What's the best way to estimate and track COVID-19 mortality?

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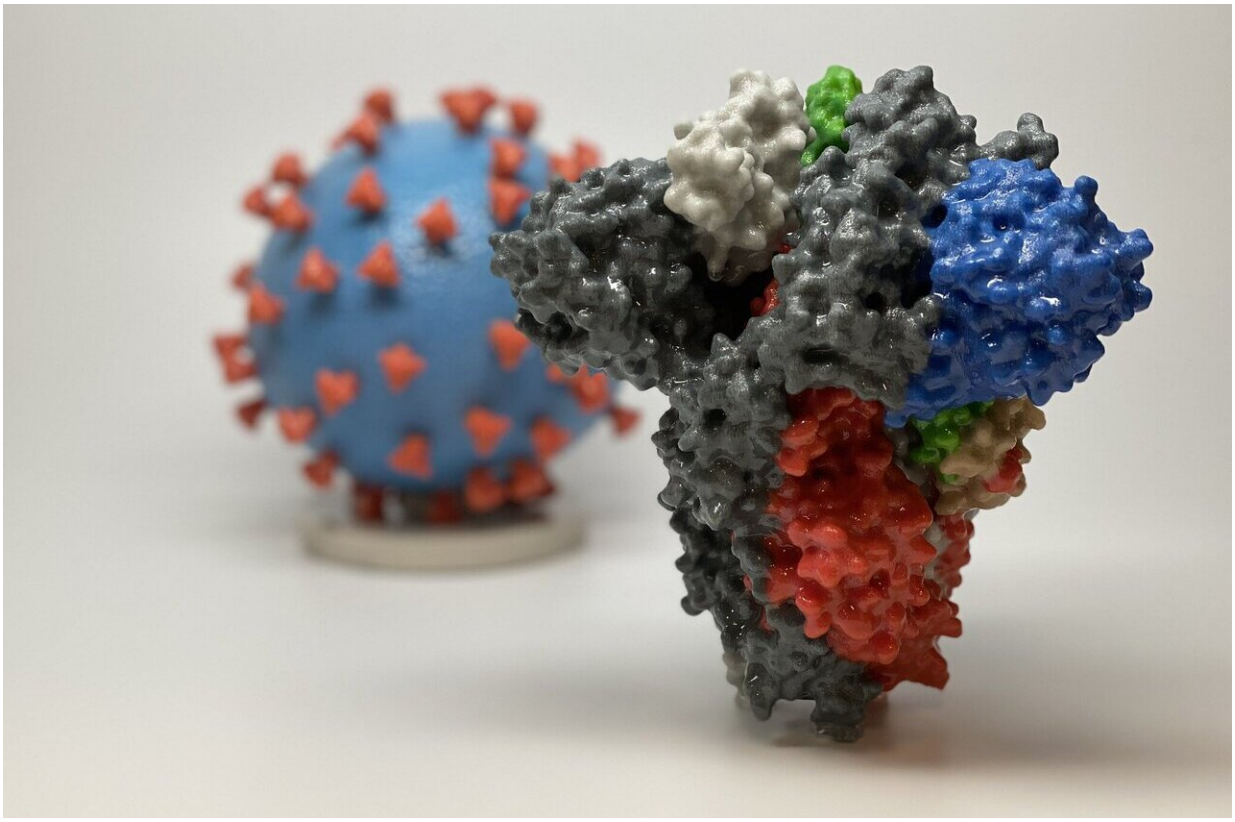

3D print of a spike protein of SARS-CoV-2, the virus that causes COVID-19—in front of a 3D print of a SARS-CoV-2 virus particle. The spike protein (foreground) enables the virus to enter and infect human cells. On the virus model, the virus surface (blue) is covered with spike proteins (red) that enable the virus to enter and infect human cells. Credit: NIH

When used correctly, the symptomatic case fatality ratio (sCFR) and the infection fatality ratio (IFR) are better measures by which to monitor COVID-19 epidemics than the commonly reported case fatality ratio (CFR), according to a new study published this week in *PLOS Medicine* by Anthony Hauser of the University of Bern, Switzerland, and colleagues.

Reliable estimates of the mortality from SARS-CoV-2 infection are essential to understand the COVID-19 epidemic and develop public health interventions. However, the commonly used CFR—the number of reported deaths divided by the number of reported cases—can be a misleading measure of mortality associated with COVID-19. In the new study, researchers developed a computational model of the dynamics of transmission of SARS-CoV-2 along with COVID-19 associated mortality. The model took into account the delay between infection and death, the increased diagnosis of disease in people with severe symptoms , and stratified data by age.

The researchers applied the model to Hubei province (China), Austria, Bavaria (Germany), Baden- Württemberg (Germany), Lombardy (Italy), Spain and Switzerland. In Hubei, the calculated IFR was 2.9% (95% credible interval [CrI] 2.4-3.5) while the CFR was 2.4%. In Europe, estimates of the IFR ranged from 0.5 (95% CrI 0.4-0.6) to 1.4% (95% CrI: 1.1-1.6) while the CFR ranged from 3.9% to 17.8%. Overall, estimates of sCFR and IFR were similar to each other and varied less geographically than the CFR.

"The CFR is not a good predictor of overall mortality from SARS-CoV-2 and should not be used for evaluation of policy or comparison across settings," the authors say. "The sCFR and IFR, adjusted for [the right biases], are measures that can be used to improve and monitor clinical and public health strategies to reduce the deaths from SARS-CoV-2 infection."

More information: Hauser A, Counotte MJ, Margossian CC, Konstantinoudis G, Low N, Althaus CL, et al. (2020) Estimation of SARS-CoV-2 mortality during the early stages of an epidemic: A modeling study in Hubei, China, and six regions in Europe. *PLoS Med* 17(7): e1003189. doi.org/10.1371/journal.pmed.1003189