

# Residential context important factor in risk of COVID-19 mortality among older adults, Stockholm study suggests

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Older people living with or in close contact with people of working age may be at higher risk of COVID-19 mortality in Stockholm, Sweden,

according to an observational study published today in *The Lancet Healthy Longevity* journal.

The researchers highlight that the study focuses on Sweden, where only the frailest older people tend to live in [care homes](#) and where lockdown was never formally implemented but which relied on people adhering to social distancing recommendations, and therefore the findings may not apply other countries. However, experts commenting on the study warn that it provides a clear example of the impact on elderly people when community transmission is not part of a control strategy.

Maria Brandén, of Linköping University, Sweden, and lead author of the study, said: "Our findings confirm that in areas of the community where there are high numbers of COVID-19 infections, there are [high mortality rates](#) among the elderly and that [elderly people](#) are more at risk of dying from COVID-19 if they live in a care home or with [family members](#) who are working age."

She adds: "Controlling community transmission is key in protecting everyone in this pandemic. Neighbourhood transmission is an important consideration for COVID-19 even if older people can and do self-isolate, because many of them will come into contact with working age people at some point. Close exposure to working age-individuals in the form of care workers or other [household members](#) puts older people at risk, so strategies to protect these people must be explored, with particular attention to densely populated areas."

Living arrangements, the type of home, and neighbourhood characteristics are considered to be important aspects in understanding the spread of COVID-19 among older adults, but previous research has relied on aggregated data and not considered individual risk factors. In this first of its kind study, individual patient data was used to evaluate how residential context was related to COVID-19 mortality among older

adults in Stockholm, Sweden.

In the [observational study](#), researchers used data from the cause-of-death register held by the Swedish National Board of Health and Welfare to identify COVID-19 mortality, and mortality from other causes among people aged 70 years and over in Stockholm between 12 March and 8 May 2020.

During the study period, there were 3,386 deaths, 1,301 were reported as COVID-19 related. They linked five variables to find out how many COVID-19 deaths were associated with each. The variables included how crowded the housing was ( $m^2$  per individual), the household age structure (living alone, living with at least one individual aged 66 years or over, and living with at least one individual younger than 66 years), house type (single-family detached house, multi-family housing such as apartment buildings and care homes), neighbourhood population density, and confirmed cases in the area.

The researchers then adjusted these numbers for other factors that could influence COVID-19 mortality (age, sex, education, income, and country of birth) and created a model to calculate the difference in risk of dying from COVID-19 associated with the five variables. They also compared these figures to mortality from other causes of death to see which factors were exclusively associated with COVID-19. This comparison allowed the researchers to highlight which residential conditions were particularly relevant risk factors for COVID-19, rather than being general risk factors for the elderly.

When looking at living arrangements, those in care homes had the highest mortality (233 deaths per 1,000 people per year), followed by those living in apartment blocks (26 deaths per 1,000 people per year), and those living in a detached house (16 deaths per 1,000 people per year). After adjusting for age, sex, education, income, and country of

birth, individuals living in care homes were four times as likely to die of COVID-19 compared to those living in independent housing.

In terms of household age structure, the lowest COVID-19 mortality was found among older people who lived with someone aged 66 or older (19 deaths per 1,000 people per year), while the highest mortality was found in homes with at least one person older the 66 years of age and one child younger than 16 years of age (38 deaths per 1,000 people per year in homes). After adjustment, living with someone who is working age (younger than 66 years old) was associated with a 60% increase in COVID-19 mortality, compared with living in a household with individuals aged 66 years or older.

Living in the most densely populated neighborhoods (more than 5,000 individuals per km<sup>2</sup>) had the highest mortality (39 deaths per 1,000 people per year), compared to neighbourhoods of less than 150 individuals per km<sup>2</sup> (11 deaths per 1,000 people per year). After adjustment, older people living in the most densely populated neighborhoods (more than 5,000 individuals per km<sup>2</sup>) were at a 70% higher risk of dying from COVID-19 than the least populated areas.

All factors were exclusively associated with COVID-19 except when it came to living in the most crowded homes, which was also associated with an increase of mortality of other causes of [death](#). Living in the most crowded homes (0 m<sup>2</sup> to

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