

ACIP Update: School-age Children and Other Changes or Issues

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Overview

- Recommendations changes over time
- New recommendations for 2008
- Recent vaccine effectiveness studies
- Cautionary notes as recommendations change

Recommendation Changes for Influenza Vaccination: Milestones through 2007

Before 2000:

Persons aged 65 or older

Persons with chronic medical conditions that make them more likely to have complications of influenza

Pregnant women in the second or third trimester

Contacts (household and out of home caregivers) of the above groups

Healthcare workers

2000: Adults 50 and older

2004: Children aged 6--23 months

Contacts (household and out of home caregivers) of children aged 0--23 months

Women who will be pregnant during influenza season

2006: Children aged 6--59 months

Contacts (household and out of home caregivers) of children aged 0-59 months



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73% of U.S. population!!



Universal Vaccination against Influenza: Increasing Interest

- Better understanding of health and economic impact of influenza among older children and adults
- Recognition of suboptimal vaccine effectiveness among groups at highest risk for influenza complications (e.g., elderly, persons with chronic illness)
- Potential for reducing community transmission though vaccinating school children and healthy adults if high coverage can be achieved
- Lessened concerns about vaccine supply
- Belief that current low coverage for most recommended groups might be improved by a simple universal recommendation
- Increased concern about an influenza pandemic – need to learn how to vaccinate an entire population against influenza

Expanding Influenza Vaccination Recommendations to School-Age Children: Critical Factors Considered by the ACIP

- Disease burden
- Vaccine effectiveness
- Vaccine safety
- Cost-effectiveness
- Vaccine supply
- Feasibility of sustained implementation

ACIP Conclusions: Vaccinating School Age Children Against Influenza

- **Disease burden**: Highest rates of influenza but severe outcomes less common than in older or younger age groups
- **Vaccine effectiveness**: Established effectiveness in reducing influenza illness among vaccinated; intriguing, but limited, evidence for indirect protection of unvaccinated contacts
- **Vaccine safety**: Established, but need for continued vigilance and long term studies
- **Cost-effectiveness**: Higher than many currently recommended vaccines but economic models do not fully account for potential indirect effects
- **Vaccine supply**: Adequate and improving, although local distribution issues remain problematic
- **Feasibility of sustained implementation**: Uncertain, but capacity to vaccinate school age children is not likely to be established until a recommendation is made

Rationale for Expanding Vaccination Recommendations to Include all School-age Children and Adolescents*

Rationale

- Evidence that influenza has substantial adverse impacts among school age children and their contacts (e.g., increased school absenteeism, antibiotic use, medical care visits, and parental work loss)
- Evidence that influenza vaccine is effective and safe for school-age children
- The expectation that a simple age-based influenza vaccine recommendation will improve current low vaccine coverage levels among the approximately 50% of school-age children who already had a risk- or contact-based indication for annual influenza vaccination

Also noted

- The potential for the indirect effect of reducing influenza among persons who have close contact with children, and reducing overall transmission within communities, if sufficient vaccination coverage among children can be achieved

***Approved at February 27, 2008 ACIP meeting.**

Begins in 2008-09 influenza season



New: Influenza Vaccination Recommendations for Children

- All children aged 6 months through 18 years should receive annual influenza vaccination, beginning in 2008 if feasible, and beginning no later than during the 2009-2010 influenza season

Recommendation Change for Influenza Vaccination: 2008-09 Season

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2008: **All children aged 6 months—18 years**



Other Changes in the 2008 ACIP Influenza Vaccine Recommendations

- Either TIV or LAIV should be used when vaccinating healthy persons aged 2--49 years
 - 2 doses separated by ≥ 4 weeks for children aged 6 months—8 years receiving vaccination for the first time
 - Children 2—4 years old should be screened for reactive airways disease before receiving LAIV (MMWR Nov 23 2007)
- All new 2008–2009 trivalent vaccine virus strains
 - A/Brisbane/59/2007 (H1N1)-like
 - A/Brisbane/10/2007 (H3N2)-like
 - B/Florida/4/2006-like

Multi-state Case-Control Study of the Effectiveness of Influenza Vaccine in Preventing Laboratory-Confirmed Influenza Hospitalizations among Children Aged 6-23 Months During the 2005-06 and 2006-07 Seasons

DK Shay, MD, MPH et al

Influenza Division, CDC and Emerging Infections Program sites



Vaccine Effectiveness among 6-23 Month Old Children: Objectives and Methods

- Objective: To estimate vaccine effectiveness in preventing hospitalizations among children aged 6-23 months during 2005-06 and 2006-07 influenza seasons
 - Setting: Emerging Infections Program study sites
 - Outcome: Lab-confirmed influenza-related hospitalizations

Vaccine Effectiveness against Hospitalization among 6-23 Month Old Children

Crude VE by immunization status

Full	95% CI	Partial	95% CI
74%	44% to 88%	39%	-10% to 66%

Adjusted* VE by immunization status

Full	95% CI	Partial	95% CI
76%	41% to 91%	27%	-39% to 62%

* Adjusted for high-risk conditions, VLBW, and insurance status

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Conclusions

- 76% effectiveness against hospitalization among 6-23 month old children who were fully vaccinated (2 doses if first year of vaccination)
- Unable to show significant protection unless fully vaccinated
- Underscores need to give 2 doses in first year
- Excellent protection for infants and toddlers who are much higher risk for severe outcomes compared to older children

Interim Within-Season Estimate of the Effectiveness of Trivalent Inactivated Influenza Vaccine – Marshfield, Wisconsin, 2007-08 Influenza Season

MMWR 2008;57:393-8.

