

# High BMI in upper teens a risk factor for severe COVID-19

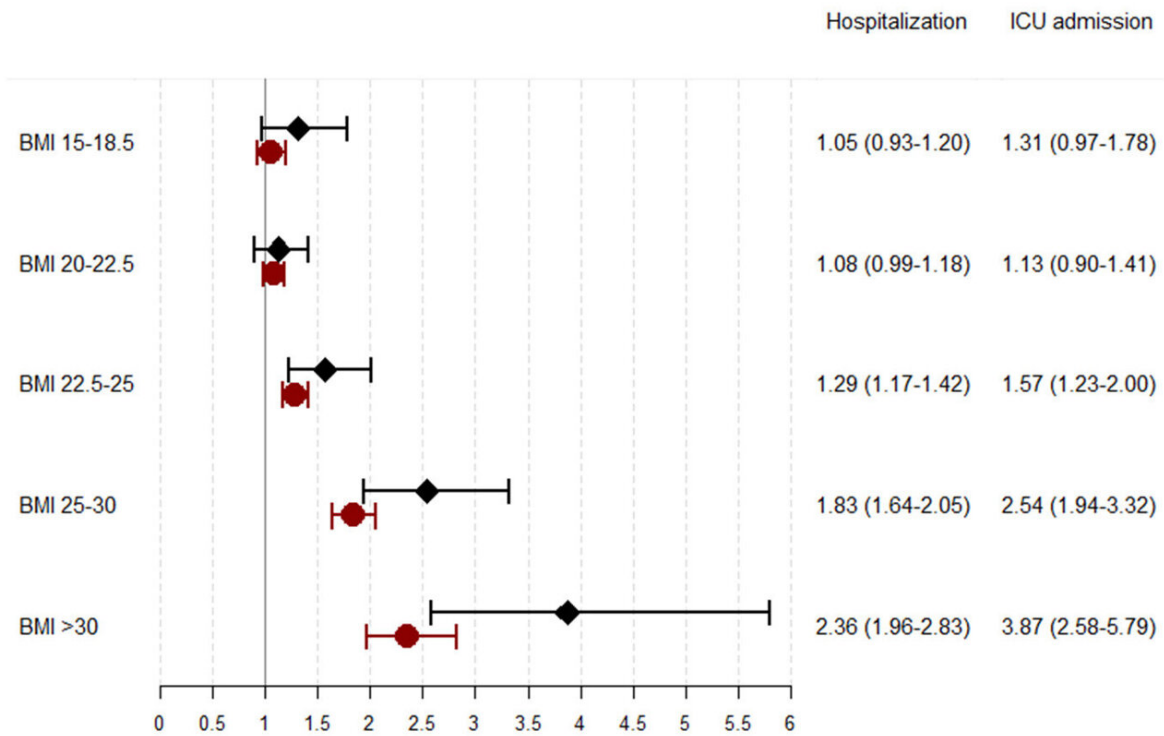
February 22 2022

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**A**

**Odds ratio, adjusted for age and center**

● Hospitalization ◆ ICU admission



**B**

**Odds ratio, adjusted for age, center, diabetes, hypertension, heart failure, coronary heart disease**

● Hospitalization ◆ ICU admission

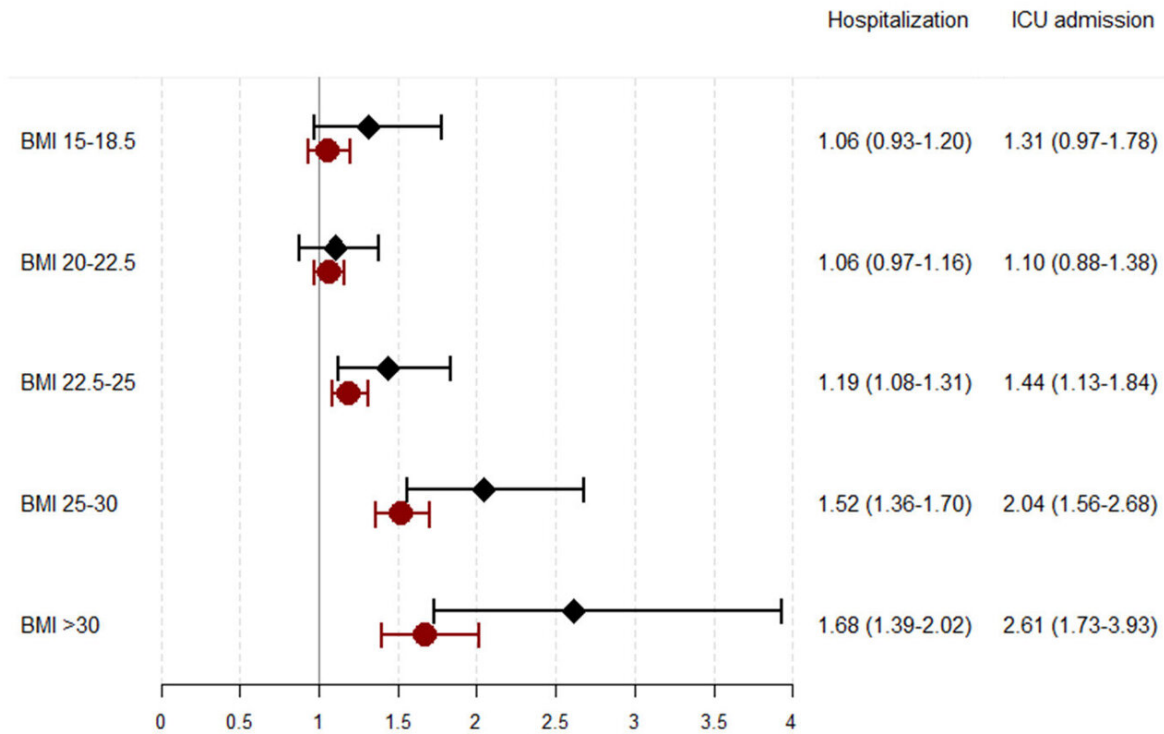


Figure 1. Odds ratios and 95% CIs for COVID-19 hospitalization and intensive care unit admission divided by BMI groups. (A) Adjusted for age in 2020 and test center. (B) Further adjusted for preexisting comorbidities (before January 1, 2020), including diabetes mellitus type 1 and 2, hypertension, heart failure, and coronary heart disease. Credit: DOI: 10.1002/oby.23378

Men with a high body mass index (BMI) in their upper teens had an elevated risk of severe COVID-19, requiring hospitalization, later in life, University of Gothenburg researchers show in a register study.

For some time, overweight and obesity have been recognized [risk factors](#) for severe COVID-19. To date, however, there have been no studies to monitor large groups of individuals whose obesity was identified at an early age, and to find out how severely ill they become if they later get COVID-19.

The present study, published in the journal *Obesity*, includes data from the Swedish Military Service Conscription Register on 1,551,670 men in Sweden, born between 1950 and 1987, who were conscripted for military service in the period 1969–2005. At the outset, their height and weight were measured.

Merging the conscription data with three Swedish medical registers—the National Patient Register, the Intensive Care Register and the Cause of Death Register—revealed a clear connection between BMI in adolescence and the risk of getting COVID-19, many years later, severely enough to require hospitalization. Even clearer was the link between BMI in the upper teens and needing [intensive care](#) for the disease.

## Elevated risk from normal weight upward

For the study, the scientists divided the men into six groups, from underweight (BMI 15–18.5) to three levels of normal weight (18.5–20, 20–22.5 and 22.5–25), followed by overweight (25–30) and obesity (BMI of 30 or more). Of the whole group during the study year (2020), 4,315 men with COVID-19 required hospitalization; 729 of them received intensive care; and 224 died from COVID-19.

