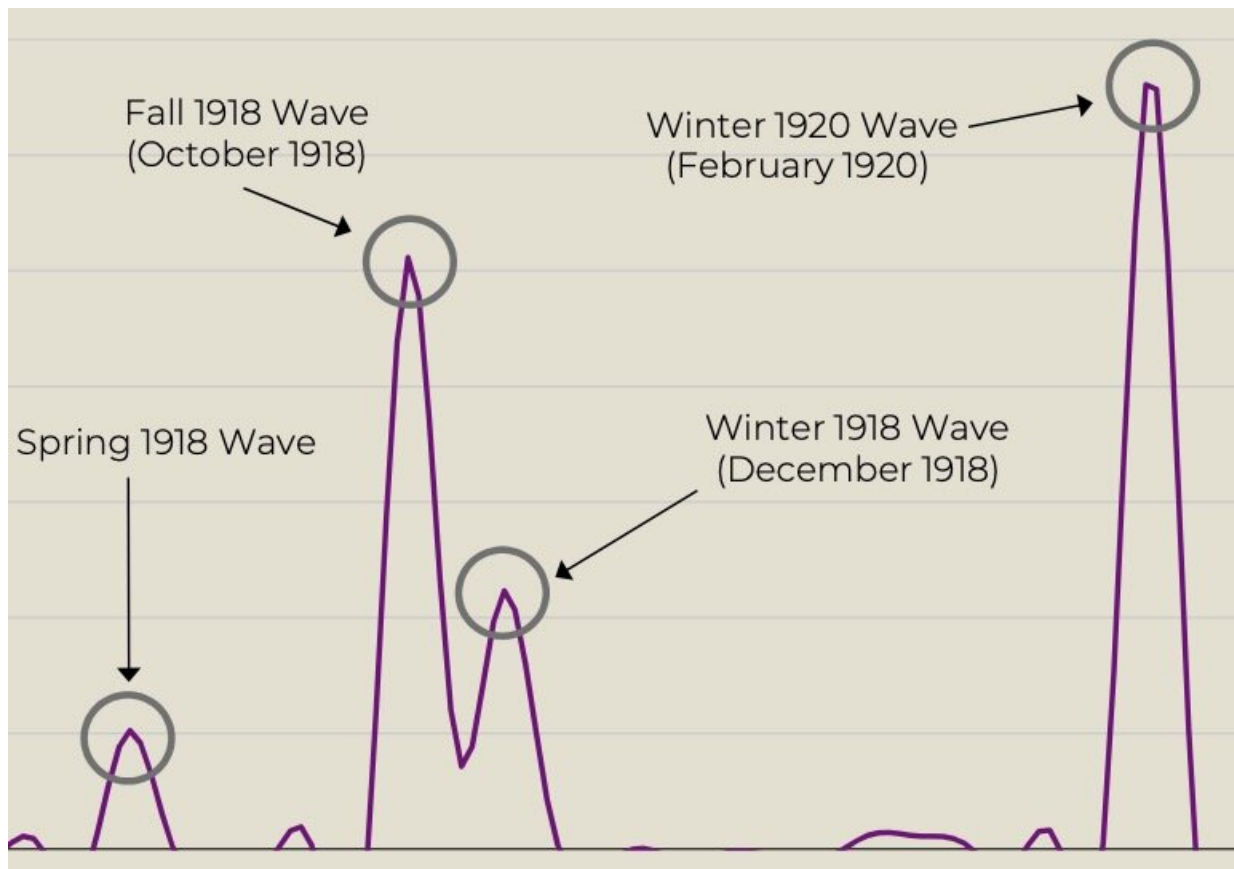


Caution: 1918 influenza provides warning for potential future pandemic reemergence

February 11 2021, by Emilie Lorditch



This graph shows the four distinct waves. Wave #1 March 1918 (Spring 1918 Wave), #2 October 1918 (Fall 1918 Wave), #3 December 1918 (Winter 1918 Wave) and #4 February 2020 (Winter 1920 Wave). Credit: Siddarth Chandra