DK Shay (CDC), E Belongia (Marshfield Clinic), et al



Objectives

- Estimate vaccine effectiveness for preventing medically attended acute respiratory illness (MAARI) which is lab-confirmed as influenza
- Provide interim and final estimates of vaccine effectiveness for the 2007-08 influenza season

Conclusions: Interim Vaccine Effectiveness Estimate

- Despite a suboptimal match between 2 of 3 vaccine strains and viruses isolated from study participants, interim vaccine effectiveness was 44%
- Vaccine effectiveness against influenza A(H3N2) was 58% vs. no vaccine effectiveness against influenza B
- Must interpret antigenic characterization data with clinical effectiveness data
- Feasible to produce within-season estimates of vaccine effectiveness in the United States
- Final end-of-season estimate will be available this summer

What's Next?

- Challenges of annually vaccinating 58 million school age children
- Evaluating impact of vaccinating children
 - Large population-based surveillance platforms needed
- Considering a true universal vaccine recommendation – add healthy adults aged 19--49

**Myth: Simpler vaccination
recommendations
(i.e., universal vaccination)
will be a relief...**

Reality: Vaccinating everybody ≠ simpler recommendations

- Current vaccines are not optimized to protect those at highest risk for complications (i.e., elderly, chronically ill, infants)
- Better vaccines might soon be available, and there will be varying indications and contraindications for new influenza vaccines
- New vaccines won't be available for all who want or need them initially, and use will have to be prioritized

Risk- and age- based recommendations redux!



Healthcare Providers and Immunization Programs Must keep Pace With Progress in Preventing Influenza

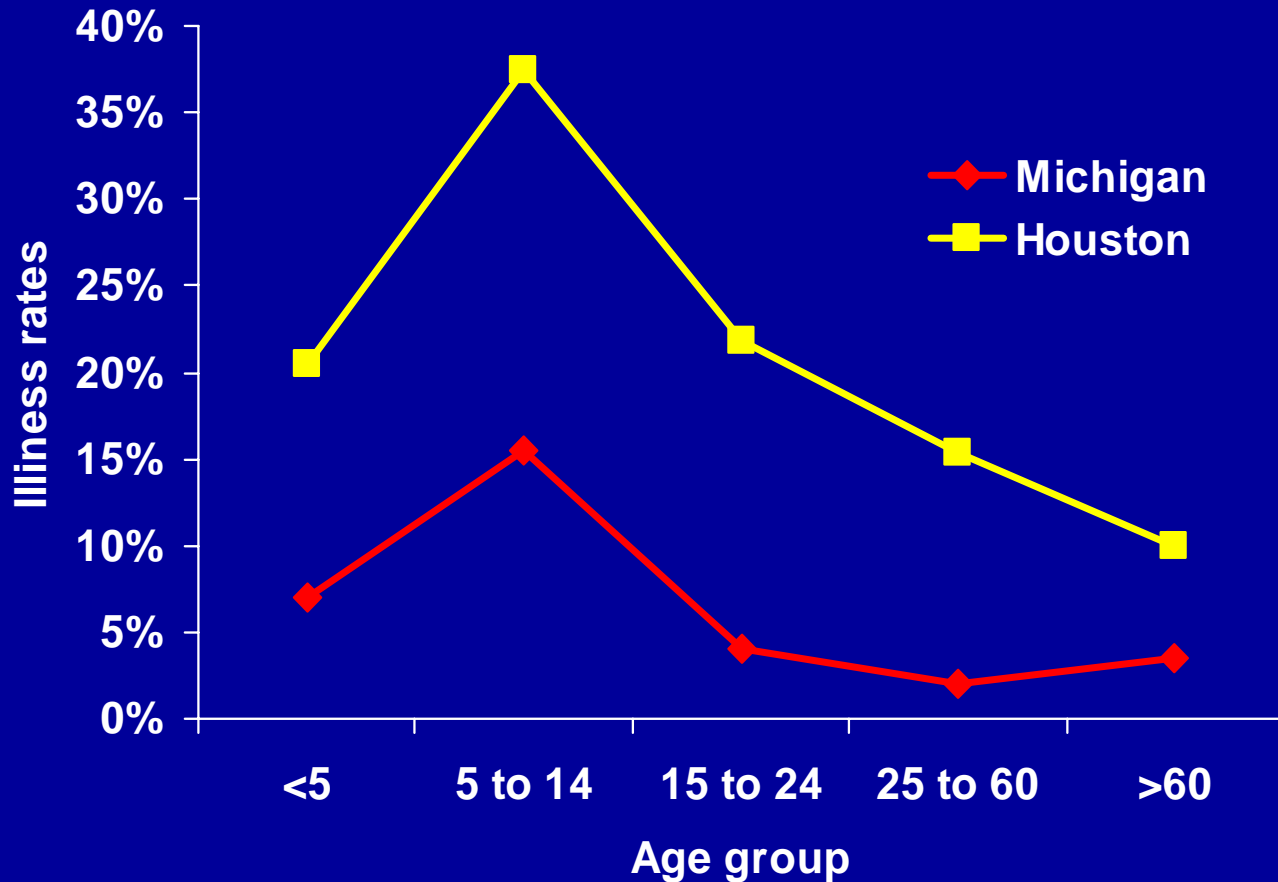
- If we all agree that it's important to prevent influenza, then providers and programs must accept need for yearly education
- Which influenza vaccines are recommended for which patients
- Which influenza vaccines are contraindicated or suboptimal for which patients
- Current influenza epidemiology

