

COVID-19 Impacts on Annual and Seasonal Mortality

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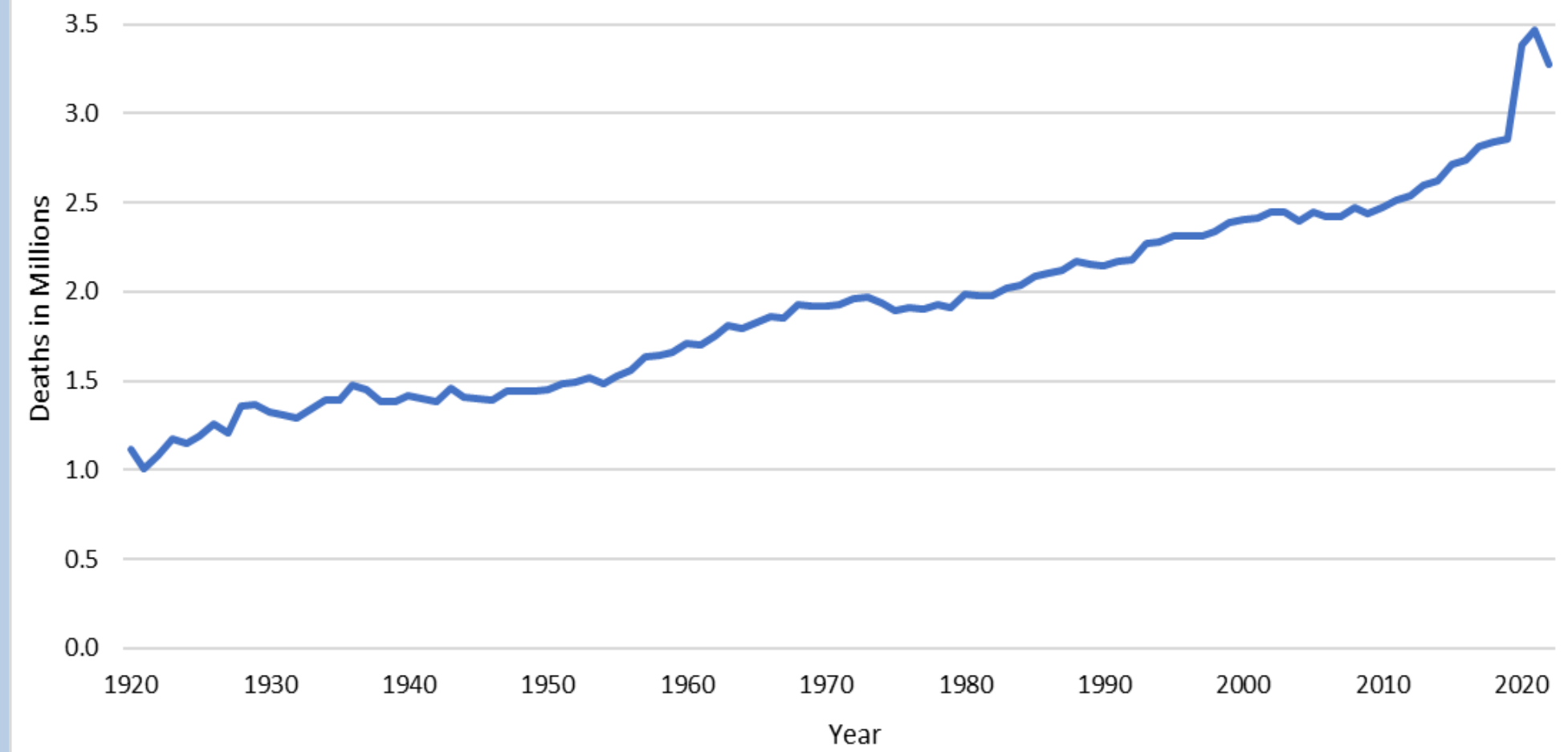
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INTRODUCTION

COVID-19 was declared a national emergency on March 13, 2020, and the impact on total deaths was already evident by April. By the end of 2020, the nation had witnessed the largest annual spike in mortality in 100 years. Deaths remained elevated into 2021 and the first months of 2022. Yet prior to the pandemic, mortality patterns were predictable. Using final and provisional data from the National Center for Health Statistics (NCHS) and the U.S. Census Bureau Vintage 2021 and 2022 population estimates, we show how COVID-19 has disrupted historical and seasonal mortality patterns. Additionally, we show how monthly deaths from 2020-2022 rise and fall with COVID-19 milestones such as public health measures and the emergence of new variants.

