ESTIMATING EXCESS MORTALITY FROM COVID-19

Reporting deaths from COVID-19 is important to monitor impact of the disease and guide response efforts. But confirmed COVID-19 deaths alone are unlikely to capture the full extent of the disease’s burden on a population. Analysis of excess mortality can help provide a more complete picture needed to support evidence-based policymaking.

WHY should you do this analysis?

Mechanisms for tracking the number of confirmed COVID-19 deaths are unlikely to capture all deaths related to the outbreak for several reasons:

- Some COVID-19 deaths may be incorrectly assigned a more general cause.
- People who die at home may never have been tested for the virus that causes COVID-19.
- Additional deaths may occur because health services are overtaxed by pandemic response. Though these deaths are not directly caused by COVID-19, they can be attributed indirectly to the outbreak, and are relevant to policy response.

To monitor the outbreak comprehensively and adjust response strategies accordingly, health ministries should supplement tracking of confirmed COVID-19 deaths by comparing deaths during the pandemic—from all causes and from respiratory diseases—to prior mortality levels. This calculation of excess mortality shows if there is an increase in mortality—from COVID-19 or other causes—which can help to indicate the scale, as well as the indirect impact, of the outbreak.

Reviewing mortality data can help ministries answer key operational question such as:

- Is there a significant difference between current all-cause mortality and the expected range?
- Is that difference increasing or decreasing over time?
- Are there specific types of mortality (e.g. in home vs. in facilities, or among defined demographic groups) that are significantly higher than the usual baseline?

WHEN should you do this analysis?

This analysis can commence immediately with the identification and processing of baseline data. When an outbreak is anticipated, current data should be processed on an ongoing weekly basis.
HOW do you complete this analysis?

Estimating the level of excess mortality is a relatively simple two-step analysis: (1) establish the baseline level of mortality and (2) compare current observed levels of mortality to baseline levels.

Establish baseline level of mortality: Mortality patterns demonstrate variations week to week within a year, even in the absence of an extraordinary event like the COVID-19 pandemic. When estimating the baseline mortality, analysts can account for this variation by doing the following:

1. Assemble week-by-week data on total deaths for several prior years (preferably the previous five, for example, 2015-2019).
2. Calculate the average weekly deaths across the years (i.e., the average of week 1 rates, week 2 rates, etc.).
3. Estimate a confidence interval around the average number of deaths.

Compare baseline and observed mortality: The previous step yields a baseline mortality and a “normal” range of variability around that baseline (i.e., the confidence interval). Ongoing analysis can determine whether (and by how much) observed weekly mortality levels during the outbreak are outside the expected range. This comparison can be extended to specific demographic groups and geographic sub-units, as data permits.

HOW can you effectively interpret findings for decision-making?

Comparing the current number of deaths to the baseline can provide understanding of the impact of COVID-19 on the population and on the health care system. The difference between the historical and current mortality burden can be presumed to be the excess that is related to the COVID-19 pandemic. Further analysis can identify specific groups of the population that are most affected. The results should preferably be interpreted in conjunction with data on public health and social measures as these may affect mortality patterns. Examining excess mortality burden in comparison to confirmed COVID deaths can also provide insights into gaps in disease surveillance.

A visualization that communicates these types of findings to decision-makers would simply show: (a) the range for the expected level of mortality and (b) the trajectory of actual mortality.

For example:

![Weekly deaths in 2020 by age group, Switzerland](image)

WHERE are additional resources that can help you with this analysis?


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1. Analysts can use an Excel spreadsheet tool available at [link](#) to perform this process.
2. Where historical data are not available, expected number of deaths can be estimated using additional information about the age and gender distribution of the population. Consult [link](#) for a guide for making this estimate.