2018-19 Influenza Season Review and 2019-20 ACIP Influenza Vaccination Update,

Lisa Grohskopf
Medical Officer
Influenza Division
Centers for Disease Control and Prevention

Current Issues in Immunization Net Conference
2 October 2019
2018-19 Influenza Season Review
A Review of Last Season (2018-19)

• Moderate severity season
  • Compared to the relatively severe 2017-18 season, influenza-related hospitalization rates lower for adults; similar for children

• Activity began increasing in November, peaked in mid-February
  • ILI above baseline for 21 weeks--longest season in 10 years

• Two waves of influenza A activity of similar magnitude (very little influenza B)
  • A(H1N1)pdm09: October 2018 to mid-February 2019
  • A(H3N2): since mid-February 2019

• Genetic diversity among H3N2 viruses; most were antigenically different from the H3N2 vaccine component
Percentage of Visits for Influenza-like Illness
Weekly National Summary, 2018-19 & Selected Previous Seasons
Influenza Positive Tests Reported to CDC by U.S. Clinical and Public Health Laboratories, 2018-19 Season

Data as of week 37, ending September 14, 2019
Laboratory-Confirmed Influenza-Associated Hospitalizations, Cumulative Rate, 2009-10 through 2018-19
Influenza-associated Mortality Surveillance

Pneumonia and Influenza Mortality from the National Center for Health Statistics Mortality Surveillance System
Data through the week ending September 7, 2019, as of September 19, 2019

Influenza-Associated Pediatric Deaths by Week of Death, 2015-2016 season to 2018-19 season

- 2016-2016: Number of Deaths Reported = 98
- 2016-2017: Number of Deaths Reported = 110
- 2017-2018: Number of Deaths Reported = 187
- 2018-2019: Number of Deaths Reported = 135

Week of Death

- Deaths Reported Previous Weeks
- Deaths Reported Current Week
Season Severity Assessment – by Age Group and Season, 2003-04 through 2018-19

<table>
<thead>
<tr>
<th>Season</th>
<th>Child</th>
<th>Adults</th>
<th>Older Adults</th>
<th>All Ages</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018–19</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>2017–18</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>2016–17</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>2015–16</td>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>2014–15</td>
<td>Moderate</td>
<td>Moderate</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>2013–14</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>2012–13</td>
<td>Moderate</td>
<td>Moderate</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>2011–12</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>2010–11</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>2009–10</td>
<td>Very High</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>2008–09</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>2007–08</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>2006–07</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>2005–06</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>2004–05</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>2003–04</td>
<td>Very High</td>
<td>Moderate</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>
Sources of 2018–19 Influenza Season Data

• Updated surveillance information is available each Friday
  • FluView, static report: https://www.cdc.gov/flu/weekly/
  • FluView Interactive, online application: https://www.cdc.gov/flu/weekly/fluviewinteractive.htm

• Vaccine effectiveness estimates
  • Morbidity and Mortality Week Report (MMWR) updates: https://www.cdc.gov/mmwr/index.html
  • Advisory Committee on Immunization Practices (ACIP) meetings: https://www.cdc.gov/vaccines/acip/meetings/index.html
2019-20 ACIP Update
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>IIV</td>
<td>Inactivated Influenza Vaccine</td>
</tr>
<tr>
<td>ccIIV</td>
<td>Cell culture based Inactivated Influenza Vaccine</td>
</tr>
<tr>
<td>aIIV</td>
<td>Adjuvanted Inactivated Influenza Vaccine</td>
</tr>
<tr>
<td>HD-IIV</td>
<td>High-Dose Inactivated Influenza Vaccine</td>
</tr>
<tr>
<td>RIV</td>
<td>Recombinant Influenza Vaccine</td>
</tr>
<tr>
<td>LAIV</td>
<td>Live Attenuated Influenza Vaccine</td>
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</table>

Numbers indicate the number of influenza virus antigens:

- 3 for trivalent: an A(H1N1), an A(H3N2), and one B (from one lineage)
- 4 for quadrivalent: an A(H1N1), an A(H3N2), and two Bs (one from each lineage)
Groups Recommended for Vaccination

• Routine annual influenza vaccination is recommended for all persons ≥6 months of age who do not have contraindications

• While vaccination is recommended for everyone in this age group, there are some for whom it is particularly important—
  • People aged ≥6 months who are at increased risk of complications and severe illness due to influenza
  • Contacts and caregivers of persons
    • <5 years of age
    • ≥50 years of age
    • with medical conditions that put them at higher risk for severe complications from influenza
Populations at Higher Risk for Severe Influenza Illness

