

US Trends in Death Rates from Neurological Diseases Ages 15-44

Data Source: CDC

Time Period: Yearly Data, 2010 - 2023

[Project Website](#)

[Full Report](#)

Summary Abstract

In this project, we investigate trends in death rates from neurological diseases (ICD-10 codes G00-G98) for all age groups in the US using data from the CDC (Centers for Disease Control and Prevention). We also perform a detailed analysis for younger individuals aged 15 to 44. We investigate trends in neurological diseases where these appear on the death certificate under multiple causes (MC) of death, or as the underlying cause (UC), as well as the trends in the ratio of multiple cause to underlying cause death rates.

For individuals aged 15 to 44 we show a rise in excess mortality from neurological diseases reported as the underlying cause of death, with a 4.4% increase in 2020, 10.0% in 2021, 9.9% in 2022 and 8.1% in 2023, with Z-Scores of 4.9, 11.1, 11.0 and 9.0 in 2020, 2021, 2022 and 2023, respectively, indicating highly statistically significant changes, particularly in 2021, 2022 and 2023.

When looking at excess neurological disease deaths reported as multiple cause (MC) of death, we observe that these track all-cause mortality rises, registering excess mortality of 11.2% in 2020, 20.6% in 2021, 14.7% in 2022 and 7.1% in 2023, which were also highly statistically significant. However, for excess neurological disease deaths reported as multiple cause of death, once deaths where COVID-19 was also reported are removed, we observe that these follow a very similar pattern of excess deaths to that observed for neurological deaths when reported as underlying cause.

We also show that excess deaths from neurological diseases as underlying cause occurred for most age groups, with the strongest effect in ages 15-44. For individuals 65 and older there appears to be no statistically significant rise in excess mortality.

The larger rise of excess death rates from neurological diseases reported as one of multiple causes compared to the underlying cause indicates that some deaths from these diseases are being brought forward by other causes, such as COVID-19-related deaths. Consequently, the rise in neurological disease deaths as underlying cause we report in the paper likely under-reports the described effect, particularly for older individuals.

The results indicate that from 2020, a novel phenomenon leading to increased neurological deaths appears to be present particularly in younger, working age individuals aged 15 to 44, which requires further investigation.

Detailed Analysis

[Read Now](#)



Trends in Underlying Cause of Death Rates

[Read Now](#)



Trends in Multiple Cause of Death Rates

[Read Now](#)



Comparison in Multiple Cause and Underlying Cause of Death Rates

Page 2 – US Trends in Death Rates from Neurological Diseases, Ages 15–44

Conclusions

- Our results show that the excess UC death rates from neurological diseases for individuals aged 15 to 44 age were 4.4% (Z-Score 4.9) in 2020, then rose to 10.0% (Z-Score 11.1) in 2021, 11.2% (Z-Score 12.4) in 2022 and 8.1% (Z-Score 9.0) in 2023. In 2020 we already observe a significant deviation from the 2010–2019 trend in UC death rates, and the excess UC death rates in 2021, 2022 and 2023 can be considered extreme occurrences due to their very high statistical significance. The results show a clear break from the prior historical trend in death rates from neurological diseases, pointing to a new phenomenon in action, worsening in 2022 and persisting through 2023.
- When analysing excess MC death rates from neurological diseases we show that these were 11.2% in 2020, which then rose to 20.6% in 2021 before subsiding to 14.7% in 2022 and 7.1% in 2023. These numbers track closely the rises in all-cause mortality which we mentioned in Figure 4, and are closely associated with COVID-19-related deaths as was confirmed by the MC* analysis. When analysing MC* death rates from neurological diseases (where COVID-19 deaths are excluded) we show that these followed a similar pattern to UC deaths rates, suggesting that the rises in excess MC* death rates were driven by the rises in excess UC death rates.
- Of note, the larger rise in MC death rates from neurological diseases when compared with UC death rates implies that there was a pull forward effect due to the early deaths of the most fragile individuals of the 15–44 age group with neurological diseases. Consequently, we would expect that this would lead to lower (or even negative) excess UC death rates from neurological diseases in subsequent years, which was contrary to what has so far occurred.
- How can we explain the excess UC deaths from neurological diseases in 2020, 2021, 2022 and 2023? In 2020, this could be explained by deaths from health effects related to the pandemic management measures such lockdowns and lack of medical care, or other related factors such as stress, less exercise, worse food habits, or from under-diagnosed COVID-19 itself, or related side effects.
- The acceleration in excess death rates from neurological diseases in 2021, 2022 and 2023 is more difficult to explain due to COVID-19 on its own. Given the case studies of neurological adverse events following COVID-19 vaccination cited in the literature, one possible factor could be adverse effects of the COVID-19 vaccines.

Suggestions for Further Research

- Given the literature showing the emergence of neurological diseases following COVID-19 vaccination cited above, future studies should focus on COVID-19 vaccinated and unvaccinated individuals and whether the vaccination rollout or COVID-19-related conditions such as Long COVID are contributing factors to the ongoing rise in neurological-related deaths.
- For a more detailed analysis please [read our full paper at Research Gate.](#)

Related Projects:

- [US - Death Trends from Neoplasms, Ages 15-44](#)
- [US - Death Trends from Neoplasms for all ages and detailed analysis of 75-84](#)
- [US - Estimating Covid-19 Over-Reporting as Underlying Cause of Death](#)
- [UK - Death and Disability Trends from Malignant Neoplasms, Ages 15-44](#)
- [UK - Death Trends from Malignant Neoplasms - Analysis of Individual Causes, Ages 15-44](#)
- [UK - Death Trends from Neurological Diseases, Ages 15-49](#)