MDPH Influenza Update

9-27-2017
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MA Department of Public Health
Outline

• 2016-2017 Influenza Season Summary
• Influenza Immunization Rates
• 2017-2018 Influenza Vaccine Recommendations
2016-2017 Influenza Season National Summary

- Moderate season with severity indicators within range of what has been seen in H3N2 season
- Peak in February but there were regional differences
- Influenza A (H3N2) predominated worldwide and in the US
  - 2nd peak in US and MA with B strain
- Majority of circulating strains similar to those in the vaccine
- Vaccine Efficacy Overall: 42%
  - 34% A(H3N2)
  - 56%: B viruses
- Flu vaccination rates among children steady at 59%. For adults there was a 2% increase to 43%.

MMWR 2017;66:159-166, 668-676.  
FluVaxView  
www.cdc.gov/flu
Laboratory-Confirmed Influenza-Associated Hospitalizations, Cumulative, 2016-2017 and Previous 4 Seasons

Age group: Overall, Week: 17

Rates per 100,000 by Age Group

- 2016-17: 63.6
- 2015-16: 31.4
- 2014-15: 44.1
- 2013-14: 35.1
- 2012-13: 44

2016-17
Mortality Surveillance: 2016-2017 and Previous Seasons
Influenza Immunization Rates
<table>
<thead>
<tr>
<th>Group</th>
<th>MA 2015-16</th>
<th>MA 2016-17</th>
<th>US 2016-17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Everyone 6 mos+</td>
<td>50%</td>
<td>50%</td>
<td>47%</td>
</tr>
<tr>
<td>Children 6 mos – 17 yrs</td>
<td>75%</td>
<td>#3 72%</td>
<td>59%</td>
</tr>
<tr>
<td>Children 6 mos – 4 yrs</td>
<td>85%</td>
<td>82%</td>
<td>70%</td>
</tr>
<tr>
<td>Children 5 – 12 yrs</td>
<td>79%</td>
<td>71%*</td>
<td>60%</td>
</tr>
<tr>
<td>Adolescents 13 – 17 yrs</td>
<td>63%</td>
<td>#2 65%</td>
<td>49%</td>
</tr>
<tr>
<td>Adults 18 +</td>
<td>44%</td>
<td>45%</td>
<td>43%</td>
</tr>
<tr>
<td>Adults 18 – 64 y/o</td>
<td>40%</td>
<td>41%</td>
<td>38%</td>
</tr>
<tr>
<td>Adults HR 18 – 64 y/o</td>
<td>48%</td>
<td>49%</td>
<td>46%</td>
</tr>
<tr>
<td>Adults 50 – 64 y/o</td>
<td>46%</td>
<td>47%</td>
<td>45%</td>
</tr>
<tr>
<td>Adults 65+</td>
<td>60%</td>
<td>59%</td>
<td>65%</td>
</tr>
</tbody>
</table>

2015-16 and 2016-17 National Immunization Survey (NIS) and Behavioral Risk Factor Surveillance System (BRFSS)

*Statistically significant
Healthcare Provider Influenza Vaccination Rates

Annual influenza vaccination is the best method of preventing influenza and potentially serious complications. The current Healthy People 2020 goal for influenza vaccination among healthcare personnel is 90%.

The table below outlines influenza vaccination rates for different groups of healthcare workers. Vaccination rates in acute care hospitals, both nationally and in MA have surpassed the Healthy People 2020 goal and should be congratulated. However, rates for healthcare workers in general and in long term care are much lower.

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>All Healthcare Personnel</td>
<td>62%¹</td>
<td>N/A¹</td>
<td>79%</td>
<td>79%</td>
</tr>
<tr>
<td>Acute Care Hospitals</td>
<td>92%²</td>
<td>94%²</td>
<td>91%</td>
<td>92%</td>
</tr>
<tr>
<td>Nursing Homes/Long Term Care Facilities</td>
<td>73%²</td>
<td>75%²</td>
<td>69%</td>
<td>68%</td>
</tr>
</tbody>
</table>

Source: ¹ MA BRFSS ² Influenza Vaccination of Health Care Personnel in MA Nursing Homes and Acute Care Hospitals ³ CDC Health Care Personnel Influenza Survey, MMWR 2016
Mean Percent of HCP Influenza Vaccinations and Declinations as Reported by Massachusetts Clinics, Nursing Homes, Rest Homes and Adult Day Health Programs: 2012-2017 Seasons

* 2015-2016 Season was the first year Adult Day Health Programs were required to report.

