2018-2019 Influenza Season, Boston

Communicable Disease Control Division
Infectious Disease Bureau

Boston Public Health Commission
Influenza Surveillance, Boston, 2018-2019

- Confirmed cases represent persons who seek health care and test positive for influenza.
- BPHC syndromic surveillance data are used to track influenza-like illness (ILI) visits at Emergency Departments (EDs) in Boston.
- The %ILI represents the percent of all ED visits attributed to ILI based on chief complaint data.
- During the season, data are used to inform control measures and provide community and stakeholder situational awareness.
- Data for this report were analyzed by BPHC at the conclusion of the influenza season.
Boston ED ILI data tracks well with laboratory-confirmed reports of influenza. This season, flu activity in Boston was characterized by a bimodal peak in activity (based on two metrics of activity: influenza-like-illness [%ILI] and confirmed case counts). The 2018-19 season was a primarily A(H1N1) predominant season. The last A(H1N1) predominant season was 2015-16. National flu subtyping data identified a wave of A(H3N2) activity that followed the initial peak of flu activity in February. A(H3N2) eventually superseded A(H1N1) as the predominant circulating strain as the 2018-19 season progressed. This, along with increased flu B activity, may have contributed to the second wave of overall flu activity. This reinforces the need for continual monitoring of flu activity even when activity appears to have subsided. A seemingly clear downward trend in activity is not always indicative that flu activity has resolved.
This season, influenza activity in Boston was characterized by a bimodal peak (based on two metrics: influenza-like-illness (ILI)% and confirmed case counts). The 2018-19 season was initially an A(H1N1)-predominant season and A(H3N2) became the predominant A type after February. The proportion of total cases due to influenza B increased as the season progresses which is consistent with what typically occurs during most influenza seasons. The less pronounced increase in emergency department ILI associated visits was likely due to visits to other sites such as clinic and urgent care centers. Co-circulation of a variety of influenza viruses reinforces the need for vaccination as the primary prevention strategy as seasonal influenza vaccine covers multiple strains of influenza viruses.
The 2018-19 season was the longest flu season in 10 years, with national ILI at or above baseline for 21 weeks. Boston ED %ILI peaked the week ending 2/9/2019 at 2.82%, almost half that of the previous season’s peak %ILI of 5.23%. The CDC has categorized the 2018-19 season as moderate.
Persons hospitalized with influenza had a higher mortality rate (1.02%). Among non-hospitalized cases, the mortality rate was 0.03%. No pediatric influenza-associated deaths were identified in Boston residents.

*Only pediatric influenza-related deaths are nationally reportable. Through death certificate review and voluntary reporting by healthcare facilities, BPHC informally tracks influenza-related deaths among Boston residents. The numbers of deaths reported here are likely undercounts as no formal surveillance mechanism is in place to identify all Influenza-associated deaths.
For the 2018-19 season, adults 65 years of age and older accounted for 14% of confirmed influenza cases compared to 21% for the 2017-18 season. This is likely related to the predominant circulation of A(H1N1) viruses (which shifted to a predominance of A(H3N2) viruses around March) in contrast to the predominance of A(H3N2) viruses during the entirety of the 2017-18 season. Although all influenza A types disproportionally impact persons at each end of the age spectrum (especially those ≤5 and ≥ 65 years of age), A(H3N2)-predominant seasons tend to have an even greater impact on those of advanced age.
Females accounted for the majority (57%) of reported cases. This may be due to gender differences in healthcare seeking behavior and the fact that females outnumber males in Boston in the ≥65 year old age group. Persons 18 to 44 years of age accounted for the highest proportion of reported influenza cases, with females accounting for 62% of cases in that age group.
Influenza disproportionately impacts extremes of age, specifically children ≤17 years of age, and persons ≥65 years of age.

Reported Influenza Cases by Age in Boston Residents, Compared to the Overall Boston Population*, 2018-2019

*Boston Population, 2010 Census Data
Influenza disproportionately impacts Black residents, and to a lesser extent, Latino residents. This is consistent with data that BPHC has reported over the past several influenza seasons.
Influenza A vs. Influenza B Cases by Age Group, Boston Residents, 2018-2019

<table>
<thead>
<tr>
<th>Age Group (years)</th>
<th>&lt;5</th>
<th>5-17</th>
<th>18-44</th>
<th>45-64</th>
<th>65+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza A</td>
<td>77%</td>
<td>65%</td>
<td>75%</td>
<td>91%</td>
<td>91%</td>
<td>79%</td>
</tr>
<tr>
<td>Influenza B</td>
<td>23%</td>
<td>35%</td>
<td>25%</td>
<td>9%</td>
<td>9%</td>
<td>21%</td>
</tr>
</tbody>
</table>

N=3852

The likelihood of being diagnosed with influenza A vs. Influenza B increased with age. The overall distribution of influenza types by patient age was statistically significant (p<0.00001).
### Characteristics of Reported Influenza Cases*, by Age Range, Boston, 2018-2019

