

PRESS RELEASE

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THE VAST MAJORITY OF THE POPULATION OF GENEVA HAS BEEN INFECTED BY THE SARS-COV-2 VIRUS BUT ONLY HALF HAVE ANTIBODIES THAT NEUTRALIZE THEOMICRON VARIANTS

A study by the Geneva University Hospitals (HUG), the Faculty of Medicine of the University of Geneva (UNIGE) and the EPFL shows that almost all Genevans (93.8%) have antibodies against SARS-CoV 2, almost three quarters of whom acquired them through an infection. Eight out of ten people have defenses against the Alpha and Delta variants, but less than one in two (46.7%) have them against the BA.4/BA.5 Omicron sub-variants. The latter are particularly low among children under 12 years of age. The study will be published shortly on the [MedRxiv website](#).

29 months after the start of the COVID-19 pandemic, almost the entire population¹ (93.8%) has developed antibodies against SARS-CoV-2 following exposure to different variants and/or vaccination. A previous study published by the same research team in June-July 2021 reported antibodies in two-thirds of the population. Half of them (29.9% of the population) had acquired them by infection. The introduction of vaccination in December 2020 and its extension to 12-15 year olds from June 2021 and to 5-11 from January 2022, as well as the Delta (autumn-winter 2021/2022) and Omicron (winter-spring 2022) waves have changed the immune landscape of the population.

Reduced immunity to Omicron

The study shows that the overall seroprevalence of anti-SARS-CoV-2 antibodies is now 93.8%. Among seniors 75 years of age and over, it rises to 96.7% linked to infection and/or vaccination. No difference was found between men and women. Almost three quarters (72.4%) of the population acquired them by infection, which represents an increase of over 42% in one year. In vitro analyses carried out at the EPFL make it possible to test the degree to which these antibodies neutralize the different variants of the virus, in principle limiting the risk of new infections by them. Eight out of ten people (79.5%) have antibodies neutralizing Alpha, while less than half (46.7%) have antibodies neutralizing Omicron sub-variants BA.4 and BA.5

Children potentially less protected against Omicron

More than 90% of children aged 6-11 years and more than 75% of children aged 0-5 years acquired antibodies following infection. However, in children under 12 years of age these antibodies appear to be significantly less neutralizing than in older people, particularly against Omicron sub-variants. *“According to our models, this can be explained in part by a lower vaccination rate among minors than among adults”*, explains Pre Silvia Stringhini, epidemiologist in charge of the population epidemiology unit at HUG and assistant professor at the UNIGE Faculty of Medicine.

¹ The canton of Geneva has about 500,000 inhabitants. It announced nearly 229,000 cases of SARS-CoV-2 as of 19 July 2022 (447/1,000 population). 881 deaths were recorded.

Important effect of the booster

The study shows that vaccination, and in particular the booster dose, contributes strongly to the neutralizing power of antibodies against the Alpha and Delta variants. Indeed, immunity against the latter rises to more than 90% in people who have received boosters, while it falls to 60% in those not infected who have had only two doses of vaccine. For the Omicron sub-variants, a combination of the vaccine booster and a recent infection is the most protective.

Essential for public health programs

Accurate and up-to-date knowledge of the population's immunity and ability to resist the different variants is valuable for making appropriate public health decisions as the different waves occur. With this in mind, a team of researchers² coordinated by HUG and UNIGE estimated the seroprevalence and neutralization capacity of the different variants in Geneva and Switzerland, after Omicron became dominant in Geneva, Switzerland.

Prof. Idris Guessous, Head of the Department of Primary Care Medicine at HUG and Associate Professor at the UNIGE Faculty of Medicine, who is in charge of the study, explains that *“the results of this study suggest that the development of vaccines specifically targeting Omicron variants would be useful to prevent the spread of infections and their health and economic consequences.”*

More than 2,500 Genevans participated

The serological study was carried out between 29 April and 9 June 2022 among 2,521 people of all ages in Geneva. The group consisted of 55.2% women; 21.4% under 18 years of age and 14.2% 65 years or older. The presence of anti-SARS-CoV-2 antibodies was assessed using commercial immunoassays targeting either the spike protein or the nucleocapsid protein. The neutralizing capacity of antibodies against different variants was assessed using a test developed by the research teams of Prof. Didier Trono's group at EPFL and Prof. Giuseppe Pantaleo at CHUV.

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