

## Risk factors for severe and fatal COVID-19 among patients admitted to an Italian hospital

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### Background:

The epidemic of COVID-19 has spread dramatically affecting more than 140 million people and leading to more than 3 million deaths. We aimed to investigate what factors pose a risk for disease severity and death.

### Methods:

We prospectively included patients with laboratory-confirmed COVID-19 from San Marco Hospital (Catania, Italy), who had been admitted by Dec 31, 2020. Demographic, clinical, treatment, and laboratory data, were collected and compared between severe and non-severe patients, as well as between survivors and non-survivors. We used univariable and multi-variable methods to explore the risk factors associated with disease severity and death.

### Results:

Overall, 463 patients were included, of whom 33.7% had severe disease and 14.0% died in hospital. Patients with severe disease were older ( $p < 0.001$ ) and more likely to have had heart failure ( $p = 0.038$ ). With respect to the risk of death, increasing age, hypertension, diabetes, ischemic heart disease, atrial fibrillation, heart failure, chronic obstructive pulmonary disease, cancer, and chronic renal failure were more common among non-survivors ( $p$ -values  $< 0.05$ ). In particular, a logistic regression model confirmed age (OR = 1.14; 95%CI=1.10-1.20;  $p < 0.001$ ) and heart failure (OR = 14.8; 95%CI=2.7-80.8;  $p = 0.002$ ) as the main risk factors for death. The comparison between the first and the second waves of the epidemic did not reveal differences in demographic and clinical characteristics, however, the treatment approach has changed significantly.

### Conclusions:

The risk of severe and/or fatal COVID-19 was higher among older patients with comorbidities. These findings lay the foundation for prediction models that could inform shielding policies and vaccine prioritisation strategies.

### Key messages:

- The risk of severe and fatal COVID-19 is substantially elevated among older patients with previous comorbidities.
- These findings are important to inform shielding policies and vaccine prioritisation strategies.