

# Low BMI and malnutrition, but not obesity, are risk factors for older adults dying from COVID-19

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Variable	COVID-19				Non-COVID-19			
	N	Odds ratio		p	N	Odds ratio		p
Age	1409				8622			
Sex								
Women	765				5247			
Men	644				3375			
Number of diseases	1409				8622			
CCI	1409				8622			
HFRS	1409				8622			
Number of drugs	1409				8622			
Wave								
1st	846				5484			
2nd	563				3138			
BMI								
Normal weight, 18.5<BMI<25.0	709				4408			
Underweight, BMI<18.5	112				847			
Overweight, 25.0<BMI<30.0	394				2228			
Obese, BMI>30.0	194				1139			

Figure 1. The fully adjusted mortality risk model for the BMI analysis in geriatric patients hospitalized for COVID-19 (n = 1409, 112 died) and other causes (n = 8622, 67 died). Abbreviations: BMI = body mass index, CCI = Charlson comorbidity index, HFRS = Hospital Frailty Risk Score. Credit: DOI: 10.1016/j.clnu.2021.07.025

A recent study published in *Clinical Nutrition* shows that low BMI and malnutrition are risk factors for in-hospital mortality in geriatric COVID-19 patients. The study was performed at Karolinska Institutet in collaboration with Theme Inflammation & Aging at Karolinska University Hospital and geriatric clinics in the Stockholm Region.

These results are important as information on the groups with the highest mortality, i.e. the very old and [frail patients](#), is underrepresented. For

example, obesity is a risk factor in COVID-19 infection in younger adults but we instead found that low BMI and malnutrition increased the risk of in-hospital mortality in geriatric COVID-19 patients who were mostly older than 75 years, says Ph.D. Laura Kananen, a researcher at the Department of medical epidemiology and biostatistics, KI.

## **COVID-19 in hospitalized geriatric patients**

During the first COVID-19 wave in the spring 2020 in Sweden, researchers at Karolinska Institutet reported that in-hospital mortality was 24% among older hospitalized geriatric patients. The risk of death was almost doubled for patients classified as frail according to the Clinical Frailty Scale (CFS) as compared to non-frail older patients. In these patients, [acute kidney injury](#) and multimorbidity were also strong [risk factors](#) for death.

## **BMI and nutritional status as risk factors?**

The role of body composition and nutritional status in COVID-19 pathology has not been characterized well in hospitalized [older adults](#) (>65 years). Therefore, in our study, we analyzed the associations of body mass index, and nutritional status assessed using Mini Nutritional Assessment-Short Form (MNA-SF) with in-geriatric [hospital mortality](#) in older patients treated for COVID-19. As a reference, the analyses were performed also in older patients who were hospitalized for other causes than COVID-19 in the same geriatric hospitals during the same time period. Data in the analysis comprised medical records of ~10 000 patients in Stockholm during the first two pandemic waves. Age range of the patients was from 65 to 105 years, and their median age was 83 years. Follow-up of survival was short, i.e., only the hospitalization period.

The major finding of this study was that indicators of undernutrition;

i.e., underweight (BMI

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