



LETTERS

COVID-19

Covid-19 fatality is likely overestimated

Joshua D Niforatos *resident physician*¹, Edward R Melnick *assistant professor*², Jeremy S Faust *instructor in emergency medicine*³

¹Department of Emergency Medicine, Johns Hopkins School of Medicine, 1830 E Monument Street, Suite 6-100, Baltimore, MD 21205, USA;

²Department of Emergency Medicine, Yale School of Medicine, New Haven, CT, USA; ³Department of Emergency Medicine, Brigham and Women's Hospital, Boston, MA, USA;

The final case fatality rate (CFR) from SARS-CoV-2, the virus that causes covid-19, will likely be lower than those initially reported.¹ Previous reviews of H1N1 and SARS show the systematic inflation of early mortality estimates.^{2,3} Early estimates of H1N1's mortality were susceptible to uncertainty about asymptomatic and subclinical infections, heterogeneity in approaches to diagnostic testing, and biases in confounding, selection, detection, reporting, and so on.^{2,3} These biases are difficult to overcome early in a pandemic.³

We read Xu and colleagues' report of 62 cases of covid-19 outside of Wuhan, China, with interest, as no patients died in the study period.⁵ Compared with a report of the 72 314 cases throughout China, the marked differences in outcomes from Hubei (the province of which Wuhan is the capital) compared with all other provinces are worth a brief discussion.⁴

The CFR in China (through 11 February) is reported as 2.3%.^{1,5} The CFR among the initial Wuhan cohort was reported as 4.3%, with a rate of 2.9% in Hubei province.^{1,5} But outside Hubei the CFR has been 0.4%. Deaths occurred only in cases deemed "critical." Importantly, the CFR from these reports is from infected, syndromic people presenting to healthcare facilities, with higher CFRs among older patients in hospital (8%-14.8% in the Wuhan cohort).

As accessibility and availability of testing for the novel coronavirus increases, the measured CFR will continue to drop, especially as subclinical and mild cases are identified.⁶⁻⁸

Alternatively, the CFR might not fall as much as in previous epidemics and pandemics, given the prolonged disease course of covid-19 or if mitigation measures or hospital resources prove inadequate.⁹⁻¹²

As with other pandemics, the final CFR for covid-19 will be determined after the pandemic and should not distract from the

importance of aggressive, early mitigation to minimise spread of infection.

Competing interests: None declared.

Full response at: <https://www.bmj.com/content/368/bmj.m606/rr-5>.

- 1 Wang D, Hu B, Hu C, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China. *JAMA* 2020; 10.1001/jama.2020.1585. 32031570
- 2 Wong JY, Kelly H, Ip DK, Wu JT, Leung GM, Cowling BJ. Case fatality risk of influenza A (H1N1pdm09): a systematic review. *Epidemiology* 2013;24:830-41. 10.1097/EDE.0b013e3182a67448. 24045719
- 3 Lipsitch M, Donnelly CA, Fraser C, et al. Potential biases in estimating absolute and relative case-fatality risks during outbreaks. *PLoS Negl Trop Dis* 2015;9:e0003846. 10.1371/journal.pntd.0003846. 26181387
- 4 Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (covid-19) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. *JAMA* 2020; 10.1001/jama.2020.2648. 32091533
- 5 Xu XW, Wu XX, Jiang XG, et al. Clinical findings in a group of patients infected with the 2019 novel coronavirus (SARS-Cov-2) outside of Wuhan, China: retrospective case series. *BMJ* 2020;368:m606. 10.1136/bmj.m606.32075786
- 6 Majumder M. Case fatality rate (CFR) is time- and population-varying (Tweet). 2020. <https://twitter.com/maiamajumder/status/1235219601232887808>.
- 7 Deng X, Yang J, Wang W, Wang X, Zhou J, Chen Z, Li J, Chen Y, Yan H, Zhang J, Zhang Y. Case fatality risk of novel coronavirus diseases 2019 in China. *medRxiv* 20031005 [Preprint] 6 Mar 2020. <https://doi.org/10.1101/2020.03.04.20031005>.
- 8 Omori R, Mizumoto K, Nishiura H. Ascertainment rate of novel coronavirus disease (COVID-19) in Japan. *medRxiv* 20033183 [Preprint]. 10 Mar 2020. <https://doi.org/10.1101/2020.03.09.20033183>
- 9 Ding Y, Luo S, Zheng X, Ling P, Yue T, Liu Z, Weng J. Association of population migration and coronavirus disease 2019 epidemic control. *medRxiv* 20024661. 20 Feb 2020. <https://doi.org/10.1101/2020.02.18.20024661>.
- 10 Anderson RM, Heesterbeek H, Klinkenberg D, Hollingsworth TD. How will country-based mitigation measures influence the course of the COVID-19 epidemic? *Lancet* 2020; 10.1016/S0140-6736(20)30567-5. 32164834
- 11 Remuzzi A, Remuzzi G. COVID-19 and Italy: what next? *Lancet* 2020; 10.1016/S0140-6736(20)30627-9. 32178769
- 12 Dalton C, Corbett S, Katelaris A. Pre-emptive low cost social distancing and enhanced hygiene implemented before local covid-19 transmission could decrease the number and severity of cases. *SSRN* 2020;3549276. 10.2139/ssrn.3549276.

Published by the BMJ Publishing Group Limited. For permission to use (where not already granted under a licence) please go to <http://group.bmj.com/group/rights-licensing/permissions>