Maine Influenza Surveillance Overview

2024-2025 Influenza Season

Synopsis

The purpose of the Maine Weekly Influenza Surveillance Report is to summarize influenza surveillance information that characterizes the incidence and burden of influenza and influenza-like illness in Maine. Weekly reports are published each Tuesday during influenza surveillance season on Maine Center for Disease Control and Prevention's (Maine CDC) influenza website (http://www.maineflu.gov). You can sign up to automatically receive the weekly influenza reports via email at https://public.govdelivery.com/accounts/MEHHS/subscriber/new?preferences=true.

Influenza is a viral illness that typically occurs during the winter months. Characterized by the abrupt onset of constitutional and respiratory signs and symptoms, such as fever, muscle aches, headache, severe malaise, non-productive cough, sore throat, and runny nose, influenza is spread from person to person primarily through the coughing and sneezing of infected persons. Influenza can be diagnosed through laboratory testing.

Influenza-like illness (ILI) is a term used to describe illness that presents with the typical signs and symptoms of influenza, but that has not been confirmed by laboratory test. ILI is defined as fever greater than or equal to 100°F (37.8°C) AND cough and/or sore throat. Monitoring the frequency at which Maine residents present for medical care due to ILI may indicate the rate of new infection and burden of disease.

U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet)

Each week a network of volunteer outpatient providers, including clinics, student health centers, and emergency departments, report the percentage of patient visits with influenza-like illness (ILI), which consists of cough and/or sore throat and a fever ≥100ºF. These outpatient ILI data are collected through the U.S. Outpatient Influenza-Like Illness Surveillance Network (ILINet), a collaborative effort between the US Centers for Disease Control and Prevention (US CDC), state health departments, and local health care providers. During the 2024-25 season, 51 providers in Maine are enrolled and will report the total number of patient visits and the number of those patients seen for ILI by age group (0-4, 5-24, 25-49, 50-64, ≥65) on a weekly basis. These data are reported on the weekly surveillance report as an unweighted percentage (# patients with ILI / total # patient visits). Since ILINet monitors visits for ILI and not laboratory-confirmed influenza, it will capture visits due to any respiratory pathogen that presents with ILI symptoms. These data should be evaluated in the context of other surveillance data to obtain a complete and accurate picture of influenza virus activity.

Syndromic Surveillance

Emergency Room Visits:

All hospitals in Maine (except Togus VA Hospital) report to Maine CDC "de-identified" information (does not include names, street addresses, social security numbers) about every visit to their emergency room (ER). Maine CDC uses a computer algorithm to search the text of these reports and categorize ER visits into syndromes. For example, an ER visit might have a chief complaint that reads "cough and fever" or a diagnosis code that indicates influenza. The algorithm finds that this visit aligns with the influenza-like illness syndrome and categorizes this visit under influenza-like illness and general respiratory illness. It adds up the number of visits in this category or syndrome into daily tallies and graphs. Over time, these graphs show trends in influenza-like illness ER visits.

Emergency Medical Services (EMS):

All ambulance providers in Maine submit Patient Care Reports (PCRs) in near real-time to Maine EMS using "Elite", a software product provided by ImageTrend. Maine CDC uses a computer algorithm to search the text of these reports. For example, a PCR might show clinical impressions or patient symptoms like fever, cough, and sore throat, or more explicitly indicative text like "flu" or "influenza". The algorithm finds that this PCR has influenza-like illness and respiratory illness symptoms, and categorizes this patient under influenza-like illness and general respiratory illness. It adds up the number of patients in this category or syndrome into daily tallies and graphs. Over time, these graphs show trends or "spikes" of influenza-like illness is people utilizing EMS.

Hospitalizations
Influenza-associated hospitalizations are required to be reported to Maine CDC. Hospitals report patients who are hospitalized due to infection with laboratory-confirmed influenza.

Pneumonia and Influenza (P&I) Deaths
Maine's Electronic Death Registry System (EDRS) is used to determine the number of death certificates in which pneumonia and/or influenza are listed as a cause of death, as well as the total number of deaths by week. These data are used to calculate the percentage of deaths attributable to pneumonia and/or influenza (P&I) by week of death and are reported as unweighted percentages (# deaths attributed to influenza and pneumonia / total number of deaths). Influenza-related deaths are often a result of pneumonia and calculating influenza and pneumonia deaths together provide a more complete understanding of the true impact of influenza on mortality.

Influenza-Associated Deaths
Influenza-associated deaths, or deaths with influenza listed on the death certificate, are determined through Maine's Electronic Death Registry System (EDRS). This is likely an under representation of the true mortality due to influenza.

Pediatric Influenza-Associated Deaths
Deaths associated with laboratory-confirmed influenza in persons less than 18 years old are required to be reported to Maine CDC. Each report is investigated to obtain additional demographic and clinical information.

