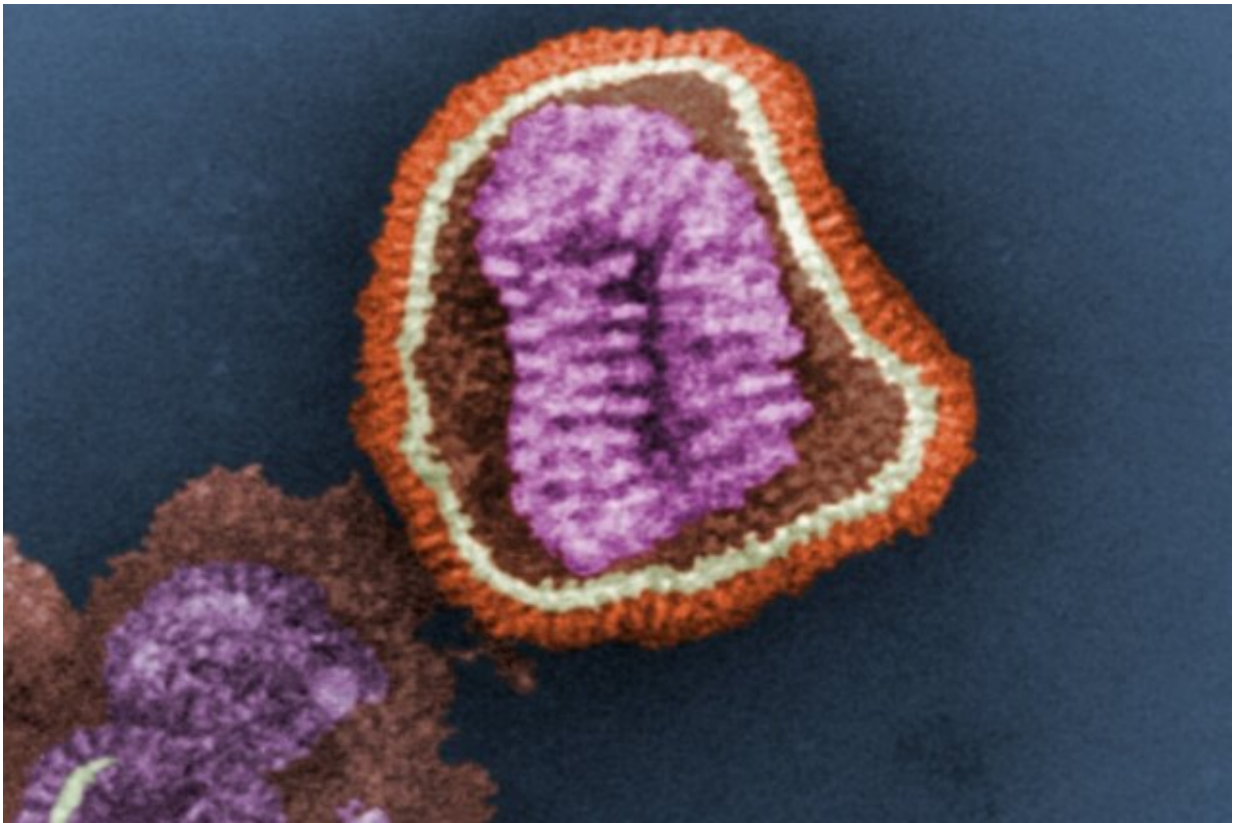


Sharp flu rebound expected after lifting of COVID distancing measures

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This digitally-colored transmission electron microscopic image depicts the ultrastructural details of an influenza virus particle. Credit: CDC, Frederick Murphy

New research warns that the United States could experience a severe

influenza outbreak after public health measures like face masks and social distancing are lifted. These measures have protected people from COVID-19 and influenza—incidence of influenza declined 60 percent during the first ten weeks following the implementation of the measures—but is also leading to greater numbers of Americans susceptible to the flu as immunity to the virus wanes.

The findings by researchers at Columbia University Mailman School of Public Health are published in the *Journal of Infectious Diseases*.