Even for men who had been in the 22.5–25 BMI range in adolescence—that is, within the [normal weight](#) range—an elevated risk of needing hospital care for COVID-19 was found. The need increased successively with rising BMI results from the time of conscription 15 to 50 years earlier.

"At population level, we can see that being overweight in the late teens raises the risk of hospitalization and intensive care for COVID-19. For those with teenage obesity, the risk of admission to an intensive care unit is more than twice as high as for those with a BMI of 18.5–20," says Josefina Robertson. A researcher at Sahlgrenska Academy, University of Gothenburg, a doctor specializing in infectious diseases at the Sahlgrenska University Hospital and the first author of the study.

Her colleague Maria Åberg is an associate professor at the School of Public Health and Community Medicine at Sahlgrenska Academy; a physician specialized in general medicine in the regional health, part of Region Västra Götaland, and the last author of the study.

"Several studies have identified overweight as a risk factor for becoming severely ill with COVID-19, and we're now showing that overweight and obesity even in early life plays a part," Åberg says.

## Important ahead of future patients

The fact that obesity can be linked to an elevated risk of becoming severely ill from various [infectious diseases](#), such as influenza, is well known. Obesity has an adverse impact on the immune system and worsens a person's propensity for inflammation, which can contribute to more serious infections.

In the present study, the early BMI values were found to accompany the men up to middle age. This is evident from the data from health tests known as health-profile assessments, devised by the Health Profile Institute (HPI), for 151,693 of the participants.

Josefina Robertson says, "It's interesting to see that the men's BMI in adolescence is a risk factor for severe COVID-19 many years later. A high BMI in the men's teens also persisted into middle age, which is a trend that other studies have shown as well. That's why it's important to take preventive measures against [obesity](#) even at a young age, especially ahead of future viral pandemics," she concludes.

**More information:** Josefina Robertson et al, BMI in early adulthood is associated with severe COVID-19 later in life: A prospective cohort study of 1.5 million Swedish men, *Obesity* (2022). [DOI: 10.1002/oby.23378](#)

Provided by University of Gothenburg

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