MDPH 2017
Vaccine Recommendations: Key Updates for 2017-18

1) Composition of U.S. influenza Vaccines for 2017-18
2) LAIV **not** Recommended for Use During the 2017-18 Season
3) New Licensure /Approvals
4) Updated Recommendations for Influenza Vaccination of Pregnant Women

Main Flu CDC Website  
[www.cdc.gov/flu](http://www.cdc.gov/flu)
ACIP Recommendation for Influenza Vaccine the 2017-2018 Season

Recommendations published in 3 separate documents:

• 2017-2018 ACIP influenza recommendations:
  https://www.cdc.gov/mmwr/volumes/66/rr/pdfs/rr6602.pdf
  – See pages 5 and 6 for the primary changes and updates, which are not extensive this year.

New

• Summary of this year’s recommendations:
  – This 4 page ‘Job Aid’ is a new document that contains all the critical recommendations, tables and flow charts.

• Background document for this year’s recommendations:

Available at: https://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/flu.html
2017-18 Influenza Vaccine Composition

▪ **Trivalent vaccines:**
  • an A/Michigan/45/2015 (H1N1)pdm09-like virus *(NEW)*;
  • an A/Hong Kong/4801/2014 (H3N2)-like virus; and
  • a B/Brisbane/60/2008-like virus.

▪ **Quadrivalent vaccines:**
  • The above three viruses, and
  • a B/Phuket/3073/2013-like virus.
LAIV Not Recommended for 2017-18

- LAIV4 not recommended for use during the 2017-18 season
  - Recommendation extended from 2016-17 season
  - Due to concerns regarding low effectiveness against influenza A(H1N1)pdm09 viruses during 2013-14 and 2015-16
  - ACIP will consider new data concerning LAIV as it becomes available
Flublok Quadrivalent

- RIV4 (Protein Sciences)
- Licensed in October 2016 for persons aged ≥18 years, though not available until the 2017-18 season
- Hemagglutinin produced in insect cell line using a viral vector
- Egg-free
- Previous trivalent formulation of Flublok (RIV3) also expected to be available

FluLaval Quadrivalent

- Standard-dose IIV4 (GSK)
- Previously licensed for ages ≥3 years; since November 2016 licensed for ≥6 months
  - One of only two influenza vaccines approved for children 6 through 35 months of age
- Dose volume is same for all ages (0.5mL)
  - Previously 6 through 35 month-olds recommended to receive smaller doses of influenza vaccines than older persons
  - Recommendation based on increased reactogenicity of older, whole- virus vaccines
  - Split virus vaccines less reactogenic in this age group
  - FluLaval Quadrivalent 0.5mL safety comparable to 0.25mL Fluzone Quadrivalent
FluLaval Quadrivalent, cont.

**Potential for confusion**

- The one other product licensed for 6-through 35 month olds is 0.25mL Fluzone—dose volumes are **different** for this age group.
- **Dose volume** is distinct from **number of doses** needed:
  - A child aged 6 months through 8 years who needs 2 doses (because they are receiving flu vaccine for the first time, OR had a total of only 1 dose in any previous season) will need 2 doses of the appropriate dose volume for age and formulation.
  - For example, a first-time vaccinee and who gets 0.5mL FluLaval Quadrivalent for a first dose
  - *Still* needs a second dose of influenza vaccine, ≥4 weeks later. The 2 doses do not need to be the same product.
Afluria Quadrivalent

- **Standard-dose IIV4 (Seqirus)**

- **Licensed in August 2016,**
  - Initially for persons aged ≥18 years
  - Now for persons aged ≥5 years

- **Intramuscular**
  - Like Afluria (trivalent), can be administered via jet injector (the Pharmajet Stratis), but only for those aged 18 through 64 years

- **Trivalent formulation of Afluria also available this season**
  - Both Afluria and Afluria Quadrivalent are licensed for ≥5 years
Influenza Vaccination of Pregnant Women

- Influenza vaccination recommended by ACIP for women who will be pregnant during influenza season since 2004
  - Increased risk for severe influenza illness in pregnant women, particularly during second and third trimesters;
  - Influenza disease may harmful to the developing fetus and might be associated with neural tube defects, congenital heart disease and oral clefts.

- Influenza vaccine protects pregnant women and their infants during the first 6 months of life.

- Previous language stated pregnant women should receive inactivated influenza vaccine (IIV)

- 2017-18, pregnant women may receive any licensed, recommended, age-appropriate influenza vaccine (IIV or RIV), any time during pregnancy
Flu Vaccine and Miscarriage

- **Study Findings**
  - Women vaccinated with a vaccine containing the pandemic H1N1 (H1N1pdm09) component and who also had been vaccinated the prior season with that same component had an increased risk of miscarriage in the 28 days after vaccination.
  - This study does **not** quantify the risk of miscarriage and does **not** prove that flu vaccine was the cause of the miscarriage.
  - Wide confidence intervals, long history of signals of increased miscarriages that have not proved true upon completion of analysis, cases older than controls.

- **Influenza vaccines have a good safety record.**
  - Multiple studies have not found a link between flu vaccination and miscarriage.
  - There is an ongoing investigation to study this issue.
  - Results are anticipated in late 2018 or 2019.