ANNUAL TRENDS IN MORTALITY

Figure 1. Annual Deaths in the United States: 1920-2022



Source: National Center for Health Statistics

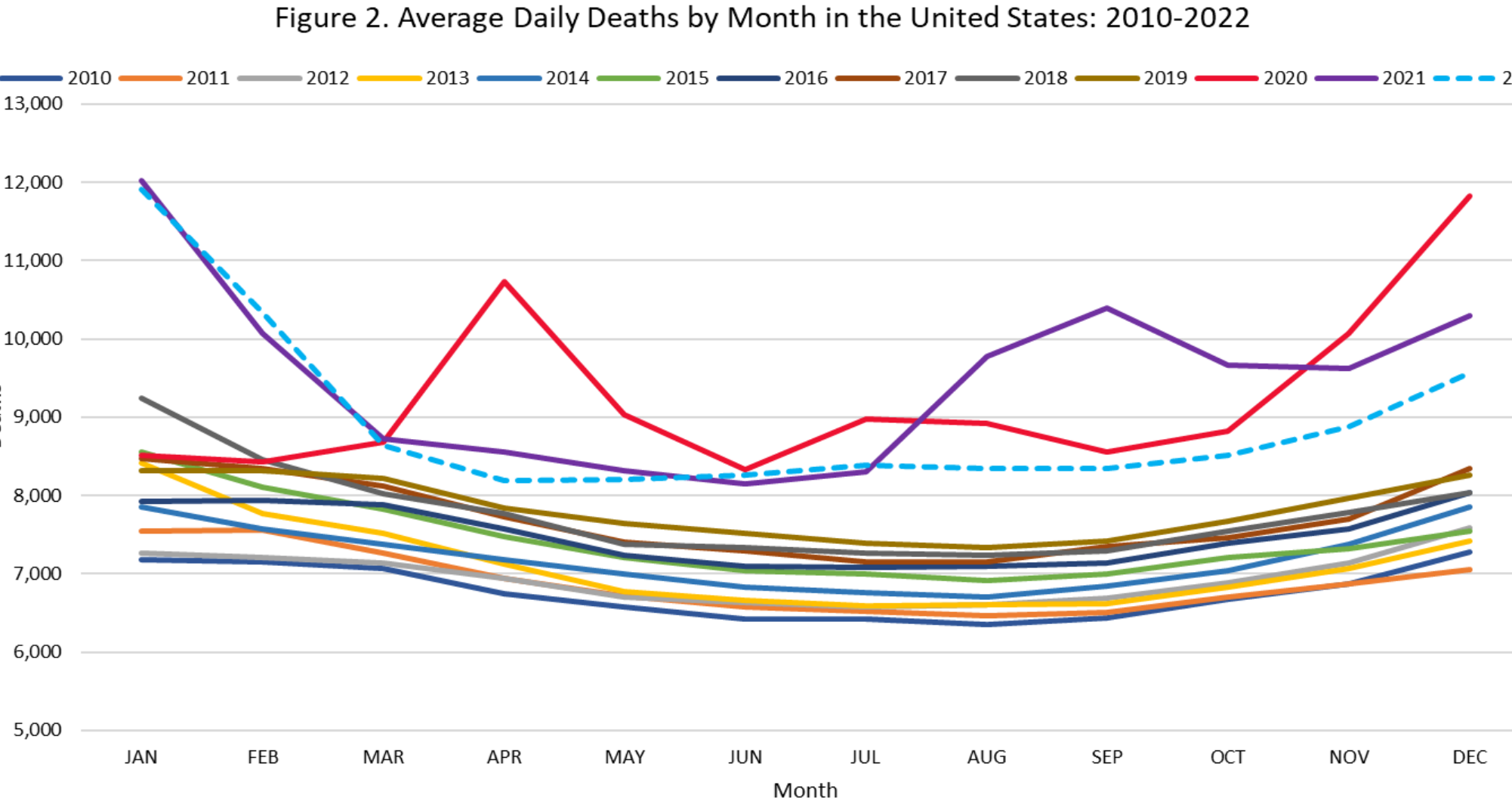
- The annual increase in deaths in 2020 was the largest in 100 years, when mortality spiked 18.5%.
- Prior to 2020, the largest increase in deaths was in 1928, when mortality increased by 12%.
- More recently, deaths increased by an average of 43,000 (1.6%) annually between 2010 and 2019.
- Mortality continued to increase in 2021, with the number of deaths 80,500 (2.4%) higher than in 2020.
- Deaths in 2022 decreased from 2021 by 5.6% (194,000), although these data are provisional. If this pattern holds when data become final, it will represent the first annual decrease in deaths since 2009 when deaths decreased by 1.4%.

SEASONALITY IN DEATHS

U.S. deaths typically exhibit regular annual cycles—normally declining in the late spring and summer months before increasing in the winter. Every year between 2010 and 2019, the months with the highest number of deaths were December, January, or February, while the lowest number of deaths occurred in July and August.

2020

- The highest number of deaths occurred in December, April, and November. April was the first month COVID-19 impacted mortality, although information about the virus was still limited.
- The lowest number of deaths occurred in June, February, and January. These months correspond to pre-pandemic or summer months, when decreased spread may have coincided with people spending increased time outdoors.



Source: U.S. Census Bureau, Vintage 2022 Population Estimates; National Center for Health Statistics. Notes: 2022 is dashed to highlight provisional data.

