

LETTER TO THE EDITOR

Open Access



The incremental impact of comorbidities in COVID-19-related deaths compared to patients dying from cancer or cardiovascular disease

Laura Pighi¹, Giuseppe Lippi^{1*}  and Camilla Mattiuzzi²

Keywords Mortality, COVID-19, Comorbidities

To the Editor,

Several lines of evidence attest that comorbidities may substantially influence the clinical course of coronavirus disease 2019 (COVID-19) [1]. Nevertheless, there is no evidence for a direct comparison between the impact of the total number of comorbidities and the less favorable outcome of COVID-19 compared to other common pathologies.

To this end, we performed an electronic search on the website of the Italian National Institute of Statistics (ISTAT), under the menu item “Number of pathologies for initial cause of death” [2], which compiles national statistics on deaths based on marital status and registry sources. The search focused on COVID-19 and on the two leading causes of death in Italy and the rest of the world (i.e., cardiovascular disease and cancer). The search was limited to the first two years of the pandemic (i.e., 2020 and 2021), using the European Short List for the causes of death “cardiovascular diseases”, “cancer” and “COVID-19”. The cumulative mortality for each of the three conditions was retrieved in absolute numbers,

the mean number of deaths was calculated between the 2020 and 2021 values (i.e., [Mean deaths] = ([deaths in 2020] + [deaths in 2021])/2), and this mean value was then stratified by the number of comorbidities reported in the registry at the time of death (from 1 to 6 or more). We used the number of deaths of patients with a single comorbidity to standardize the number of deaths of patients with more than one comorbidity, as follows: [number of deaths with “x” comorbidities]/[number of deaths with 1 comorbidity], where “x” represents the number of comorbidities at death. The study was conducted in accordance with the Declaration of Helsinki and was exempt from Institutional Review Board review because ISAT is an anonymized and publicly available database.

The results of this study are summarized in Fig. 1. Although the proportion of deaths in patients with more than one comorbidity increased progressively for all three pathologies, the ratio ranged from 4.8 to 12.1 for cardiovascular disease, from 5.0 to 12.5 for cancer, while the ratio for COVID-19 increased exponentially from 9.3 in patients with two comorbidities up to 136.7 in patients with six or more comorbidities.

The results of our analysis show that patients with cancer or cardiovascular disease have up to a 12-fold higher risk of dying from these pathologies when multiple comorbidities are present, but the risk of death with multiple comorbidities is much higher for COVID-19, increasing to over 130-fold for patients with six or more comorbidities. These findings imply that enhanced

*Correspondence:

Giuseppe Lippi
giuseppe.lippi@univr.it

¹ Section of Clinical Biochemistry, University of Verona, Piazzale L.A. Scuro, 10, Verona 37134, Italy

² Medical Direction, Rovereto Hospital, Provincial Agency for Social and Sanitary Services (APSS), Trento, Italy

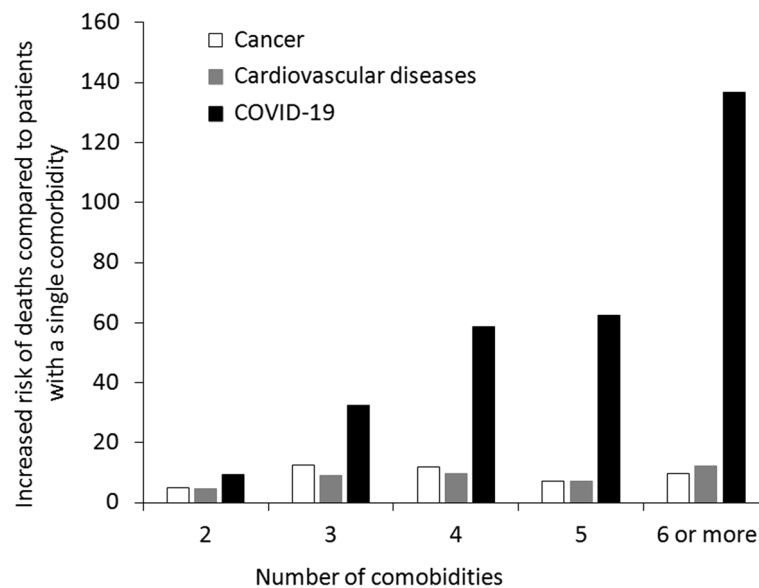


Fig. 1 Incremental risk of death from cardiovascular disease, cancer and coronavirus disease 2019 (COVID-19) in patients with more than one comorbidity compared to patients with a single comorbidity

prevention against the risk of contracting severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection needs to be planned especially in patients with comorbidities, while comprehensive clinical monitoring and more aggressive antiviral treatment may also be advisable in fragile patients who develop COVID-19.

Abbreviations

COVID-19	Coronavirus disease 2019
SARS-CoV-2	Severe acute respiratory syndrome coronavirus
ISTAT	Italian National Institute of Statistics

Acknowledgements

Not applicable.

Authors' contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by Giuseppe Lippi. The first draft of the manuscript was written by Giuseppe Lippi and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Funding

The author declares that they have no funding.

Availability of data and materials

The data will be available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

ISTAT is a de-identified and publicly available database and thereby no Ethics Committee approval or patients consent were necessary.

Competing interests

The author declares no competing interests.

Received: 12 July 2024 Accepted: 1 August 2024

Published online: 05 August 2024

References

- Ahmad W, Shabbiri K (2022) Two years of SARS-CoV-2 infection (2019–2021): structural biology, vaccination, and current global situation. *Egypt J Intern Med* 34:5. <https://doi.org/10.1186/s43162-021-00092-7>
- Italian National Institute of Statistics. Number of pathologies for the initial cause of death. Available at: <http://dati.istat.it/#>. Accessed 11 July 2024

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.