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age Group (years)</th>
<th>&lt;5</th>
<th>5-17</th>
<th>18-44</th>
<th>45-64</th>
<th>65+</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male (%)</td>
<td>N=424</td>
<td>N=581</td>
<td>N=1479</td>
<td>N=822</td>
<td>N=546</td>
<td>N=3852</td>
<td></td>
</tr>
<tr>
<td>60%</td>
<td>52%</td>
<td>38%</td>
<td>41%</td>
<td>39%</td>
<td>43%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female (%)</td>
<td>N=424</td>
<td>N=581</td>
<td>N=1479</td>
<td>N=822</td>
<td>N=546</td>
<td>N=3852</td>
<td></td>
</tr>
<tr>
<td>40%</td>
<td>48%</td>
<td>62%</td>
<td>59%</td>
<td>61%</td>
<td>57%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White (%)</td>
<td>N=424</td>
<td>N=581</td>
<td>N=1479</td>
<td>N=822</td>
<td>N=546</td>
<td>N=3852</td>
<td></td>
</tr>
<tr>
<td>20%</td>
<td>19%</td>
<td>27%</td>
<td>27%</td>
<td>40%</td>
<td>27%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black (%)</td>
<td>N=424</td>
<td>N=581</td>
<td>N=1479</td>
<td>N=822</td>
<td>N=546</td>
<td>N=3852</td>
<td></td>
</tr>
<tr>
<td>38%</td>
<td>38%</td>
<td>34%</td>
<td>41%</td>
<td>28%</td>
<td>36%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latino (%)</td>
<td>N=424</td>
<td>N=581</td>
<td>N=1479</td>
<td>N=822</td>
<td>N=546</td>
<td>N=3852</td>
<td></td>
</tr>
<tr>
<td>21%</td>
<td>25%</td>
<td>24%</td>
<td>22%</td>
<td>20%</td>
<td>23%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian (%)</td>
<td>N=424</td>
<td>N=581</td>
<td>N=1479</td>
<td>N=822</td>
<td>N=546</td>
<td>N=3852</td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>5%</td>
<td>7%</td>
<td>3%</td>
<td>6%</td>
<td>6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other** (%)</td>
<td>N=424</td>
<td>N=581</td>
<td>N=1479</td>
<td>N=822</td>
<td>N=546</td>
<td>N=3852</td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>5%</td>
<td>4%</td>
<td>2%</td>
<td>2%</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unknown (%)</td>
<td>N=424</td>
<td>N=581</td>
<td>N=1479</td>
<td>N=822</td>
<td>N=546</td>
<td>N=3852</td>
<td></td>
</tr>
<tr>
<td>11%</td>
<td>8%</td>
<td>4%</td>
<td>5%</td>
<td>4%</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitalized</td>
<td>N=424</td>
<td>N=581</td>
<td>N=1479</td>
<td>N=822</td>
<td>N=546</td>
<td>N=3852</td>
<td></td>
</tr>
<tr>
<td>9.4%</td>
<td>4.0%</td>
<td>6.6%</td>
<td>22.1%</td>
<td>44.9%</td>
<td>15.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Died***</td>
<td>(N=0)</td>
<td>(N=0)</td>
<td>(N=0)</td>
<td>(N=4)</td>
<td>(N=5)</td>
<td>(N=9)</td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0.49%</td>
<td>0.92%</td>
<td>0.23%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Reported Cases: Boston Residents only.
**Other is inclusive of American Indian, Alaskan Native, Native Hawaiian, Pacific Islander, and unspecified “other” race.

Persons ≥45 years of age had higher hospitalization and mortality rates compared to younger age groups (p=0.0001). No pediatric influenza associated deaths were reported in Boston residents during the 2018-19 season. The last pediatric influenza associated death in a Boston resident occurred in 2012.

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Over the past five influenza seasons, hospitalizations and mortality were highest during the 2014-2015 influenza season. The predominant circulating virus was influenza A(H3N2) with a demonstrated antigenic drift from vaccine strain. The 2018-2019 season, primarily an A(H1N1) predominant season with replacement by A(H3N2) beginning in March 2019, had the lowest hospitalization and mortality rate among cases seen at acute care hospitals over the past five seasons.
Confirmed Influenza Cases and ILI Emergency Department (ED) Visits, Boston Residents, 2018-2019

Confirmed Influenza Cases, per 100,000 population, 9/30/2018-5/4/2019

ILI ED Visits, per 100,000 population, 9/30/2018-5/4/2019

Legend:
- A/B = Allston/Brighton
- BB = Back Bay
- CH = Charlestown
- DOR = Dorchester
- EB = East Boston
- FW = Fenway
- HP = Hyde Park
- JP = Jamaica Plain
- MT = Mattapan
- RS = Roslindale
- RX = Roxbury
- SB = South Boston
- SE = South End
- WR = West Roxbury

Confirmed Influenza Cases per 100,000 Population:
- 0-225
- 226-450
- 451-675
- 676-900
- >900

ILI ED Visits per 100,000 Population:
- 0-150
- 151-300
- 301-450
- 451-600
- >600
While the 2018-2019 season matched well with Boston ED ILI data, the 2017-2018 influenza season’s extreme peak in Boston ED ILI percent was not well reflected in FNY data.

The public may participate by enrolling in FNY at: https://flunearyou.org/