

To die with or to die for COVID-19 infection: what 2022 has taught us

Marco Bongiovanni¹, Sandra Simon¹, Beatrice Barda¹, Gladys Martinetti Lucchini², Caroline Di Benedetto¹, Giorgio Merlani³, Enos Bernasconi^{1,4}

¹Division of Infectious Diseases, Ente Ospedaliero Cantonale, Lugano, Switzerland; ²Department of Laboratory Medicine, Ente Ospedaliero Cantonale, Bellinzona, Switzerland; ³Cantonal Service for Public Health, Bellinzona, Switzerland; ⁴University of Geneva and University of Southern Switzerland, Lugano, Switzerland.

Background Several variants of the virus appeared during the COVID-19 pandemic. The Omicron variant had a lower burden of hospitalization and mortality. Nonetheless, few data on the hospitalization and mortality rate linked to the Omicron variant are available. Our study aims at gathering and evaluating the predictive factors associated with mortality.

Methods We enrolled patients diagnosed with Omicron variant of SARS-CoV-2 who died in 2022. We divided patients in two groups according to the cause of death: COVID-19 related pneumonia (Group 1) and other causes (Group 2). The groups were compared according to demographics and clinical variables.

Results Overall, 217 COVID-19 subjects died in 2022, 101 (46.5%) in Group 1 and 116 (53.5%) in Group 2. Other causes included cancer (n=21), heart failure (n=19), septic shock (n=18), myocardial infarction (n=15), stroke (n=14), pneumonia (n=8), cerebral hemorrhage (n=7), and others (n=14). Median age and median BMI were comparable in the two groups. Patients in Group 1 had a lower median number of replication cycles (20.7 vs 25.5, $p < 0.01$) and a longer median time of hospitalization (10.5 vs 7 days, $p = 0.04$). Mortality in Group 1 was significantly higher in unvaccinated patients (Group 1: fully vaccinated 55, not vaccinated 37, unknown 9; Group 2 fully vaccinated 88, not vaccinated 16, unknown 12, $p < 0.0001$).

	Group 1 n (%)	Group 2 n (%)
Overall deaths	101	116
COVID-19 pneumonia	101 (100%)	
Other causes		
Cancer		21 (18.1)
Heart failure		19 (16.4)
Septic shock		18 (15.5)
Myocardial infarction		15 (13.0)
Stroke		14 (12.0)
Non-COVID-19 pneumonia		8 (6.9)
Cerebral hemorrhage		7 (6.0)
Others		14 (12.1)

Conclusions Despite being less aggressive, patients die from the COVID-19 Omicron variant. Whether COVID-19 infection is a cofactor in cardiovascular disease deaths will be further investigated.

It is worth to notice that a broad vaccination coverage is needed, especially for frail patients.