2021

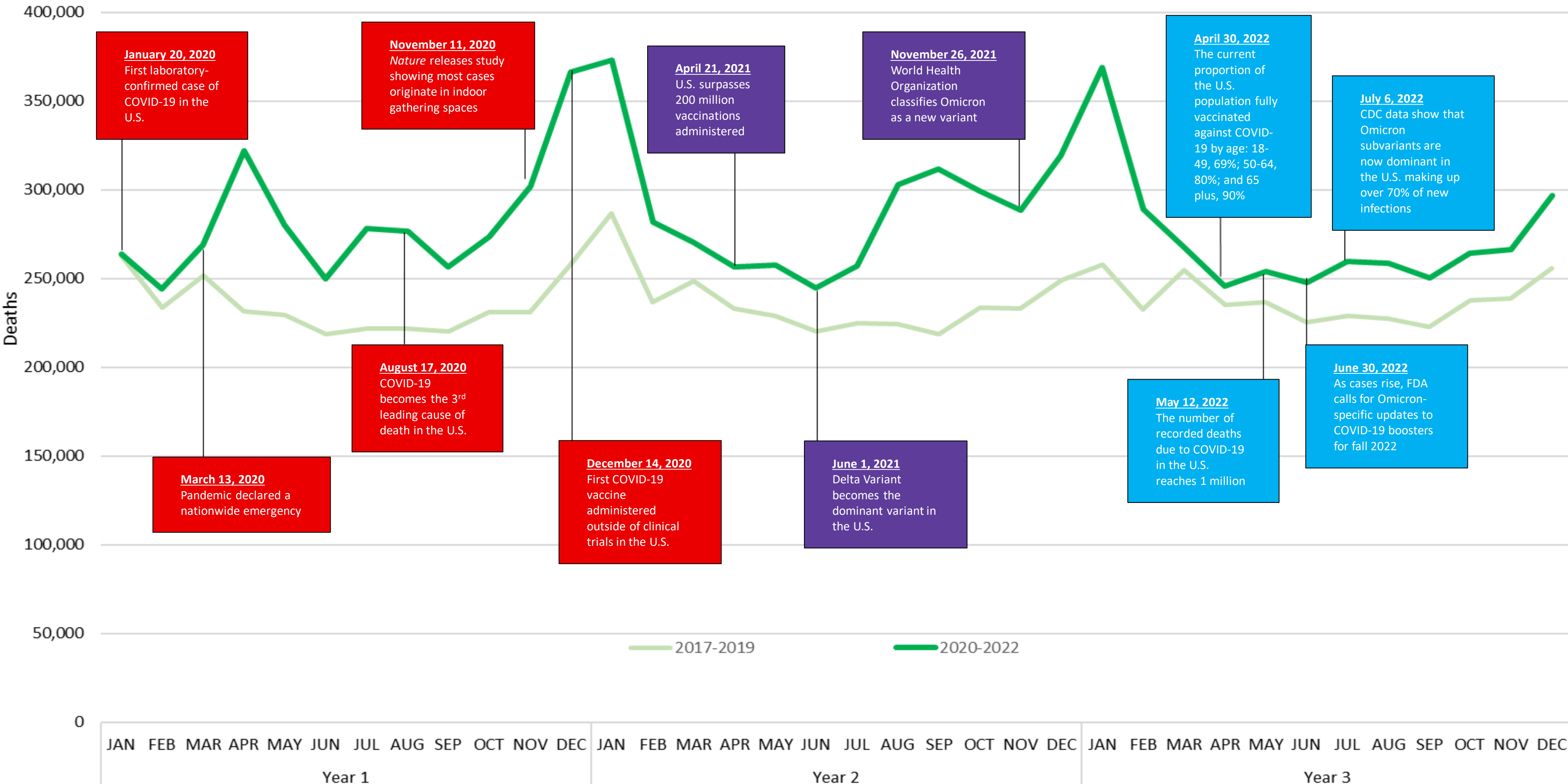
- The highest number of deaths occurred in January and September—before widespread availability of vaccines and the impact of the Delta variant.
- May, June, and July had the lowest deaths, corresponding again with summer months and a higher percentage of the U.S. population being vaccinated relative to earlier in 2021.

2022

- January through July more closely resemble monthly mortality patterns seen in 2021.
- The highest number of deaths occurred in January, February, and December, while the lowest occurred in April, May, and June.

COVID-19 TIMELINE

Figure 3. Monthly Deaths and Major Milestones in the COVID-19 Pandemic



Source: U.S. Census Bureau, Vintage 2022 Population Estimates (2010-2020); National Center for Health Statistics (2021-2022); CDC Museum COVID-19 Timeline <<https://www.cdc.gov/museum/timeline/covid19.html>>

CONCLUSIONS

In the three years since the pandemic was declared a national emergency, the U.S. has experienced over 1 million deaths caused by COVID-19, and it remained the third leading cause of death in 2021. Excess deaths from the virus have upended the regular patterns observed in mortality—shifting the seasonality and increasing the level of deaths. Although 2022 deaths are still elevated, provisional data show that pre-pandemic seasonality may be returning somewhat. The data presented here illustrate national-level deaths, but these mask variations in timing and spread of the pandemic across the nation, as well as its disproportionate impact across race, gender, and ethnic groups. The full extent of the pandemic’s impact on mortality will unfold in the coming years as more time passes and final data capturing COVID-19 deaths become available.



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