Influenza Surveillance Update

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Advisory Committee on Immunization Practices
June 27, 2019
Influenza Positive Tests Reported to CDC by U.S. Public Health Laboratories, 2018-19 Season
Characterization of U.S. Influenza A (H1N1)pdm09 and B Viruses Collected September 30, 2018 to May 18, 2019

- All 1,251 influenza A (H1N1)pdm09 viruses tested belong to genetic group 6B.1A
  - 96.1% were well inhibited by ferret antisera against A/Michigan/45/2015
- All 203 B/Yamagata lineage viruses belong to Y3 clade
  - 100% were well inhibited by ferret antisera against B/Phuket/3073/2013
- 3 genetically and antigenically distinct B/Victoria subclades cocirculated
  - V1A (14.7%), V1A.1 (50.4%), V1A-3Del (34.9%)
  - The 2018-19 Northern Hemisphere vaccines contained a B/Colorado/6/2017-like V1A.1 virus
Characterization of U.S. Influenza A (H3N2) Viruses Collected September 30, 2018 to May 18, 2019

- Phylogenetic analysis of the HA genes of H3N2 viruses show co-circulation of multiple clades/subclades
- The proportion and geographic spread of viruses belonging to clade 3C.3a increased as the season progressed
- The 3C.3a viruses are antigenically distinguishable from the 3C.2a and 3C.2a1 viruses including the A/Singapore/INFIMH-16-0019/2016 (3C.2a1), a cell-propagated reference virus representing the A(H3N2) component of 2018-19 Northern Hemisphere influenza vaccines.
- Circulation of antigenically drifted viruses can impact vaccine effectiveness
Changing Proportion of H3 Genetic Clades/Sub-clades
Vaccine Virus Selection for 2019-20

- WHO Consultation on the Composition of Influenza Virus Vaccines for Use in the 2019-2020 Northern Hemisphere Influenza Season - February 18 – 21
  - A/Brisbane/02/2018 (H1N1)pdm09-like virus
  - A(H3N2) virus to be announced on 21 March 2019
  - B/Colorado/06/2017-like virus (B/Victoria/2/87 lineage)
  - B/Phuket/3073/2013-like virus (B/Yamagata/16/88 lineage) – quadrivalent only

- March 6, 2019: Vaccines and Related Biological Products Committee Meeting
Vaccine Virus Selection for 2019-20

- WHO and FDA Vaccines and Related Biological Products Committee Recommended Composition of Influenza Virus Vaccines for Use in the 2019-2020 Northern Hemisphere Influenza Season:
  - A/Brisbane/02/2018 (H1N1)pdm09-like virus
  - A/Kansas/14/2017 (H3N2)-like virus (3C.3a)
  - B/Colorado/06/2017-like virus (B/Victoria/2/87 lineage)
  - B/Phuket/3073/2013-like virus (B/Yamagata/16/88 lineage) – quadrivalent only
Percentage of Outpatient Visits for Influenza-like Illness, 2018-19 and Selected Previous Seasons
Influenza-Associated Mortality

Pneumonia and Influenza Mortality from the National Center for Health Statistics Mortality Surveillance System
Data through the week ending June 8, 2019, as of June 20, 2019

Number of Influenza-Associated Pediatric Deaths by Week of Death: 2015-2016 season to present

- 2015-2016: Number of Deaths Reported = 95
- 2016-2017: Number of Deaths Reported = 110
- 2017-2018: Number of Deaths Reported = 187
- 2018-2019: Number of Deaths Reported = 119

Week of Death

Deaths Reported Previous Week
Deaths Reported Current Week
Influenza Severity Assessment by Age Group, 2003-04 – 2018-19 Seasons

- Severity of the 2018-19 season classified as a moderate overall and in all age categories
- Information on how CDC classifies severity is available at https://www.cdc.gov/flu/about/classifies-flu-severity.htm

<table>
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<th>Adults</th>
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2018-19 Flu Season: Preliminary Burden Estimates

CDC estimates that, from October 1, 2018, through May 4, 2019, there have been:

- 37.4 million – 42.9 million flu illnesses
- 17.3 million – 20.1 million flu medical visits
- 531,000 – 647,000 flu hospitalizations
- 36,400 – 61,200 flu deaths

Preliminary Cumulative Estimates of Hospitalizations in the U.S. 2018–2019 Flu Season

https://www.cdc.gov/flu/about/burden/preliminary-in-season-estimates.htm
Influenza Activity in Australia

- Australia’s influenza season began earlier than typical this year
- Number of reported influenza positives similar to 2017
- Currently influenza A(H3N2) predominant
- Multiple clades detected
  - 3C.2a1b, not 3C.3a, is the predominant clade
Summary

- The severity of the 2018-19 influenza season was classified as moderate.
- The season was notable for 2 waves of influenza A viruses of similar magnitude, an influenza A(H1N1)pdm09 wave and an H3N2 wave.
- The majority of H3N2 viruses belonged to the 3C.3a genetic group which is antigenically distinct from the 3C.2a genetic group.
- The recommended H3N2 component for the 2019-20 Northern Hemisphere vaccine is an A/Kansas/14/2017-like virus, which belongs to genetic group 3C.3a.
The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.