The use of public health measures like face masks and social distancing has declined substantially since the 2020/2021 flu seasons, although not yet to pre-pandemic levels. To what extent the flu might reassert itself in the U.S. this winter likely hinges on how much these behaviors continue.

"In the short term, measures to control the spread of the coronavirus will likely continue to suppress the number of influenza infections, but after these measures are relaxed, with greater population-wide immune susceptibility to influenza could lead to a large [outbreak](#)," says senior author Sen Pei, Ph.D., assistant professor of environmental health sciences. "This year, it's more important than ever to get your flu shot. While we're rightly focused on protecting ourselves against COVID-19, we shouldn't forget about the flu, which can be fatal."

Pei and colleagues used a computer model of influenza A/H1 and B, which circulated in early 2020, to quantify the reduction of incidence and transmission after the implementation of non-pharmaceutical interventions (NPI) in most states on March 15, 2020. NPIs include travel restrictions, [face masks](#), social distancing, public education on prevention measures, and school closures. They also projected influenza transmission at the national scale over the next five years. The model used data from the CDC FluView website.

A Large Outbreak Followed by Years of Severe Flu Seasons

According to the model's projections, as public health measures are relaxed, a large-scale influenza outbreak will likely take place. In subsequent seasons, outbreaks will also be elevated, gradually return to pre-pandemic levels. Over the last decade, U.S. influenza deaths ranged from 12,000 in 2011-12 to 61,000 in 2017-2018. "Our projections show that the downstream, ripple-effects of pandemic public health measures could persist for a number of years," says Pei

How Bad Could the Flu Outbreak Be?

It could be really bad.

The longer the control measures are in place before they are lifted, the greater the number of individuals who will be susceptible to an influenza infection—a situation that could lead to a more severe outbreak in parts of the country that had high levels of adherence to masking and other public health measures during the pandemic. Additionally, the researchers anticipate that the global suppression of influenza activity during the pandemic may make it difficult to predict future circulating strains to inform the production of influenza vaccines. As a result, vaccine effectiveness might be reduced. Furthermore, suppression of influenza during the pandemic could lead to a surge of multiple influenza strains, including the A/H3 strain which has a high mortality rate and hasn't been widely circulating since the 2018-2019 season. All these factors would contribute to a more severe outbreak.

Or maybe not.

The suppression of influenza during the 10-week study period could be

overstated in the data due to people's reluctance to seek medical care for non-emergencies during the pandemic. Another question is whether or not antigenic escape (viral mutations that allow it to evade the immune system) rather than waning immunity is the predominant mechanism in the accumulation of population susceptibility to influenza. If so, influenza would have less opportunity to mutate while public health measures are in place. A more durable influenza immunity would also result in fewer people being susceptible to influenza when [public health measures](#) are lifted. All these possibilities would contribute to a less severe outbreak.

Regional Variation in 2020 Influenza Activity

During the study period, changes in Influenza A activity varied by [public health](#) region, from a reduction of 68 percent in Region 3 (Delaware, Pennsylvania, Virginia, West Virginia, and Washington, D.C.) to 88 percent in Region 5 (Illinois, Indiana, Michigan, Minnesota, Ohio). Influenza B activity ranged from 32 percent in Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont) to 91 percent in Region 7 (Iowa, Kansas, Missouri, Nebraska). Unusually, Region 2 (New Jersey, New York, Puerto Rico, and the Virgin Islands) saw an increase in influenza incidence—an outcome the authors attribute to elevated medical visits early on in the pandemic that detected [influenza](#) cases that would have otherwise gone undetected. Due to this bias, the authors excluded Region 2 from their projections.

More information: Yuchen Qi et al, Quantifying the impact of COVID-19 non-pharmaceutical interventions on influenza transmission in the United States, *The Journal of Infectious Diseases* (2021). [DOI: 10.1093/infdis/jiab485](https://doi.org/10.1093/infdis/jiab485)

Provided by Columbia University's Mailman School of Public Health

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