

A single dose of vaccine boosts protection against SARS-CoV-2 coronavirus variants, but only in those with previous COVID-19, a study has found.

In those who have not previously been infected and have so far only received one dose of vaccine the immune response to variants of concern may be insufficient. [The findings](#), published today in the journal *Science* and led by researchers at Imperial College London, Queen Mary University of London and University College London, looked at immune responses in UK healthcare workers at Barts and Royal Free hospitals following their first dose of the Pfizer/BioNTech vaccine. They found that people who had previously had mild or asymptomatic infection had significantly enhanced protection against the Kent and South Africa variants, after a single dose of the mRNA vaccine. In those without prior COVID-19, the immune response was less strong after a first dose, potentially leaving them at risk from variants.

[Professor Rosemary Boyton](#), Professor of Immunology and Respiratory Medicine at Imperial College London, who led the research, said: “Our findings show that people who have had their first dose of vaccine, and who have not previously been infected with SARS-CoV-2, are not fully protected against the circulating variants of concern. This study highlights the importance of getting second doses of the vaccine rolled out to protect the population.” Blood samples were analysed for the presence and levels of immunity against the original strain of SARS-CoV-2, as well as the Kent (B.1.1.7) and South Africa (B.1.351) variants of concern. Along with antibodies – the Y-shaped proteins which stick to the virus and help block or neutralize the threat – the researchers also focused on two types of white blood cell: B-cells, which ‘remember’ the virus; and T cells, which help B cell memory and recognise and destroy cells infected with coronavirus.

People who have had their first dose of vaccine, and who have not previously been infected with SARS-CoV-2, are not fully protected against the circulating variants of concern. They found that after a first dose of vaccine, prior infection was associated with a boosted T cell, B cell and neutralizing antibody response, which could provide effective protection against SARS-CoV-2, as well as the Kent and South Africa variants. However, in people without previous SARS-CoV-2 infection, a single vaccine dose resulted in lower levels of neutralizing antibodies against SARS-CoV-2 and the variants, potentially leaving them vulnerable to infection and highlighting the importance of the second vaccine dose.

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