Page Content

# ​​​​​​​​​​​​​​​​​​​​​​​​​​​​​​​​​​​​​​​COVID-19 Reported Deaths​: Using Shewhart Control Charts to Understand Variation

​IHI and our colleagues have developed a data dashboard depicting reported deaths from COVID-19 globally using Shewhart control charts.

For each country, and for each state and territory in the United States, the Shewhart control charts model the trajectory of COVID-19 reported deaths to help detect when the pandemic is entering a rapid growth phase and when exponential growth is ending. Data in the display is updated daily.

Because the Shewhart control chart method and theory are designed to distinguish between random and non-random variation, they are ideally suited to help decision makers understand if the reported number of daily deaths is stable (i.e., modeled by random variation) or unstable (i.e., modeled by non-random variation).

The dashboard illustrates the power of using Shewhart control charts, a cornerstone of improvement methods, in a practical and accessible way to inform decision making.

To have an accurate and complete picture of the impact of COVID-19, mortality and infection data stratified by race, ethnicity, and language is a necessity. Communities of color and other marginalized populations are bearing a disproportionate burden of disease. [Data that show inequities](https://www.ama-assn.org/about/leadership/why-racial-and-ethnic-data-covid-19-s-impact-badly-needed) call us to address access, quality, policies, and practices that contribute to the disparate impact and outcomes.

We hope that the dashboard and this analysis is useful to subject matter experts, decision makers, care providers, and the general public.

**Display Instructions:**

* Learn more about the methodology in a [June 2020 paper](https://academic.oup.com/intqhc/advance-article/doi/10.1093/intqhc/mzaa069/5863166); read the Introduction, Discussion and Conclusion sections for concepts. For technical details of the display, read this [document](https://github.com/klittle314/IHI_Covid_Public/tree/2eb2c6de1fbb13e0cef74bf2a7f28b70a099aa1e.).
* ​​**Scroll Up/Down on Page:** Use the gray vertical scroll bar on the far right to scroll up and down on a particular page.​
* **View ​Full Screen:** Use the Full Screen mode (click arrow icon, bottom right) to see the dashboard in a full browser window.

​Raw or Adjusted Data?

The displays offer a choice between the raw data obtained from the source web pages or adjusted data. The adjusted data attempts to account for strong day of the week effects observed for many series. Click [here](https://github.com/klittle314/IHI_Covid_Public" \l "adjusting) for an explanation of the adjustment used in the display.

Global Data: COVID-19 Reported Deaths by Country

**Select Country:** On the far left of the dashboard, click ​the circle to the left of the country name. (Use Full Screen mode to view larger.)

[embedded data/SPC charts]

United States Data: COVID-19 Reported Deaths by US ​State and ​Territory

**Scroll Through Pages:** Use the left/right arrows in the gray area at the bottom of the dashboard to scroll through pages.   
​(Or click on the numbered page range to jump to a specific page.)​

​ ​[embedded data/SPC charts]

Create a Customized Control Chart

Use the [COVID-19 Control Chart Application](https://iecodesign.shinyapps.io/Hybrid_Shewhart_chart_COVID/) to create a customized control chart with your own local data.

If you know how to read and apply R, you can [access the R code on the GitHub website](https://github.com/klittle314/IHI_Covid_Public" \o "GitHub code for COVID-19 Reported Deaths control charts" \t "_blank) that drives the IHI Covid data control charts.

​Data Sources

The dashboard uses COVID-19 data from the [New York Times GitHub site](https://github.com/nytimes/covid-19-data) and from the [Our World in Data site​](https://ourworldindata.org/coronavirus-source-data).

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