



30-DAY MORTALITY IN PATIENTS HOSPITALISED WITH COVID-19: A RETROSPECTIVE STUDY FOR THE ITALIAN PROVINCE OF BOLZANO

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In early 2020, Italy was one of the countries most affected by the severe acute respiratory syndrome Coronavirus-2 (SARS-CoV-2) due to COVID-19 infection. As in other Italian regions, the rise in COVID-19 cases in the small province of Bolzano, located on the border between Italy and Austria, led to significant pressure on hospital resources starting from February 2020. Bolzano's prevalence rate per 100,000 population exceeded the national average in November 2020 (over 2,000 vs about 1,300), in January-February 2021 (over 2,600 vs about 800), and from November until mid-December 2021 (1,200 vs about 500). However, from February 2022, it consistently remained below the national average. Several studies showed that the symptoms associated to COVID-19 disease, can be mild (fever, cough, sore throat, headache, muscle pain) or severe (dyspnea, pneumonia) thus requiring hospitalization. Old age, male sex, hypertension, diabetes and coronary heart disease were classified as risk factors for hospitalization and mortality in COVID-19 patients. The aim is to analyse how the different waves have impacted on the 30-day mortality for hospitalised patients.

COHORT

- Admissions to local hospitals for residents' patients with COVID-19 diagnosis from 23.02.2020 (first official case COVID-19 in the province of Bolzano) to 30.09.2022
- COVID-19 diagnosis code ICD-9-CM were defined by Ministerial Decree on 28.10.2020

Source: Hospital Discharge Administrative Databases

STATISTICAL ANALYSIS

- Cox proportional hazards model (Time dependent Covariates)
- Cox model is able to estimate the effects of the covariates on the outcome over time



FIRST
ADMISSION

OUTCOME:
30-day mortality

COVARIATES

- Age
- Sex → 0 = M; 1 = F
- Length of Stay (LOS) → days
- Admission to Intensive Care Unit (ICU) → 1 = yes; 0 = no
- Admission to Sub-Intensive Care Unit (SICU) → 1 = yes; 0 = no
- Vaccination → 1 = yes; 0 = no



MEDIAN AGE: 75 (60-84)

7,882 FEMALE: 3,662 (46.4%)

1,202
(15.2%)

OUTCOME:
30-day mortality

	23/02/2020 31/05/2020	01/06/2020 30/09/2020	01/10/2020 31/12/2020	01/01/2021 31/05/2021	01/06/2021 31/10/2021	01/11/2021 31/03/2022	01/04/2022 31/05/2022	01/06/2022 30/09/2022
	1st WAVE		2nd WAVE		3rd WAVE		4th WAVE	

	798	75	1,830	1,989	286	1,668	323	913
PATIENTS								
FEMALE (n, %)	330 (41.3)	39 (52.0)	834 (45.6)	863 (42.0)	130 (45.5)	824 (49.4)	171 (52.9)	471 (51.6)
MEDIAN AGE (IQR)	73 (58-82)	58 (48-73)	77 (63-84)	73 (58-82)	65.5 (49-82)	75 (58-84)	78 (59-86)	80 (69-86)
30 DAY MORTALITY (n, %)	162 (20.3)	2 (2.7)	361 (19.7)	263 (13.2)	28 (9.8)	250 (15.0)	31 (9.6)	105 (11.5)
MEDIAN LOS (IQR)	13 (6-24)	14 (5-22)	12 (7-23)	12 (7-23)	11 (5-22)	10 (5-21)	7 (3-17)	7 (4-14)

COX MODEL

VARIABLE	HR (IC 95%)
AGE	1.092 (1.085 – 1.098)
FEMALE	0.712 (0.633 – 0.801)
ICU	4.995 (4.189 – 5.956)
SICU	2.019 (1.700 – 2.393)
VACCINATION	0.609 (0.504 – 0.736)
LOS	0.922 (0.915 – 0.929)

- The first wave has the highest percentage of 30-day mortality (20.3)
- As the age increases, the risk of death increases (HR greater than 1 in all waves)
- Lower risk of death for women
- LOS decreased as the waves passed, from 13 days in the first waves to 7 in the last
- Vaccination is a protective predictor
- Mortality risk decreases with increasing LOS (HR less than 1 in all waves)
- The admission in ICU or SICU increases significantly the risk of death

The study supports the hypothesis that the male sex and the increase in age represent a risk factor for mortality independently of pandemic waves. Data shows that the impact of COVID-19 seems to be more aggressive in the first wave, probably due to the infection that, at the time not completely known, has affected many old persons with chronic diseases, which had to be hospitalized, with a consequent high pressure to the hospitals. By the introduction of the first vaccines in 2021 and by the improvement of the primary cares, data highlight that, even if the age of the patients has been always high, the length of stay has decreases; the hospital care became more successful leading to a reduction of the 30-day mortality.

CONCLUSIONS

