

# Global death toll of COVID-19 pandemic may be more than three times higher than official records, estimates indicate

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More than three times as many people may have died worldwide as a result of the pandemic than official COVID-19 death records suggest,

according to an analysis published in *The Lancet*.

While the official COVID-19 death toll was 5.9 million between January 1, 2020, and December 31, 2021, the new study estimates 18.2 million excess deaths occurred over the same period, suggesting the full impact of the pandemic may have been far greater.

Excess deaths—the difference between the number of recorded deaths from all causes and the number expected based on past trends—are a key measure of the true death toll of the pandemic. While there have been several attempts to estimate excess mortality from COVID-19, most have been limited in geographical scope by the availability of data.

The new study provides the first peer-reviewed estimates of excess deaths due to the pandemic globally and for 191 countries and territories (and 252 subnational locations such as states and provinces) between January 1, 2020, and December 31, 2021.

Weekly or monthly data on deaths from all causes in 2021, 2020, and up to 11 prior years was obtained for 74 countries and 266 states and provinces through searches of government websites, the World Mortality Database, Human Mortality Database, and European Statistical Office. The data were used in models to estimate [excess mortality](#) due to the COVID-19 pandemic, including for locations with no weekly or monthly reporting of death data.

The analysis indicates that global excess deaths due to the pandemic may have totalled 18.2 million—more than three times higher than the official reported figure—by December 31, 2021. The excess death rate is estimated to be 120 deaths per 100,000 population globally, and 21 countries were estimated to have rates of more than 300 excess deaths per 100,000 population. Rates of excess deaths are estimated to have varied dramatically by country and region.

The highest estimated excess death rates were in Andean Latin America (512 deaths per 100,000 population), Eastern Europe (345 deaths per 100,000), Central Europe (316 deaths per 100,000), Southern sub-Saharan Africa (309 deaths per 100,000), and Central Latin America (274 deaths per 100,000). Several locations outside these regions are estimated to have had similarly [high rates](#), including Lebanon, Armenia, Tunisia, Libya, several regions in Italy, and several states in the southern U.S.. In stark contrast, some countries were estimated to have had fewer deaths than expected based on mortality trends in prior years, including Iceland (48 fewer deaths per 100,000), Australia (38 fewer deaths per 100,000), and Singapore (16 fewer deaths per 100,000).

With 5.3 million excess deaths, South Asia had the highest number of estimated excess deaths from COVID-19, followed by North Africa and the Middle East (1.7 million) and Eastern Europe (1.4 million). At the country level, the highest number of estimated excess deaths occurred in India (4.1 million), the U.S. (1.1 million), Russia (1.1 million), Mexico (798,000), Brazil (792,000), Indonesia (736,000), and Pakistan (664,000). These seven countries may have accounted for more than half of global excess deaths caused by the pandemic over the 24-month period. Among these countries, the excess deaths rates were highest in Russia (375 deaths per 100,000) and Mexico (325 deaths per 100,000), and were similar in Brazil (187 deaths per 100,000) and the U.S. (179 deaths per 100,000). Because of its large population, India alone accounted for an estimated 22% of the global total deaths.

Calculating the difference between excess death estimates and official reported deaths provides a measure of under-counting of the pandemic's true death toll. The ratio of excess deaths to reported deaths is much greater in South Asia (excess deaths 9.5 times higher than reported deaths) and sub-Saharan Africa (excess deaths 14.2 times higher than reported) than other regions.

The large differences between excess deaths and official records may be a result of under-diagnosis due to lack of testing and issues with reporting death data.

Distinguishing between deaths caused directly by COVID-19 and those that occurred as an indirect result of the pandemic is crucial, the authors say. Evidence from initial studies suggests a significant proportion of excess deaths are a direct result of COVID-19. However, deaths may also have occurred indirectly from causes such as suicide or drug use due to behavioral changes or lack of access to healthcare and other essential services during the pandemic. The impact of these various factors will vary by country and region.

To date, only 36 countries have released cause of death data for 2020. As data from more countries becomes available, it will be possible to better determine how many excess deaths were due directly to COVID-19 and how many occurred as an indirect result of the pandemic or responses to it.

Lead author Dr. Haidong Wang, of the Institute for Health Metrics and Evaluation, U.S., said: "Understanding the true death toll from the pandemic is vital for effective public health decision-making. Studies from several countries including Sweden and the Netherlands, suggest COVID-19 was the direct cause of most excess deaths, but we currently don't have enough evidence for most locations. Further research will help to reveal how many deaths were caused directly by COVID-19, and how many occurred as an indirect result of the [pandemic](#)."

The authors acknowledge a number of limitations to their study. A statistical model was used to predict excess deaths for countries that did not report weekly or monthly data on deaths from all causes, highlighting the need for direct measurements from these locations. Excess death estimates were calculated for the full study period only, and not by week

or month, due to lags and inconsistencies in reporting of COVID-19 [death](#) data that could drastically alter estimates.

**More information:** Estimating excess mortality due to the COVID-19 pandemic: a systematic analysis of COVID-19-related mortality, 2020–21, *The Lancet* (2022). [www.thelancet.com/journals/lan ...](http://www.thelancet.com/journals/lan...) [\(21\)02796-3/fulltext](https://doi.org/10.1016/S0140-6736(21)02796-3/fulltext)

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