VIEWPOINT

Assessment of Deaths From COVID-19 and From Seasonal Influenza

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As of early May 2020, approximately 65 000 people in the US had died of coronavirus disease 2019 (COVID-19),[1] the disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). This number appears to be similar to the estimated number of seasonal influenza deaths reported annually by the Centers for Disease Control and Prevention (CDC) (https://www.cdc.gov/flu/about/burden/preliminary-in-season-estimates.htm).

This apparent equivalence of deaths from COVID-19 and seasonal influenza does not match frontline clinical conditions, especially in some hot zones of the pandemic where ventilators have been in short supply and many hospitals have been stretched beyond their limits. The demand on hospital resources during the COVID-19 crisis has not occurred before in the US, even during the worst of influenza seasons. Yet public officials continue to draw comparisons between seasonal influenza and SARS-CoV-2 mortality, often in an attempt to minimize the effects of the unfolding pandemic.

The root of such incorrect comparisons may be a knowledge gap regarding how seasonal influenza and COVID-19 data are publicly reported. The CDC, like many similar disease control agencies around the world, presents seasonal influenza morbidity and mortality not as raw counts but as calculated estimates based on submitted International Classification of Diseases codes.[2] Between 2013-2014 and 2018-2019, the reported yearly estimated influenza deaths ranged from 23 000 to 61 000.[3] Over that same time period, however, the number of counted influenza deaths was between 3448 and 15 620 yearly.[4] On average, the CDC estimates of deaths attributed to influenza were nearly 6 times greater than its reported counted numbers. Conversely, COVID-19 fatalities are at present being counted and reported directly, not estimated. As a result, the more valid comparison would be to compare weekly counts of COVID-19 deaths to weekly counts of seasonal influenza deaths.

During the week ending April 21, 2020, 15 455 COVID-19 counted deaths were reported in the US.[5] The reported number of counted deaths from the previous week, ending April 14, was 14 478. By contrast, according to the CDC, counted deaths during the peak week of the influenza seasons from 2013-2014 to 2019-2020 ranged from 351 (2015-2016, week 11 of 2016) to 1626 (2017-2018, week 3 of 2018).[6] The mean number of counted deaths during the peak week of influenza seasons from 2013-2020 was 752.4 (95% CI, 558.8-946.1).[7] These statistics on counted deaths suggest that the number of COVID-19 deaths for the week ending April 21 was 9.5-fold to 44.1-fold greater than the peak week of counted influenza deaths during the past 7 influenza seasons in the US, with a 20.5-fold mean increase (95% CI, 16.3-27.7).[5,6]

The CDC also publishes provisional counts of COVID-19 deaths but acknowledges that its reporting lags behind other public data sources.[7] For the week ending April 11, 2020, data indicate that the number of provisionally reported COVID-19 deaths was 14.4-fold greater than influenza deaths during the apparent peak week of the current season (week ending February 29, 2020), consistent with the ranges based on CDC statistics.[6] As the CDC continues to revise its COVID-19 counts to account for delays in reporting, the ratio of counted COVID-19 deaths to influenza deaths is likely to increase.

The ratios we present are more clinically consistent with frontline conditions than ratios that compare COVID-19 fatality counts and estimated seasonal influenza deaths. Based on the figure of approximately 60 000 COVID-19 deaths in the US as of the end of April 2020, this ratio suggests only a 1.0-fold to 2.6-fold change from the CDC-estimated seasonal influenza deaths calculated during the previous 7 full seasons.[3] From our analysis, we infer that either the CDC's annual estimates substantially overstate the actual number of deaths caused by influenza or that the current number of COVID-19 counted deaths substantially understates the actual number of deaths caused by SARS-CoV-2, or both.

There are a number of considerations. Deaths from COVID-19 may be undercounted owing to ongoing limitations of test capacity or false-negative test results. When patients present late in the course of illness, upper respiratory tract samples are less likely to yield positive test results. Conversely, influenza counts may be less reliable because adult influenza deaths are not reportable to public health authorities, as is the case for COVID-19 deaths. Moreover, because adult influenza deaths are not reportable, epidemiologists must rely on surveillance mechanisms that attempt to account for potential underreporting.[8] Similarly, some cities, such as New York City, are beginning to report cases of both probable and confirmed COVID-19 deaths. The inclusion of both probable and confirmed deaths has led to revised mortality figures that, in effect, straddle the line between counting and estimating the number of COVID-19 deaths. It is also possible that some deaths that have been labeled as having been caused by COVID-19 are not due to COVID-19. For example, in areas where there is high-level community spread, such as New York City, if a patient is brought to an emergency department in cardiac arrest and has a known positive real-time reverse transcriptase polymerase chain reaction test result for SARS-CoV-2, and dies, that would be considered a COVID-19 death in local death counts. Whether that death may have occurred anyway is impossible to say. Eventually, a fuller

reckoning of the burden of disease that focuses on excess mortality, including both direct and indirect COVID-19–related deaths, will be helpful. That analysis will be most complete if it also considers the possibility of excess deaths owing to deferred care during the peak of the epidemic and the lack of capacity for care of patients without COVID-19 at overwhelmed hospitals.

Case fatality rates are another topic of confusion. Comparisons of the case fatality rates of SARS-CoV-2 and influenza are premature. Estimates of case fatality rates for COVID-19 range from less than 1% in some nations to approximately 15% in others. This wide range reflects limitations in calculating case fatality rates. These include failure to account for scarcity in testing (thereby falsely decreasing the denominator) and incomplete follow-up information for people who were critically ill but still alive when last assessed (thereby decreasing the numerator). Eventually, results from serologic studies will help to determine a more accurate denominator for the case fatality rate of SARS-CoV-2.

At present, the Diamond Princess cruise ship outbreak is one of the few situations for which complete data are available. For this outbreak, the case fatality rate as of late April 2020 was 1.8% (13 deaths out of 712 cases); age adjusted to reflect the general population, the figure would have been closer to 0.5%.[1,9] A case fatality rate of 0.5% would still be 5 times the commonly cited case fatality rate of adult seasonal influenza.[3,10]

Directly comparing data for 2 different diseases when mortality statistics are obtained by different methods provides inaccurate information. Moreover, the repeated failure of government officials and others in society to consider these statistical distinctions threatens public health. Government officials may rely on such comparisons, thus misinterpreting the CDC's data, when they seek to reopen the economy and de-escalate mitigation strategies. Although officials may say that SARS-CoV-2 is "just another flu," this is not true.

In summary, our analysis suggests that comparisons between SARS-CoV-2 mortality and seasonal influenza mortality must be made using an apples-to-apples comparison, not an apples-to-oranges comparison. Doing so better demonstrates the true threat to public health from COVID-19.

ARTICLE INFORMATION

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