

COVID-19 cases, deaths may follow weekly pattern

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MIT, Boston University, and Harvard Medical School researchers have identified weekly oscillations in the numbers of new daily COVID-19 cases and deaths in several countries that are more pronounced than fluctuations seen with other diseases.

In their research letter, published today in *JAMA Network Open*, the authors describe how they analyzed daily new international coronavirus case and [death](#) data from the Worldometer for the United States, Germany, Canada, Italy, Brazil, and the United Kingdom from Feb 29 to Jul 2.

In Germany and Italy, oscillations of new infections and deaths became less pronounced over time, with a 92% reduction from peak to peak in daily reported deaths from April to July, which the authors said could indicate significantly slower [disease](#) transmission. But the United States and Brazil showed only a 43% reduction in U.S. peak-to-peak oscillations in deaths during the same period, indicating that those countries have not significantly slowed transmission rates.

In the United States, the lag time between daily new cases and deaths was two days, compared with one day for Germany. But the authors said that the lag was not caused by epidemiologic factors but rather by possible bias in the disease surveillance system.

Regular oscillations in other epidemics

The authors said that the periodic oscillations in daily reported cases could have been caused by testing bias (higher testing rates on certain days of the week) but that they also saw periodic oscillations in positive testing rates, which means that other variables such as epidemiologic or social factors might be behind the observed weekly fluctuations.

The researchers noted that previous epidemics involving other [infectious agents](#) have shown periodic oscillations, but not such high-frequency ones. Seasonal oscillations have been observed in smallpox in Japan, India and Sweden, and [dengue fever](#) in Thailand, which suggests that immune interactions between serotypes could play a role.

Previous studies have also noted weekly oscillations in new COVID-19 cases and deaths around the world. One such report, which was not peer-reviewed, suggested that the weekly pattern was due to less intergenerational physical distancing being observed over weekends, while a peer-reviewed report concluded that weekly variations were caused by testing and reporting fluctuations.

The weekly oscillations should be taken into account in the estimation of COVID-19 disease spread, similar to the way experts account for seasonality in flu, the authors of the current study said. "We urge the [scientific community](#) to conduct an in-depth exploration of the periodicity in COVID-19 cases and deaths, which might lead to improved COVID-19 predictions and understanding of the transmission of the disease," they wrote.

More information: Qasim Bukhari et al. Periodic Oscillations in Daily Reported Infections and Deaths for Coronavirus Disease 2019, *JAMA Network Open* (2020). [DOI: 10.1001/jamanetworkopen.2020.17521](https://doi.org/10.1001/jamanetworkopen.2020.17521)

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