

## PUBLIC HEALTH

# COVID-19 measures also suppress flu—for now

In downside, trend could weaken immunity and complicate vaccine formulation

By Kelly Servick

Influenza forecasters are a cautious bunch. Flu cases can spike in late winter after months of low infection rates, making experts reluctant to predict a mild season too soon. But many are ready to declare that COVID-19 control measures have dramatically tamped down the flu and other respiratory viruses that would normally be ripping through the Northern Hemisphere.

The World Health Organization (WHO), based on global surveillance data collected through late last month, says flu activity in the Northern Hemisphere is at “interseasonal levels,” meaning it’s as low as in an ordinary summer. In the United States, the percentage of outpatient visits for influenzalike illness is at 1.6%, well below the 2.6% baseline used to define a seasonal epidemic. U.S. clinical labs have collected 925 positive samples since the end of September 2020, versus 63,975 at this point in the 2019–20 flu season.

“I’d be very surprised if we have a typical flu season now,” says John McCauley, a virologist who directs the Worldwide Influenza Centre at the Francis Crick Institute in London. “To see nothing so far, it’s difficult to see how it’s going to come up in large numbers in January.”

For now, that’s a relief. Fearing a flu surge on top of the pandemic, many European countries ramped up fall immunization campaigns, says Cornelia Adlhoch, an epidemiologist at the European Centre for Disease Prevention and Control. In the United States,

the Centers for Disease Control and Prevention reported record flu vaccine distribution; surveys showed adult vaccination climbed from 42% in 2019 to 53% in 2020.

“But I don’t think it’s the vaccine” that accounts for the mercifully light flu season, McCauley says. Instead, he and others point to COVID-19 measures such as mask wearing, social distancing, and travel restrictions. As in the Southern Hemisphere early last year (*Science*, 21 August 2020, p. 890), efforts that failed to fully control SARS-CoV-2 have brought less infectious seasonal viruses to heel—including influenza and respiratory syncytial virus (RSV), which causes serious illness in infants and the elderly.

For virologist Trevor Bedford of the University of Washington, Seattle, the unusual flu season means a challenge. His team analyzes flu virus genomes collected by WHO’s surveillance network to identify emerging strains, which the next year’s flu vaccine will have to protect against. “Generally, we have thousands of viruses to look at, and it’s still challenging,” he says. This season, just 127 sequences were collected between 1 September 2020 and 1 January 2021, versus 12,218 in that period the year before.

Many are a genetic variant of a flu virus that recently emerged in Cambodia, Bangladesh, and India and has caused a small seasonal outbreak, Bedford says. “That’s the strain I suspect would be the one we’d pick [as a component of] the vaccine if we had to pick it today.” WHO will convene a group in February to decide on the composition of the

next vaccine for the Northern Hemisphere.

Natural immunity to flu might suffer from this anomalous season. Fewer infections one season can lead to a larger susceptible population and a bigger outbreak the next. “We saw cases go down, and as disease modelers, we knew ... there might be a bit of a twist,” says Rachel Baker, an epidemiologist at Princeton University. In a November 2020 study in the *Proceedings of the National Academy of Sciences*, Baker and colleagues simulated future flu and RSV outbreaks in more than 300 U.S. counties and Mexican states assuming a 20% reduction in transmission of those viruses this year. For some locations, their model predicted outbreaks in the winter of 2021–22 that were double the size of typical years’.

More susceptibility could also lead to outbreaks outside peak virus season, Baker says. She suspects that’s happening in Australia: After unusually low rates of RSV in the Southern Hemisphere’s winter, the country began to lift lockdowns. Some Australian states documented a spike in October 2020, as summer approached, and continue to report above-average levels.

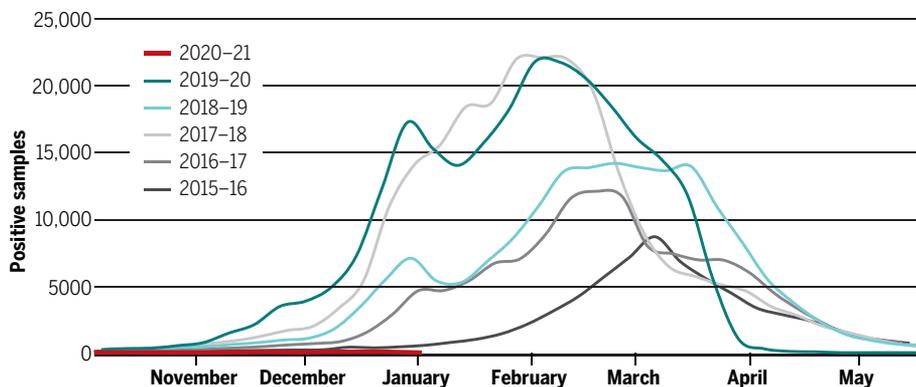
Flu outbreaks are less predictable, however, and might not rebound in the same way, Baker says; in her team’s model, suppressing flu transmission one season didn’t consistently boost incidence in the next. And if worries about a spike next year inspire more flu shots, “a larger outbreak might be thwarted,” she says.

Bedford says a less welcome development might also mitigate a flu surge next year: a revival of COVID-19 and a reinstatement of any loosened control measures. “If we don’t get enough people vaccinated over the course of the summer, mainly [because of] vaccine hesitancy,” he says, “we’ll get some smaller wave of COVID.”

But even as the threat of COVID-19 subsides in future winters, mitigation measures might linger, says Benjamin Singer, a pulmonary and critical care physician at Northwestern University. “As we start thinking about the balance of all respiratory viruses—COVID, plus flu, plus the others—are we in the United States and in the West going to start thinking more about wearing masks in public in winter months?” he wonders. “It’s an interesting sociologic kind of question: how our behavior will be impacted by our experience with COVID.” ■

## Flu away

The number of influenza-positive samples reported by U.S. clinical laboratories remains low in 2020–21 compared with past years, even though labs are testing tens of thousands of samples per week.



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