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LETTERS

Mortality from COVID-19

Mortalità per COVID-19

Key words: Covid-19 mortality, USA, Italy

Abstract

The differences of the epidemiology (incidence, case-to-death rate, mortality, etc) of COVID-19 between USA and Italy are analyzed taking into account the social, economic and sanitary characteristics of the two countries, both severely hit be the pandemic; and the causes of the so many different behaviors of the disease in each of them are discussed and explained.

Sir:

There is some evidence suggesting that strict social distancing measures and other interventions may limit morbidity and mortality related to COVID-19. In particular, physical distancing, wearing a mask, respiratory hygiene, hand hygiene, avoiding crowded spaces, and ensuring adequate ventilation have been consistently reported as the most effective measures to mitigate the risk of SARS-CoV-2 infection (1).

However, other factors, including population health interventions, country-specific socioeconomic factors, and healthcare capacity are associated with COVID-19 morbidity and mortality (2). Recent reports have highlighted that COVID-19 is currently the third leading cause of mortality in the USA, and that among the possible causes of this phenomenon is the lack of nationwide preventive strategies (first and foremost, the use of facial masks), one of the main factors responsible for the uncontrolled, widespread diffusion of COVID-19 in the USA (3, 4). Comparing these mortality data with those in Italy during the same period, surprisingly we discovered that the crude mortality rate (CMR) in Italy was higher than that reported at that time in the USA (83.4./100,000 inhabitants vs. 69.8/100,000 inhabitants, respectively) (5). As of August 30, 2020, the CMR for COVID-19 varied greatly across EU countries, with Belgium reporting the highest value (86.3/100,000), followed by the UK (68.5/100,000) and Spain (62.1/100,000) (6). In Italy the rates varied substantially in different regions, being 167.6/100,000 in Lombardy compared to 37.0/100,000 for the rest of the country. Among countries in which it was possible to estimate age-standardized rates, Sweden reported the highest, with a standardized mortality rate (SMR) of 61.6/100,000, followed by Italy (50.3/100,000), the Netherlands (41.4/100,000), Portugal (15.9/100,000), and Germany (10.1/100,000) (6).

While the USA had a lower COVID-19 mortality rate compared to the high-mortality countries in Europe during the early spring, after May 10, 2020 all high-mortality countries (e.g., UK, Italy, France, Spain, Belgium, the Netherlands, and Sweden) had fewer deaths per 100,000 inhabitants than the USA. For instance, between May 10 and September 19, 2020, Italy's death rate was 9.1/100,000, while the rate in the USA was 36.9/100,000 (7).

The Lombardy region reported the highest COVID-19 CMR (141.0/100,000) 70 days after the onset of the epidemic, followed by the Community of Madrid (132.8/100,000) and New York State (120.7/100,000). However, when taking age distribution into consideration, the highest SMR was observed in the State of New York (257.9/100,000), with lower figures in most of the European regions including the Milan area (141.0/100,000) (8, 9).

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It should be noted that Italy was the first country in the western world to be hit by the first pandemic wave and responded with a rigorous lock-down. The actions planned against COVID-19 were highly appreciated by the World Health Organization and were taken as a model by most European countries (10). Despite these stringent containment measures, we have recorded case fatality rates for SARS-CoV-2 infection higher than those reported in the USA (3.5% vs. 1.8%) (4). Differences in mortality rates can be related to several factors, including number of people tested, demographics and characteristics of the healthcare systems. Currently, the number of people tested for COVID-19 is higher in the USA than in Italy (749.2/1,000 vs. 445.3/1,000) (11). In 2017, life expectancy in Italy reached 83.1 years, compared to 78.5 years in USA, and it is well known that mortality from COVID-19 increases with age. Moreover, having one or more comorbidity is associated with increased severity of COVID-19. In this respect, a recent review shows that common underlying comorbidities are more prevalent in the USA than in Italy (e.g., hypertension 38.9 % vs 35.9 %; diabetes 23.2 % vs 12.6 %; COPD, 12 % vs. 4.6 %, respectively) (12). Mortality may rise as hospitals become overwhelmed and have fewer resources, as happened in northwest Italy at the very beginning of the epidemic, when the death-to-case rate was as high as 26 % (13). Although Italy's health system is highly regarded and has 3.2 hospital beds per 1,000 inhabitants (as compared with 2.8 in the USA), it has been impossible to meet the needs of so many critically ill patients simultaneously, particularly because of the limited availability of ventilator support (14). In addition, the COVID-19 pandemic has highlighted several shortcomings in the National Health Service in Italy, including those related to the availability of intensive care unit (ICU) beds. For example, according to 2012 data, Italy had 12.5 ICU beds per 100,000 inhabitants (15), while data for 2015 in the USA documented up to 34.2 critical care beds per 100,000 inhabitants (16). To be underlined, in response to these needs, the Lombardy Region has more than doubled the number of beds, both bordinary hospital beds and intensive care beds (9).