The 1918 influenza pandemic provides a cautionary tale for what the

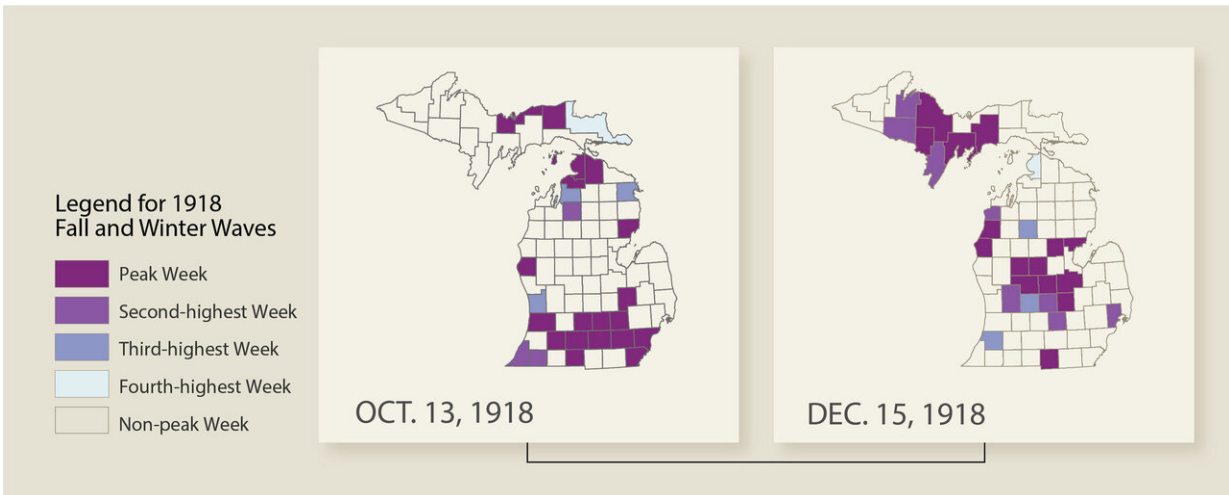
future may hold for COVID-19, says a Michigan State University researcher.

After a decade studying a flu virus that killed approximately 15,000 Michigan residents, Siddharth Chandra, a professor in MSU's James Madison College, saw his research come to life as he watched the spread of the COVID-19 pandemic.

"It was so surreal," said Chandra, who has a courtesy appointment in epidemiology and biostatistics. "All of a sudden, I was living my research."

Chandra's research is published in the *American Journal of Public Health* with co-authors Julia Christensen, a graduate of James Madison College; Madhur Chandra, Senior Community Epidemiologist with the Ingham County Health Department and graduate of the Department of Epidemiology and Biostatistics at MSU; and Nigel Paneth, professor of epidemiology and biostatistics and pediatrics at MSU.

Using influenza infection and [mortality data](#) on Michigan from 1918-1920, Chandra identified four distinct waves. The first large peak was in March 1918. "After a second spike in cases in October 1918, the governor instituted a statewide ban on public gatherings," Chandra said. "Much like the restrictions that were put in place during the COVID-19 pandemic."



This map shows the counties in Michigan with the highest numbers of flu cases during the spike and peak in cases for October and December 1918. Credit: Michigan State University

After three weeks, the number of cases decreased and the ban was lifted, which led to another peak in December 1918. "The ban didn't stop the spread of the flu. It just delayed the spike in cases," he said.