- **CDC, ACOG and ACIP recommendations have **NOT** changed for influenza vaccination of pregnant women.**

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Donahue, G., et.al. Vaccine 2017;35:5314-5322. [http://dx.doi.org/10.1016/j.vaccine.2017.06.069](http://dx.doi.org/10.1016/j.vaccine.2017.06.069)

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**New study finds link between flu vaccine and miscarriage. But is it real?**

By Jon Cohen | Sep. 13, 2017, 1:30 PM

doi: 10.1126/science.aap9515
Study shows miscarriage risk may have increased after flu shots, puzzling researchers

By HELEN BRANSWELL @HelenBranswell / SEPTEMBER 13, 2017

… Dr. Laura Riley, an ACIP member, is not convinced the finding is real. Riley, who is vice chair of obstetrics at Massachusetts General Hospital, said she doesn’t think there’s a biologically plausible explanation for why repeated flu shots would increase the risk of miscarriage. “I remain skeptical,” she said, adding the question needs more study.

“It’s not going to change my practice, that’s for sure,” Riley told STAT. “I feel like women should be vaccinated when the vaccine becomes available and when they’re in my office. And if that’s in the first trimester, second trimester, third trimester, I’m vaccinating.”

She and other doctors will be doing a lot of that in the weeks to come. This is, after all, flu shot season in the Northern Hemisphere.

Unchanged for 2017-18

1) Many influenza Vaccine Available, But **No** Preference
2) Recommendations for Persons with Egg Allergy
3) Groups Recommended for Vaccination (See Extras)
4) Vaccination of Children 6 months through 8 years (See Extras)
### TABLE 1. Influenza vaccines — United States, 2017–18 influenza season*

<table>
<thead>
<tr>
<th>Trade name</th>
<th>Manufacturer</th>
<th>Presentation</th>
<th>Age Indication</th>
<th>Mercury from thimerosal, μg/0.5 mL</th>
<th>Latex</th>
<th>Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inactivated influenza vaccine, quadrivalent (IVQ), standard-dose¹</td>
<td>Seqirus</td>
<td>0.5 mL prefilled syringe</td>
<td>&lt;2 years</td>
<td>NR</td>
<td>No</td>
<td>IM⁵</td>
</tr>
<tr>
<td>Inactivated influenza vaccine, quadrivalent (IVQ), standard-dose¹</td>
<td>Seqirus</td>
<td>5.0 mL multidose vial</td>
<td>&lt;2 years</td>
<td>245</td>
<td>No</td>
<td>IM⁵</td>
</tr>
<tr>
<td>FluBlok Quadrivalent</td>
<td>Protein Sciences</td>
<td>0.5 mL, single-dose prefilled syringe</td>
<td>≥18 years</td>
<td>≥1</td>
<td>Yes**</td>
<td>IM³⁰</td>
</tr>
<tr>
<td>FluMist Quadrivalent</td>
<td>MedImmune</td>
<td>0.2 mL, single-dose prefilled</td>
<td>2 through 49 years</td>
<td>NR</td>
<td>No</td>
<td>NA⁵⁰</td>
</tr>
</tbody>
</table>

**Abbreviations:** ACIP = Advisory Committee on Immunization Practices; ID = intradermal; IM = intramuscular; NA = not available; NR = not recommended does not contain thimerosal.

* Immunization providers should check Food and Drug Administration–approved prescribing information for 2017–18 influenza vaccines for the most complete and updated information, including (but not limited to) indications, contraindications, warnings, and precautions. Package inserts for U.S.-licensed vaccines are available at https://www.fda.gov/BiologicBloodVaccines/Vaccines/ApprovedProducts/ucm095833.htm. Availability of specific products and presentations might change and differ from what is described in this table and in the text of this report.

† Standard dose intramuscular (IM) contains 15 μg of each vaccine HA antigen (5 μg total for quadrivalent) per 0.5 mL dose.

‡ Intramuscular use is recommended for the 2017–18 season.

§ Intradermal administration is recommended for the 2017–18 season.

• Due to concern about missed opportunities, vaccination should not be delayed in order to obtain a specific product.

