

# Accurately calculating life expectancy since COVID-19

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The coronavirus pandemic caused over one million deaths in the United States from 2021 to 2023. According to the [Human Mortality Database](#), the world's leading scientific data resource on mortality in more developed countries, life expectancy at birth in the United States fell from 78.99 years in 2019 to 76.43 years in 2021.

This significant decline has been widely discussed in the media. A [press release](#) from the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics states that the [life expectancy](#) decline from 2019 to 2021 "was the biggest two-year decline in life expectancy since 1921-1923". Statements like this influence policymakers' understanding of the severity of the COVID-19 [pandemic](#) and impact how people perceive and react to pandemic-related policies.

To assess the magnitude of the COVID-19 pandemic in the United States, a common approach was to calculate the differences in life expectancy at birth during a pandemic year (i.e., 2021), and the year before the pandemic (2019). Such comparisons are misleading as they do not account for the duration of the pandemic.

The calculation of life expectancy in 2019 assumes that people spend their entire lives experiencing pre-pandemic [mortality rates](#), while the calculation of life expectancy in 2021 assumes that people live their entire lives in a permanent pandemic. However, people do not live their entire lives experiencing the mortality rates of 2021.

A new IIASA study published in *Biology Methods and Protocols* introduces a novel method for calculating life expectancy that reflects the experience of people enduring pandemic-level mortality rates for fixed durations.

"We call it hybrid life expectancy because it integrates both pandemic and pre-pandemic mortality rates," explains Sergei Scherbov, study co-author and IIASA Distinguished Emeritus Research Scholar in the IIASA Population and Just Societies Program.

The results show that the difference in life expectancy at birth in the United States in 2019 with and without a three-year-long pandemic is 0.01 years (approximately 3.65 days). Pandemics did not impact

mortality rates at younger ages, so a three-year-long pandemic has no effect on life expectancy at birth. Incorporating a three-year pandemic into life expectancy at age 65 results in a decrease of 0.18 years, roughly equivalent to 66 days compared to life expectancy without it.

"When we consider the length of the COVID-19 pandemic, the decrease in life expectancy is much smaller using the hybrid life expectancy method, compared to not taking the pandemic's duration into account," says Warren Sanderson, study co-author and IIASA guest researcher in the IIASA Population and Just Societies Program.

"People were misinformed about the effects of the COVID-19 pandemic on life expectancy. Media discussions about life expectancy were greatly exaggerated because they assumed the pandemic would last for people's entire lifetime."

The study recommends that life expectancy reductions calculated in the traditional way should not be used to assess the magnitude of pandemics. Instead, it advocates utilizing the hybrid life expectancy method for a more accurate assessment.

**More information:** Warren C Sanderson et al, The effect of the COVID-19 pandemic on life expectancy in the USA: An application of hybrid life expectancy, *Biology Methods and Protocols* (2023). [DOI: 10.1093/biomethods/bpad025](https://doi.org/10.1093/biomethods/bpad025)

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