- Children <5 years of age (especially children < 2 years of age)
- Adults aged >65 years of age
- People who have some chronic medical conditions
- People younger than 19 years of age who are receiving long-term aspirin therapy
- People who are extremely obese (BMI≥40)
- Residents of long-term care facilities
- Indigenous populations
- Pregnant women

- Chronic lung diseases (e.g. asthma, COPD, cystic fibrosis)
- Neurological and neurodevelopmental conditions
- Heart disease (e.g., CHF, coronary artery disease)
- Blood disorders (e.g., sickle cell disease)
- Endocrine disorders (e.g., diabetes mellitus)
- Kidney disorders
- Liver disorders
- Metabolic disorders
- Immunocompromising condition

http://www.cdc.gov/flu/about/disease/high_risk.htm)
## Contraindications and Precautions to Influenza Vaccination

<table>
<thead>
<tr>
<th>Vaccine Type</th>
<th>Contraindications/Populations and Situations in which Use Is Not recommended</th>
<th>Precautions</th>
</tr>
</thead>
</table>
| IIVs         | • History of severe allergic reaction to any component of the vaccine* or to a previous dose of any influenza vaccine | • Moderate or severe acute illness +/- fever  
• History of Guillain-Barré syndrome within 6 weeks after receipt of influenza vaccine |
| RiV4         | • History of severe allergic reaction to any component of the vaccine | • Moderate or severe acute illness +/- fever  
• History of Guillain-Barré syndrome within 6 weeks after receipt of influenza vaccine |
| LAIV         | • History of severe allergic reaction to any component of the vaccine* or to a previous dose of any influenza vaccine  
• Aspirin or salicylate medications in children/adolescents  
• Children aged 2 through 4 years with asthma or who have had wheezing in last 12 months (see MMWR for details)  
• Immunocompromised persons  
• Close contacts and caregivers of severely immunosuppressed persons who require a protected environment  
• Pregnancy  
• Receipt of influenza antivirals within the past 48 hours | • Moderate or severe acute illness +/- fever  
• History of Guillain-Barré syndrome within 6 weeks after receipt of influenza vaccine  
• Asthma in persons aged ≥5 years  
• Other underlying medical conditions that might predispose to complications after wild-type influenza infection (e.g., chronic pulmonary, cardiovascular [excluding isolated hypertension], renal, hepatic, neurologic, hematologic, or metabolic disorders [including diabetes mellitus]) |

*Severe allergic reaction to egg is a labeled contraindication to most IIVs and LAIV. However, ACIP recommends that persons with egg allergy of any severity receive influenza vaccine. Persons who have had allergic reactions to egg involving anything other than hives should receive the vaccine in a medical setting, supervised by a provider who is able to recognize and manage severe allergic conditions.*

Adapted from MMWR 68(RR-3), August 23, 2019, Table 2
U.S.-Licensed Influenza Vaccines, 2019-20

<table>
<thead>
<tr>
<th>Vaccine type</th>
<th>6 through 23 mos</th>
<th>2 through 3 yrs</th>
<th>4 through 17 yrs</th>
<th>18 through 49 yrs</th>
<th>50 through 64 yrs</th>
<th>≥65 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIV4s (egg)</td>
<td>Afluria Quadrivalent*</td>
<td>Fluarix Quadrivalent*</td>
<td>FluLaval Quadrivalent*</td>
<td>Fluzone Quadrivalent*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IIV4 (cell)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Flucelvax Quadrivalent</td>
</tr>
<tr>
<td>RIV4 (recombinant)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Flublok Quadrivalent</td>
</tr>
<tr>
<td>Adjuvant IIV3 (egg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fluaad</td>
</tr>
<tr>
<td>High-dose IIV3 (egg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fluzone High-dose</td>
</tr>
<tr>
<td>LAIV4 (egg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FluMist Quadrivalent</td>
</tr>
</tbody>
</table>

- * For children 6 through 35 months of age, some vaccines are dosed differently—more on this later.
- No influenza vaccines are licensed for children under 6 months of age.
- For many people in other age groups, there is more than one appropriate product.
- ACIP expresses no preference for any one influenza vaccine over another where there is more than one that is appropriate.
### HD-IIV3, aIIV3 and RIV4 for Older Adults

Summary of studies examining laboratory-confirmed influenza outcomes:

