 history, including number of vaccinations.

Antibodies were found in 77% of people who had a solid organ transplant, 79% of those with a [blood cancer](#), and 86% with rare autoimmune disease.

"We now know that the majority of immunosuppressed people produce antibodies after having a COVID-19 [vaccine](#)," says co-author of the study Professor Sean Lim from the University of Southampton. "In the future, we could offer home antibody tests to those who we know are least likely to have antibodies and provide them to have quick access to preventative treatments if this is the case. The findings could also help to develop bespoke booster vaccination schedules for different groups."

Dr. Peter Lanyon, Consultant Rheumatologist, Nottingham University Hospitals NHS Trust and Rare Diseases Clinical Lead, National Disease Registration Service, NHS England said, "This study demonstrates the utility of national rare disease registration to identify and invite whole population-based cohorts of people to participate in research that

answers important clinical questions and can inform clinical practice and health policy."

More information: Fiona A Pearce et al, Antibody prevalence after three or more COVID-19 vaccine doses in individuals who are immunosuppressed in the UK: a cross-sectional study from MELODY, *The Lancet Rheumatology* (2023). [DOI: 10.1016/S2665-9913\(23\)00160-1](https://doi.org/10.1016/S2665-9913(23)00160-1)

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