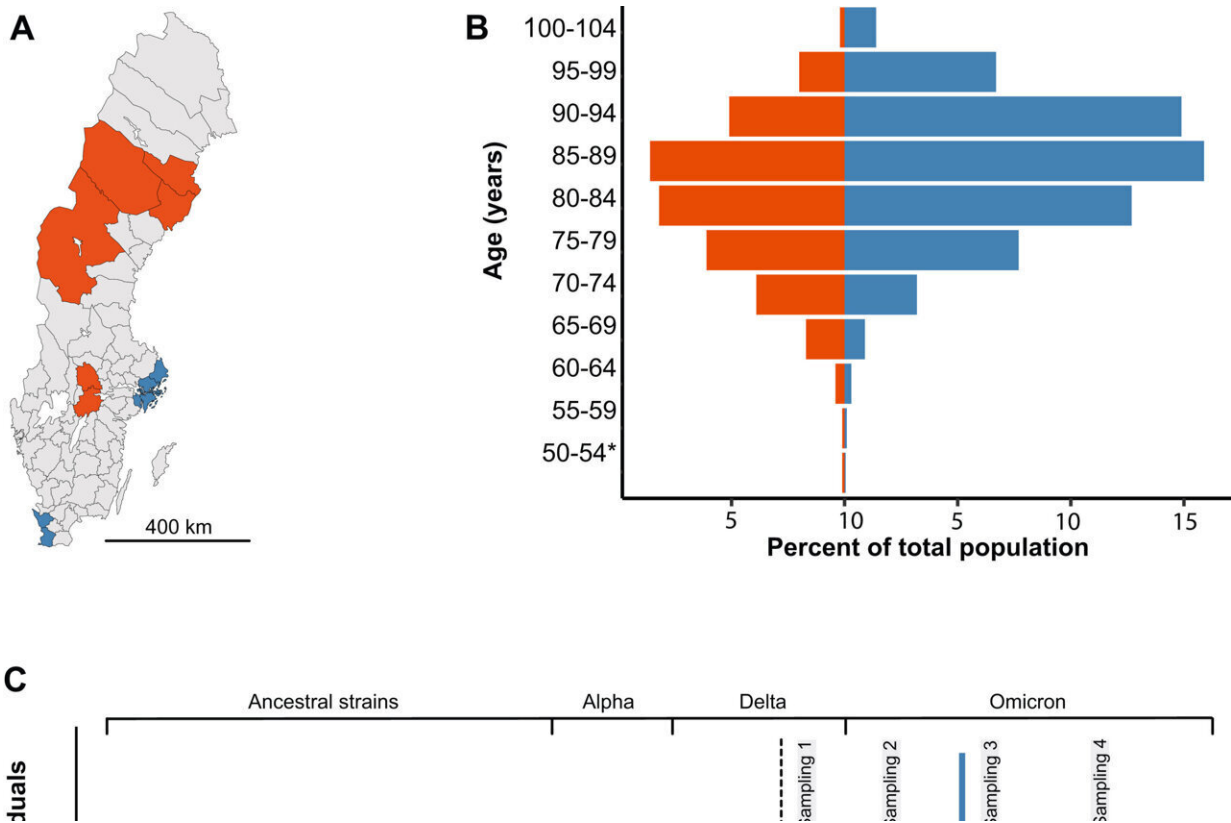


# Elderly with few antibodies may need an extra dose of COVID-19 vaccine: Study

May 11 2023, by Ola Nilsson



Location of nursing homes, age and sex characteristics, and the progression of PCR-verified SARS-CoV-2 infections in the study population of 3012 study subjects. Panel A shows locations in Sweden of nursing homes with recruitment of study subjects in two metropolitan areas (Stockholm and Malmö; blue color) and three less densely populated regions (Västerbotten, Jämtland-Härjedalen, and Örebro; red color). Panel B shows proportions of the total population stratified per age-group of women (blue bars) and men (red bars). An asterisk indicates that one 41-year-old study subject was included. Panel C shows PCR-verified

SARS-CoV-2 incidence among the study subjects over the entire pandemic. Timing of vaccine doses, study start, blood sampling periods, dominating virus variant deduced from national genomic surveillance data, periods of vaccination, and blood sampling are indicated. For vaccination and sampling, a gray-shaded interval represents that 80% of the vital cohort was completed. Credit: *The Lancet Regional Health - Europe* (2023). DOI: 10.1016/j.lanepe.2023.100646

The new mRNA vaccines have just as good a protective effect against COVID-19 for the very oldest as for younger people. This is evident in a study at Umeå University, where researchers have followed individuals in special housing around Sweden. However, the study shows that elderly people with a low antibody response after vaccination were at increased risk of dying from the omicron variants of the disease. The research is published in *The Lancet Regional Health—Europe*.

"The result suggests that we should be able to identify in advance which people have the greatest risk of being seriously affected and may need extra efforts in the form of, for example, additional [vaccine](#) doses," says Linnea Vikström, Ph.D. student at the Department of Clinical Microbiology at Umeå University and joint first author of the study.

Starting in September 2021, the researchers followed 114 different special housing units with a total of just over 3,000 people in Skåne, Stockholm, Örebro, Jämtland-Härjedalen and Västerbotten Counties. Finger prick blood samples were taken every three months from the residents and compared with data on illness and death. The average age in special housing for the elderly is 86 years.

## **96-fold increase**

By October 2021, almost all residents had received the third dose of the

COVID vaccine. The researchers could then see a 96-fold increase in the amount of antibodies in the blood. The fourth dose in March 2022 only gave a fourfold increase in the antibodies, which can be explained by the fact that the level was already high then. The researchers were also able to establish that the amount of antibodies was largely the same for people over and under 65 years of age. This suggests that the mRNA vaccines given in doses three and four worked just as well for the elderly as for the younger.

The researchers continued with studies on a smaller group of how vaccination protects against the different omicron variants of COVID-19. With supplementary blood samples, the ability of the antibodies to neutralize the virus variants was analyzed. It was then possible to see that the antibodies did not protect against contracting the disease in themselves. In contrast, the antibodies greatly reduced the risk of dying from the disease.

## Higher mortality

People with lower levels of antibodies had increased mortality within 30 days of infection. When the researchers performed [statistical analyses](#) on test results of all the elderly who participated in the study, they saw that the people with the ten percent lowest levels of antibodies in their blood were three to four times as likely to die within 30 days of being diagnosed with the virus.

The lower level of antibodies in some [elderly people](#) is probably related to the fact that there may be [individual differences](#) in how different people's immune systems react to vaccines.

"The study can help us and other researchers understand how the different variants of the virus get past the [immune system](#) among the elderly and how the vaccine needs to be developed to protect against

serious illness and death," says Linnea Vikström.

**More information:** Linnea Vikström et al, Vaccine-induced correlate of protection against fatal COVID-19 in older and frail adults during waves of neutralization-resistant variants of concern: an observational study, *The Lancet Regional Health—Europe* (2023). [DOI: 10.1016/j.lanepe.2023.100646](https://doi.org/10.1016/j.lanepe.2023.100646)

Provided by Umea University

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