<table>
<thead>
<tr>
<th>Study Year published</th>
<th>Age</th>
<th>Season(s)</th>
<th>Comparison</th>
<th>Design</th>
<th>N</th>
<th>Relative Efficacy/effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>DiazGranados 2013</td>
<td>≥65</td>
<td>1 2009-10</td>
<td>HD-IIV3 vs SD-IIV3</td>
<td>RCT</td>
<td>~9,100</td>
<td>Not evaluable because of pandemic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>HD-IIV3 vs SD-IIV3</td>
<td>RCT</td>
<td>~32,000</td>
<td>24.2% (95% CI = 9.7–36.5)</td>
</tr>
<tr>
<td>Dunkle 2017</td>
<td>≥50</td>
<td>1 2014-15</td>
<td>RIV4 vs SD-IIV4</td>
<td>RCT</td>
<td>~8,600</td>
<td>30% (95% CI = 10–47)</td>
</tr>
<tr>
<td>Van Buynder 2013</td>
<td>≥65</td>
<td>1 2011-12</td>
<td>aIIV3 vs SD-IIV3</td>
<td>observational</td>
<td>227</td>
<td>63% (95% CI = 4–86)</td>
</tr>
</tbody>
</table>
2019-20 ACIP Influenza Statement—Updates

Principal changes and updates for 2019-20:
  • Influenza vaccine composition for 2019-20
  • Labelling changes for two existing vaccines
2019-20 Influenza Vaccine Composition

Trivalent vaccines:
- A/Brisbane/02/2018 (H1N1)pdm09–like virus—updated;
- A/Kansas/14/2017 (H3N2)–like virus—updated;
- a B/Colorado/06/2017-like virus (Victoria lineage).

Quadrivalent vaccines:
- The above three viruses, and
- a B/Phuket/3073/2013-like virus (Yamagata lineage).
Labeling Changes for Influenza Vaccines for Children 6-35 Months of Age

Afluria Quadrivalent age indication expanded from \( \geq 5 \) years to \( \geq 6 \) months
  • Dose volume 0.25mL for children 6-35 months
  • Dose volume 0.5mL for children and adults \( \geq 3 \) years

Fluzone Quadrivalent dose volume for children aged 6 through 35 months
  • Dose volume is now *either* 0.25mL or 0.5mL for children 6-35 months (was previously 0.25mL)
  • Dose volume 0.5mL for children and adults \( \geq 3 \) years
Historically, 6- through 35-month-olds received 0.25mL per dose of IIVs
- Half the 0.5mL recommended for older children and adults
- Based on early studies with whole virus vaccines showing increased fever risk

Whole-virus IIVs are no longer used in the US since ~2000-2001
- Replaced by split-virus and subunit IIVs

However, the half-dose recommendation remained

For many seasons prior to 2016-17, only IIVs licensed for this group were Fluzone/Fluzone Quadrivalent, at the 0.25mL dose
Influenza Vaccines for Children 6 through 35 months

• Four IIVs licensed for this age group for 2019-20

• Licensed dose volumes for this age group differ
  • *FluLaval Quadrivalent* (IIV4, GSK) 0.5 mL
  • *Fluarix Quadrivalent* (IIV4, GSK) 0.5mL
  • *Afluria Quadrivalent* (IIV4, Seqirus) 0.25 mL
  • *Fluzone Quadrivalent* (IIV4, Sanofi Pasteur) 0.25 mL or 0.5 mL

• Some potential for confusion regarding dose volumes

• For children who need two separate doses this season, a 0.5mL dose does not count as two doses
Number of Doses Needed Ages 6 months through 8 Years

- Children in this age group who have not had ≥2 doses of trivalent or quadrivalent vaccine before July 1, 2019 or whose vaccination history is not known need 2 doses at least 4 weeks apart for 2019-20.

- Previous doses can be from different/non-consecutive seasons.

- 8-year-olds who need 2 doses should receive second even if they turn 9 years old between dose 1 and dose 2.

*For children aged 8 years who require 2 doses of vaccine, both doses should be administered even if the child turns age 9 years between receipt of dose 1 and dose 2.*

From MMWR 68(RR-3), August 23, 2019
Timing of Vaccination

• Vaccination should be offered by the end of October
• For children 6 months through 8 years of age who need two doses, it is recommended that the first dose be given soon after vaccine is available, to allow enough time for the second dose to be received by the end of October
• For those needing only one dose, early vaccination (e.g., July or August) likely to be associated with reduced immunity later in the season, particularly for older adults
• Vaccination should continue through the season, as long as influenza is circulating and unexpired vaccine is available
Thanks!

Questions?