Maine Health and Environmental Testing Laboratory
Maine's Health and Environmental Testing Laboratory (HETL) works collaboratively with hospitals and clinical laboratories to collect specimens for respiratory virus testing and influenza subtyping year-round. This testing is important in identifying the circulating influenza viruses and to confirm specimens that tested positive by rapid test.

Reference Laboratories
One large reference laboratory in Maine reports the total number of positive influenza specimens that are laboratory-confirmed by culture or reverse-transcriptase polymerase chain reaction (RT-PCR) as well as the total number of tested specimens. These data are reported through The National Respiratory and Enteric Virus Surveillance System (NREVSS) as percent positivity and the total number of positive specimens by influenza type.

Additional Laboratory reports
Influenza laboratory reports are not required to be reported to Maine CDC; therefore, the number of positive test results does not reflect the total amount of influenza in Maine. However, laboratory data do provide information about the types of influenza viruses circulating in Maine and help indicate the presence and define the distribution of influenza in the state.

Antigenic Characterization
US CDC antigenically characterizes about 2,000 influenza viruses during a typical influenza season to monitor for changes in circulating viruses and to compare how similar these viruses are to those included in vaccines. Antigenic characterization can give an indication of the influenza vaccine's ability to produce an immune response against the influenza viruses circulating in people. This information also helps experts decide what viruses should be included in the upcoming season's influenza vaccine.

County-level Severity Estimates
Severity is estimated using county-level pneumonia & influenza deaths, percent of emergency department visits due to ILI, and influenza-related hospitalizations. Thresholds are calculated statewide from previous seasons' data using the moving epidemic method, as described at https://www.cdc.gov/flu/about/classifies-flu-severity.htm. Levels of severity include low, moderate, high, and very high.

County-level Activity Trend

Trends are classified based on whether the percentage of emergency room visits due to ILI show statistically significant slopes ($p < 0.05$) in linear regressions. A trend is classified as increasing if the slope is statistically significantly positive or decreasing if the slope is statistically significantly negative. A trend is considered sustained ("sustained increase" or "sustained decrease") if it is significantly significant over a 4-week period. If a sustained trend is not found, shorter term trends ("increase" or "decrease") are evaluated based on the 2 most recent weeks. If no statistically significant trend is found over either duration, the trend is classified as "plateau". Trend regressions use date as the independent variable.

Outbreaks

Outbreaks of influenza or ILI are required to be reported to Maine CDC. The definition used to recognize outbreaks of ILI varies by setting.

Long-term care facility outbreak:
When at least 2 residents are ill with ILI within 72 hours of each other and at least one person in the facility (resident or staff) has laboratory-confirmed influenza (by any method) OR when at least 2 residents are ill with ILI and there is no other known cause.

Acute care facility nosocomial outbreak:
One or more patients with laboratory-confirmed influenza with symptom onset greater than or equal to 48 hours post-admission.

School (K-12) or daycare outbreak:
Greater than or equal to 15% absenteeism among students where the majority of those absent report respiratory symptoms and no other etiology has been identified.

Other Institutions (workplaces, correctional facilities, summer camps, universities, etc.):
A sudden increase of influenza-like illnesses over the normal background rate in the population.

National Influenza Activity

The US CDC determined activity levels are based on the percent of outpatient visits due to ILI in a jurisdiction compared with the average percent of ILI visits that occur during weeks with little or no influenza virus circulation (non-influenza weeks) in that jurisdiction. The number of sites reporting each week is variable; therefore, baselines are adjusted each week based on which sites within each jurisdiction provide data. To perform this adjustment, provider level baseline ILI ratios are calculated for those that have a sufficient reporting history. Providers that do not have the required reporting history to calculate a provider-specific baseline are assigned the baseline ratio for their practice type. The jurisdiction level baseline is then calculated using a weighted sum of the baseline ratios for each contributing provider.

Influenza surveillance considerations

- The reported information helps answer the questions of where, when, and what influenza viruses are circulating. It can be used to determine if influenza activity is increasing or decreasing but it does not directly provide the number of influenza illnesses in Maine.
- Influenza surveillance data are aggregated according to the week the event (e.g., positive laboratory test, outpatient visits, death) occurred. The week starts on Sunday and ends on the following Saturday.
- The reporting period for each influenza season begins during *Morbidity and Mortality Weekly Report* (MMWR) week 40 and ends week 39 of the following year. MMWR Weeks refer to the sequential numbering of weeks (Sunday through Saturday) during a calendar year. This means that the exact start of the new influenza surveillance season varies slightly from season to season. The 2024-2025 influenza season begins September 29, 2024 and ends on September 27, 2025.