

Flu Vaccine Efficacy Knowledge Sheet

1. How effective is the flu vaccine?

How well the flu vaccine works (or its ability to prevent influenza) can vary widely from season to season. The vaccine's effectiveness can also vary depending on whom is being vaccinated. At least two factors play an important role in determining the likelihood that the flu vaccine will protect a person from influenza:

- 1) Characteristics of the person being vaccinated (such as their age and health)
- 2) The similarity or "match" between the flu viruses (A and/or B strains) the vaccine is designed to protect against and the flu viruses spreading in the community

During years when the flu vaccine is not well matched to circulating viruses, it's possible that no benefit from flu vaccination may be observed. During years when there is a good match between the flu vaccine and circulating viruses, it's possible to measure substantial benefits from vaccination in terms of preventing influenza.¹

2. Why are there so many different outcomes for vaccine effectiveness studies?

Results of studies that assess how well a flu vaccine works can vary based on study design, outcome(s) measured, population, and the season in which the vaccine was studied. These differences can make it difficult to compare study results. As there is interest in how well flu vaccines may prevent illness, hospitalization, and even death from influenza, many outcomes need to be considered.¹

3. The Centers for Disease Control and Prevention (CDC) provided an interim estimate of vaccine effectiveness for the northern hemisphere 2017-18 seasonal influenza vaccine of 36%. What does this mean?

The estimated vaccine effectiveness, based on data from February 2018, implies that vaccination with the seasonal influenza vaccine reduces a person's risk of being diagnosed by a doctor with laboratory-confirmed influenza virus infection by 36% among people of all ages. During seasons when most circulating influenza viruses are closely related to the viruses in the influenza vaccine, the vaccine effectiveness estimate has ranged from 50% to 60% among the overall population. Even during seasons like the 2017-18 season, when vaccination effectiveness is reduced, vaccination still offers substantial benefits, including a reduction in severe flu outcomes (like hospitalization or death).²

4. What viruses are recommended to be in the quadrivalent influenza vaccine for use in the 2018-19 northern hemisphere influenza season?

The World Health Organization (WHO) recommends that quadrivalent influenza vaccines for use in the 2018-19 northern hemisphere influenza season contain the following viruses³:

- an A/Michigan/45/2015 (H1N1)pdm09-like virus
- an A/Singapore/INFIMH-16-0019/2016 (H3N2)-like virus
- a B/Colorado/06/2017-like virus (B/Victoria/2/87 lineage)
- a B/Phuket/3073/2013-like virus (B/Yamagata/16/88 lineage)

5. What happens after the WHO recommendations are made?

The WHO publishes and updates a list of candidate vaccine viruses for selection by manufacturers and regulatory agencies.⁴ Approval of the composition and formulation of vaccines that will be used in each country is the responsibility of national or regional authorities. It is the responsibility of the vaccine manufacturer to obtain the appropriate candidate vaccine viruses and to obtain approval from the local regulatory agency.

6. What viruses make up the quadrivalent vaccine Quest Diagnostics will be providing?

The quadrivalent vaccines Quest Diagnostics will provide this year are made up of the following viruses:

- Afluria (10-shot vial containing thimerosal)
 - 1) an A/Singapore/GP1908/2015 (H1N1)
 - 2) an A/Hong Kong/4801/2014 (H3N2)
 - 3) a B/Brisbane/46/2015 (B/Victoria lineage)
 - 4) a B/Phuket/3073/2013 (B/Yamagata lineage)

7. Why are the viruses in the vaccine Quest Diagnostics is providing different from the viruses as recommended by the WHO?

Strains included in flu vaccines can differ from the WHO recommendation at the vaccine manufacturer's discretion. The manufacturer of the vaccines Quest Diagnostics will be offering chose to include different viruses in the vaccine than the WHO recommendation. However, the vaccine Quest Diagnostics will be providing includes an H1N1-like virus, an H3N2-like virus, and two B-strains from the lineages the WHO recommends for the 2018-19 season.

8. What is the difference between trivalent and quadrivalent flu vaccines?

The trivalent vaccine is a vaccine that confers protection against three separate virus strains; two influenza A strains and one influenza B strain.

The quadrivalent flu vaccine is designed to protect against four different influenza viruses; two influenza A viruses and two influenza B viruses. Adding another B virus to the vaccine aims to give broader protection against circulating influenza viruses.⁵

9. Why is Quest Diagnostics only offering the quadrivalent vaccine at onsite events?

The trivalent vaccine has been discontinued. Quest Diagnostics has committed to the quadrivalent vaccine because the quadrivalent vaccine includes an additional strain of the influenza virus, increasing protection for vaccine recipients.

References

1. *Centers for Disease Control and Prevention*. Vaccine Effectiveness - How Well Does the Flu Vaccine Work? September 14, 2017. <https://www.cdc.gov/flu/about/qa/vaccineeffect.htm>. Retrieved July 31, 2018.
2. *Centers for Disease Control and Prevention*. Seasonal Influenza Vaccine Effectiveness, 2005-2018. February 15, 2018. 2018. <http://www.cdc.gov/flu/professionals/vaccination/effectiveness-studies.htm>. Retrieved July 31.
3. *World Health Organization*. Recommended composition of influenza virus vaccines for use in the 2018-2019 northern hemisphere influenza season. (n.d.). February 2018. http://www.who.int/influenza/vaccines/virus/recommendations/201802_recommendation.pdf. Retrieved July 30, 2018.
4. *World Health Organization*. WHO Consultation and Information Meeting on the Composition of Influenza Virus Vaccines for Use in the 2018-2019 Northern Hemisphere Influenza Season. (n.d.). February 2018. <http://www.who.int/influenza/vaccines/virus/recommendations/consultation201802/en/>. Retrieved July 30, 2018.
5. *Centers for Disease Control and Prevention*. Quadrivalent Influenza Vaccine. December 14, 2017. <http://www.cdc.gov/flu/protect/vaccine/quadrivalent.htm>. Accessed July 31, 2018.