About Flu Forecasting

Influenza (flu) places a significant disease burden on the U.S. population each year, but the magnitude and timing varies from season to season, making the annual impact uncertain at the beginning of each season. Flu forecasting can change that by predicting in advance when and where increases in flu activity will occur. Unlike CDC's traditional influenza surveillance systems, which measure flu activity while it is occurring, flu forecasting offers the possibility of looking into the future and better planning ahead, potentially reducing the impact of flu.

What is Flu Forecasting?

CDC's efforts with forecasting began in 2013 with the "Predict the Influenza Season Challenge", a competition that encouraged outside academic and private industry researchers to forecast the 2013–14 flu season. Each flu season after, CDC's Influenza Division collaborated with external researchers on flu forecasting. CDC has provided forecasting teams data, relevant public health forecasting targets, and forecast accuracy metrics while teams submit their forecasts, which are based on a variety of methods and data sources, each week. CDC did not provide flu forecasts during the 2020-2021 flu season because there was too little flu activity to produce stable forecasts.

For the 2021-2022 flu season, forecasts will be made for flu-related hospitalizations, using data from HHS Protect ⧉ . This change was made because the data from this system can provide a more complete picture of the number of flu hospitalizations in the U.S. In past seasons, hospitalization forecasts were based on FluSurv-NET data, which only includes a subset of flu hospitalizations in the U.S.

How can flu forecasts be used prior to and during outbreaks?

The potential uses of flu forecasts extend beyond communication, both in seasonal and emergency situations. Flu forecasts can be used to prepare for and help prevent illness, hospitalization, and death, as well as the economic burden, experienced during a flu season. When forecasts accurately predict flu activity, more effective planning of public health responses to seasonal flu epidemics and future flu pandemics is possible. Flu forecasts can inform messaging to health care providers regarding:

- flu vaccination and antiviral treatment timing for patients,
- preparation for an influx of hospitalizations,
- informing the distribution and placement of health care staff and treatment resources and,
- guiding community mitigation strategies, such as temporary school closures.

Collaborating to Understand and Improve Forecasts

While significant progress has been made in the years following the initial competition, forecasting flu remains challenging. Flu viruses are constantly changing, and every flu season tends to be different from the one before it. CDC and participating teams collaborate to identify the best data, methods, and practices for forecasting in order to support the advancement of the science of flu forecasting, improving its ability to inform future public health action. These collaborations are critical to developing a network of forecasters providing results that public health officials can use to guide their work. Examples of these collaborations include Carnegie Mellon University and University at Massachusetts Amherst, which were awarded funding in 2019 to further improve the accuracy and communication of flu forecasts at the national, and state level.

CDC, FluSight partners, and stakeholders also gather at the end of every forecasting season to review forecasting approaches, discuss the accuracy of forecasts from the past season, identity overall challenges and successes and plans for future seasons, such as the additions of new forecasting targets. These meetings improve the usefulness of forecasting by providing the opportunity for collaboration among forecasters and public health officials.