Finally, differences in the availability of effective treatments could be responsible, at least in part, for the observed differences in mortality rates. This could be the case of convalescent plasma, which was approved by the Food and Drug Administration for emergency use in COVID-19 on August 23 2020, following the publication of the US Expanded Access Program which documented its effectiveness and safety in a large number of hospitalized patients with severe COVID-19 (17). Unfortunately, convalescent plasma found little place in Italy, where it has been administered only in experimental trials or for compassionate use. By contrast, the large number of patients transfused in the USA (94,287 patients infused as of January 5, 2021: https://www.uscovidplasma.org/) could be an additional factor responsible for their lower mortality rate than in Italy, despite the lesser use of preventive measures in the USA.

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References

1. Mahase E. Covid-19: Are cloth masks still effective? And other questions answered. BMJ 2021; **372**: n432. doi: 10.1136/bmj.n432.
2. Chaudhry R, Dranitsaris G, Mubashir T, Bartoszko J, Riazi S. A country level analysis measuring the impact of government actions, country preparedness and socioeconomic factors on COVID-19 mortality and related health outcomes. EClinicalMedicine 2020 Aug; **25**: 100464. doi: 10.1016/j.eclinm.2020.100464. Epub 2020 Jul 21.
3. Woolf SH, Chapman DA, Lee JH. COVID-19 as the Leading Cause of Death in the United States. JAMA 2021; **325**(2): 123-4. doi: 10.1001/jama.2020.24865.
4. Koh HK, Geller AC, VanderWeele TJ. Deaths From COVID-19. JAMA 2021; **325**(2): 133-4. doi: 10.1001/jama.2020.25381.

5. Johns Hopkins University. Coronavirus Resource Center. Mortality Analyses. Mortality in the most affected countries. Last update January 20 2021. Available at: https://coronavirus.jhu.edu/data/mortality [Last accessed: 2021 Mar 15].
6. Villani L, McKee M, Cascini F, Ricciardi W, Boccia S. Comparison of Deaths Rates for COVID-19 across Europe During the First Wave of the COVID-19 Pandemic. Front Public Health 2020; **8**: 620416. doi: 10.3389/fpubh.2020.620416.
7. Bilinski A, Emanuel EJ. COVID-19 and Excess All-Cause Mortality in the US and 18 Comparison Countries. JAMA 2020; **324**(20): 2100-2. doi: 10.1001/jama.2020.20717.
8. Signorelli C, Odone A, Gianfredi V, et al. COVID-19 mortality rate in nine high-income metropolitan regions. Acta Biomed 2020; **91**(9-S): 7-18. doi: 10.23750/abm.v91i9-S.10134.
9. Signorelli C, Odone A, Gianfredi V, et al. F. The spread of COVID-19 in six western metropolitan regions: a false myth on the excess of mortality in Lombardy and the defense of the city of Milan. Acta Biomed 2020; **91**(2): 23-30. doi: 10.23750/abm.v91i2.9600.
10. ANSA. WHO pays tribute to Italy for COVID-19 response. Sept 25 2020. Available at: https://www.ansa.it/english/news/general_news/2020/09/25/who-pays-tribute-to-italy-for-covid-19-response_2c44490e-489b-4836-933a-d0fc79cbe753.html [Last accessed: 2021, Mar 15].
11. Hasell J, Mathieu, E, Beltekian D, *et al.* A cross-country database of COVID-19 testing. Sci Data 2020; **7**(1): 345. doi: 10.1038/s41597-020-00688-8.
12. Bajgain KT, Badal S, Bajgain BB, Santana MJ. Prevalence of comorbidities among individuals with COVID-19: A rapid review of current literature. Am J Infect Control 2020; **49**(2): 238-46. doi: 10.1016/j.ajic.2020.06.213. Epub ahead of print.
13. Grasselli G, Zangrillo A, Zanella A, et al. Baseline Characteristics and Outcomes of 1591 Patients Infected With SARS-CoV-2 Admitted to ICUs of the Lombardy Region, Italy. JAMA 2020; **323**(16): 1574-81. doi: 10.1001/jama.2020.5394.
14. Rosenbaum L. Facing Covid-19 in Italy - Ethics, Logistics, and Therapeutics on the Epidemic's Front Line. N Engl J Med 2020; **382**(20): 1873-5. doi: 10.1056/NEJMp2005492. Epub 2020 Mar 18.
15. Rhodes A, Ferdinande P, Flaatten H, Guidet B, Metnitz PG, Moreno RP. The variability of critical care bed numbers in Europe. Intensive Care Med 2012; **38**(10): 1647-53. doi: 10.1007/s00134-012-2627-8. Epub 2012 Jul 10.
16. Wallace DJ, Angus DC, Seymour CW, Barnato AE, Kahn JM. Critical care bed growth in the United States. A comparison of regional and national trends. Am J Respir Crit Care Med 2015; **191**(4): 410-6. doi: 10.1164/rccm.201409-1746OC.
17. Joyner MJ, Bruno KA, Klassen SA, et al. Safety Update: COVID-19 Convalescent Plasma in 20,000 Hospitalized Patients. Mayo Clin Proc 2020; **95**(9): 1888-95. doi: 10.1016/j.mayocp.2020.06.028. Epub 2020 Jul 19.

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