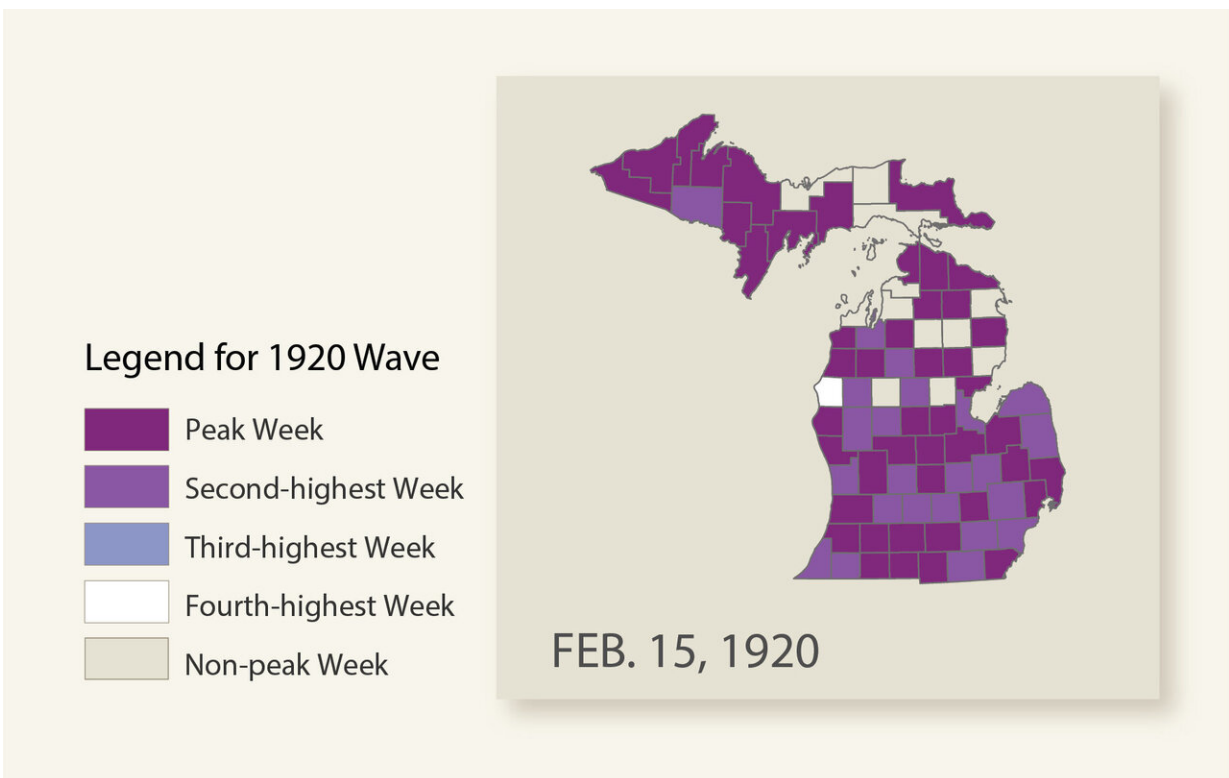
Chandra mapped the data showing the peaks and spikes in cases from October 1918 and December 1918 and tracked [flu virus](#) case growth by county over time. In October, counties in the southern part of the state and near the Mackinac Straits had the highest numbers but by December, the highest numbers of cases were in the heart of the state.

The most surprising piece of data came 18 months later in February 1920, when a statewide explosion of cases created a massive spike even larger than the one in October 1918. For Chandra, it is an educated guess as to the reasons for this delayed increase.

"Assuming it's the same [influenza virus](#), World War I ended in 1918 and

the men were coming home to their families," he said. "We had a mobile agent that brought the virus home to infect family members, which would explain the increase in cases among children and the elderly."

Unfortunately, there is not a way to confirm this, Chandra noted. "We would need samples from patients in 1920 from across the state. Then, we would need to compare those with samples from patients in 1918 from across the state, and that's not likely to happen."



This map shows the counties in Michigan with the highest number of flu cases during the spike in cases in February 1920. Credit: Michigan State University

The weather may have also been a factor since cool temperatures with

low humidity likely provided optimal conditions for the virus to live and spread. Another factor that played a role was the absence of a vaccine.

"In 1918, there was no hope for a vaccine. In 2021, we have a vaccine available," he said.

One of the key insights from the 1918 pandemic that can inform the public health response to the 2020 COVID-19 pandemic is the number of people who are susceptible to the virus. Which means that it is possible that a spike like the February 1920 one will occur in late 2021 or early 2022.

"So many people will remain susceptible until they get vaccinated," Chandra said. "Bad things can still happen a year or two from now even if we see a decrease in the number of cases now. We still have over 200 million people walking around who are susceptible to the [virus](#), including myself."

More information: Siddharth Chandra et al. Pandemic Reemergence and Four Waves of Excess Mortality Coinciding With the 1918 Influenza Pandemic in Michigan: Insights for COVID-19, *American Journal of Public Health* (2021). [DOI: 10.2105/AJPH.2020.305969](https://doi.org/10.2105/AJPH.2020.305969)

Provided by Michigan State University

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