Many Different Flu Vaccines
No Preferences for Any Type (LAIV Not Recommended)

- ACIP/CDC express no preferences for any one type of influenza vaccine over another, where more than one is appropriate and available

- Due to concern about missed opportunities, vaccination should not be delayed in order to obtain a specific product.
Inactivated (IIV) vs. Recombinant (RIV) vs. Live Attenuated (LAIV)

- **IIV:**
  - Contain inactivated virus, split or subunit
    - High Dose or Standard Dose,
    - Trivalent or quadrivalent,
    - Unadjuvanted or adjuvanted
  - Many brands, some approved for those as young as 6 months of age
  - Most are intramuscular; one intradermal (for 18 through 64 years)
    - Egg- or cell culture-based

- **RIV:**
  - Contain recombinant HA
  - Egg-free
  - Trivalent or (starting in 2017-18) quadrivalent

**LAIV** (live attenuated virus) is **not recommended for use in 2017-18**
High-Dose vs. Standard-Dose (IIVs Only)

- **SD-IIIV3 and IIIV4:**
  - Contain 15µg of HA total per virus (45µg total for trivalents and 60µg total for quadrivalents)

- **HD-IIIV3 (Fluzone High Dose):**
  - Approved for use in those ≥65 years
  - Contain 60µg of HA total per virus (180µg total).
  - Observed to provide stronger immune response and have greater efficacy in persons aged ≥65 years
Unadjuvanted or adjuvanted (IIVs Only)

- Currently licensed U.S. influenza vaccines are unadjuvanted, with one exception

- aIIV3 (Fluad first available in U.S. for 2016-17)
  - Approved for use in those ≥65 years
  - Contains MF59, an oil-in-water adjuvant
  - Intended to provide better immune response
  - Non-inferior response compared with IIV3 in pre-licensure studies

- Safety established in multiple clinical and observational studies (more injection site reactions versus standard-dose vaccine)

- >60 million doses distributed worldwide for use in adults age 65 years and older by 2013
Egg-Based vs. non Egg-Based

- For most influenza vaccines, viruses are propagated in eggs. Two exceptions:
  - cllIV4 (Flucelvax Quadrivalent):
    - Viruses are propagated in canine kidney cells rather than eggs
    - However, some of the initial viruses supplied to the manufacturer are egg-derived (for 2017-18, only the H3N2 is cell-derived), so not considered egg-free
  - RIV3/RIV4 (Flublok):
    - HA is produced without viruses, by introduction of HA genetic sequence into an insect cell line (Spodoptera frugiperda) using a Baculovirus vector
    - Considered egg-free
Influenza Vaccination of Persons with Egg Allergy

- **Unchanged** from 2016-17
- Egg allergic persons can receive any licensed, recommended vaccine that is otherwise appropriate (IIV or RIV)
  - However, RIV not licensed for persons under 18 years of age
- One additional measure remains for persons with a history of severe allergic reaction to egg (i.e., any symptom other than hives)
  - “The selected vaccine should be administered in an inpatient or outpatient medical setting (including but not necessarily limited to hospitals, clinics, and physician offices). Vaccine administration should be supervised by a health care provider who is able to recognize and manage severe allergic conditions.”
- No specific post-vaccination observation period recommended
  - However, per the ACIP General Best Practices guidelines, providers should consider observing all recipients of any vaccine for 15 minutes to avoid injury due to syncope
MDPH Immunization Program
Contact Information

Immunization Program Main Number
For questions about immunization recommendations, disease reporting, etc.
• Phone: 617-983-6800
• Fax: 617-983-6840
• Website: www.mass.gov/dph/imm

MIIS Help Desk
• Phone: 617-983-4335
• Fax: 617-983-4301
• Email: miishelpdesk@state.ma.us
• Websites: www.contactmiis.info | www.mass.gov/dph/miis

MDPH Vaccine Unit
• Phone: 617-983-6828
• Fax: 617-983-6924
• Email: dph-vaccine-management@state.ma.us
• Website: www.mass.gov/dph/imm (click on Vaccine Management)
EXTRAS
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 high risk of complications and severe illness.
  - Contacts and caregivers of these people, and of infants under age 6 months (because there is no vaccine approved for children this age).

Groups at Increased Risk for Influenza Complications and Severe Illness

- Children aged 6 through 59 months and adults aged ≥50 years (children under 6 months of age are also at high risk, but cannot be vaccinated);
- Persons with chronic pulmonary (including asthma) or cardiovascular (except isolated hypertension), renal, hepatic, neurologic, hematologic, or metabolic disorders (including diabetes mellitus);
- Immunosuppressed persons;
- Women who are or will be pregnant during the influenza season;
- Children and adolescents (aged 6 months–18 years) who are receiving aspirin therapy and who might be at risk for experiencing Reye syndrome after influenza virus infection;
- Residents of nursing homes and other long-term care facilities;
- American Indians/Alaska Natives; and
- Persons who are extremely obese (BMI ≥40).

Egg Allergy Algorithm

- No longer printed in the MMWR
Has the child received ≥2 total doses of trivalent or quadrivalent influenza vaccine before July 1, 2017? (Doses need not have been received during the same season or consecutive seasons.)

- If two cumulative doses received prior to July 1, 2017, only one dose needed for 2017-18
- Similar to past two seasons

1 dose of 2017–18 influenza vaccine

2 doses of 2017–18 influenza vaccine (administered ≥4 weeks apart)