Influenza Updates: Reductions in Burden of Disease

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Influenza vaccination recommendations over time

Before 2000:
- Persons aged 65 or older
- Persons with high-risk chronic medical conditions
- Pregnant women in the second or third trimester
- Household contacts of the above
- Health care workers

2000:
- Adults 50 and older

2004:
- Children aged 6—23 months
- Household contact of children aged 0--23 months
- Women who will be pregnant during influenza season

2006:
- Children aged 6—59 months
- Household contacts of children aged 0—59 months

2008:
- All children aged 6 months—18 years

2010:
- All persons > 6 months in the US
During the last decade...

- More people getting vaccinated with influenza vaccines
- Greater use of vaccines in persons at high risk of complications
- More awareness of the need for vaccination
- Some skepticism of the value of influenza vaccination

Are influenza vaccines effective in preventing influenza-associated illnesses each year?
Measuring influenza vaccine effectiveness in the U.S.

- New Vaccine Surv. Network
- Emerging Inf. Program
- Marshfield Clinic
- US VE Network - 1
- US VE Network - 2
- Special studies

6 – 59 mo. OP, Hosp.
6 – 23 m Hosp.
6–59m Hosp.
Adults >18 y Hosp.
Adults > 50 y Hosp.

ACIP recommended groups
MAARI

ACIP recommended groups - MAARI

HCWs, Peds., ICU, Pregnant

All Ages MAARI

03-04 05-06 07-08 09-10 11-12
During the last decade...

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Are influenza vaccines effective in preventing influenza-associated illnesses each year?

Yes.

... but the effectiveness varies by season, population, and outcome measured
Communicating influenza VE

Study results about how well a flu vaccine works can vary based on study design, outcome(s) measured, population studied and the season in which the vaccine was studied. These differences can make it difficult to compare one study’s results with another’s.

How well the flu vaccine works (or its ability to prevent influenza illness) can range widely from season to season and also can vary depending on who is being vaccinated.

While determining how well a flu vaccine works is challenging, in general, recent studies have supported the conclusion that influenza vaccination benefits public health, especially when the viruses in the vaccine and circulating viruses are well-matched. (See “Current Efforts to Study How Well Influenza Vaccines Work.”)
Impact of influenza vaccination program

• Question:
  Are influenza vaccine programs effective in reducing influenza-associated health outcomes in the population?

• Goal:
  Estimate the number of averted influenza-associated outcomes that result from influenza vaccination in the United States
Impact of influenza vaccination program

- Advantages:
  - Consistent and systematic approach across seasons
  - Uses data collected as core program activities (Influenza Division and Immunization Services Division)
  - Estimates can be updated annually
  - Illness/outcomes averted may be easier and more meaningful way to communicate value of vaccine
Impact of influenza vaccination program

1. Estimate observed annual burden of influenza-associated outcomes

2. Estimate observed risk of influenza-associated outcomes among susceptible individuals
   - Using data on annual vaccine coverage and vaccine effectiveness

3. Calculate expected burden of influenza-associated outcomes in population with no vaccination

4. Calculate difference in outcomes attributable to vaccination program

Burden of Disease

Since 2010-11, influenza has led annually to:

- 19 – 35 million cases of influenza respiratory disease
- 3.4 – 15.2 million clinic visits
- 110,000 – 592,000 hospitalizations
- 5,300 – 39,000 deaths

Vaccine Coverage

Influenza season

Percent vaccine coverage

Vaccine Effectiveness

- Varies by age group and season, 2010 – 2014*:
  - 6 mos – 4 yrs: 47 – 68%
  - 5 – 19 yrs: 46 – 61%
  - 20 – 64 yrs: 50 – 52%
  - 65+ yrs: 32 – 39%

*US Flu VE network, annual estimates
Disease Averted by Vaccination

- Since 2010-11, influenza vaccination has averted annually:
  - 1.6 – 7.2 million cases of influenza respiratory disease
  - 750,000 – 3.2 million clinic visits
  - 30,000 – 120,000 hospitalizations
  - 2,200 – 16,000 deaths
Communicating influenza vaccine impact

Estimated Influenza Illnesses and Hospitalizations Averted by Influenza Vaccination — United States, 2012–13 Influenza Season


Estimated Influenza Illnesses and Hospitalizations Averted by Vaccination — United States, 2013–14 Influenza Season

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The estimated number of influenza-associated illnesses prevented by flu vaccination during the 2013-2014 season: 7.2 million.

The estimated number of flu-associated medical visits prevented by vaccination during the 2013-2014 season: 3.1 million.

The estimated number of flu hospitalizations prevented during the 2013-2014 season: 90,000.

- enough people to form a line from Maine to Oregon
- more than the population of the city of Chicago
- enough to fill Madison Square Garden more than 4 times

Data: Morbidity and Mortality Weekly Report (MMWR), December 12, 2014: Vol. 63, No. 49

www.cdc.gov/flu
Conclusion

• Substantial annual averted disease burden from the influenza vaccination program
  ▪ Varies by VE and annual disease burden

• Program improvements will be made by
  ▪ increasing coverage in non-elderly persons
  ▪ improving effectiveness of vaccines, especially in elderly persons
Conclusion

• Annual estimates provide
  ▪ Comparison across seasons to examine impact of changes in burden, VE, and VC
  ▪ Help identifying and prioritizing data needed to routinely evaluate program impact

• Ongoing work to include indirect effects of vaccination
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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.