Vaccinators in Non-medical Venues must Integrate with Critical Medical and Public Health Systems

- Provide information about receipt of vaccination to private providers
- Enter vaccination information into vaccine registries
- Provide adverse events reports

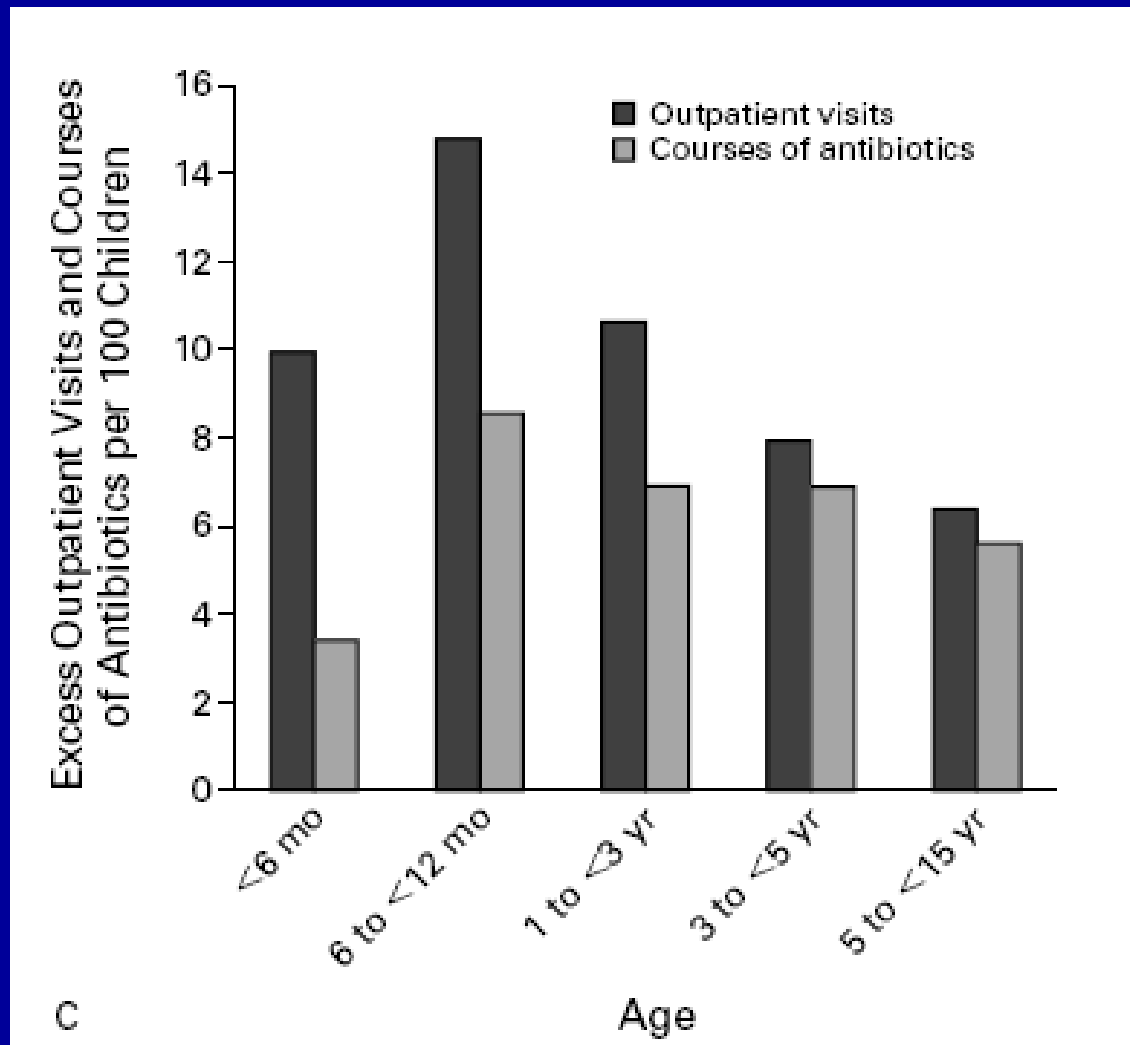
Thank you!

Average Influenza-Associated Illness Rates by Age Group*



Sources: Monto J Infect Dis
Glezen N Engl J Med

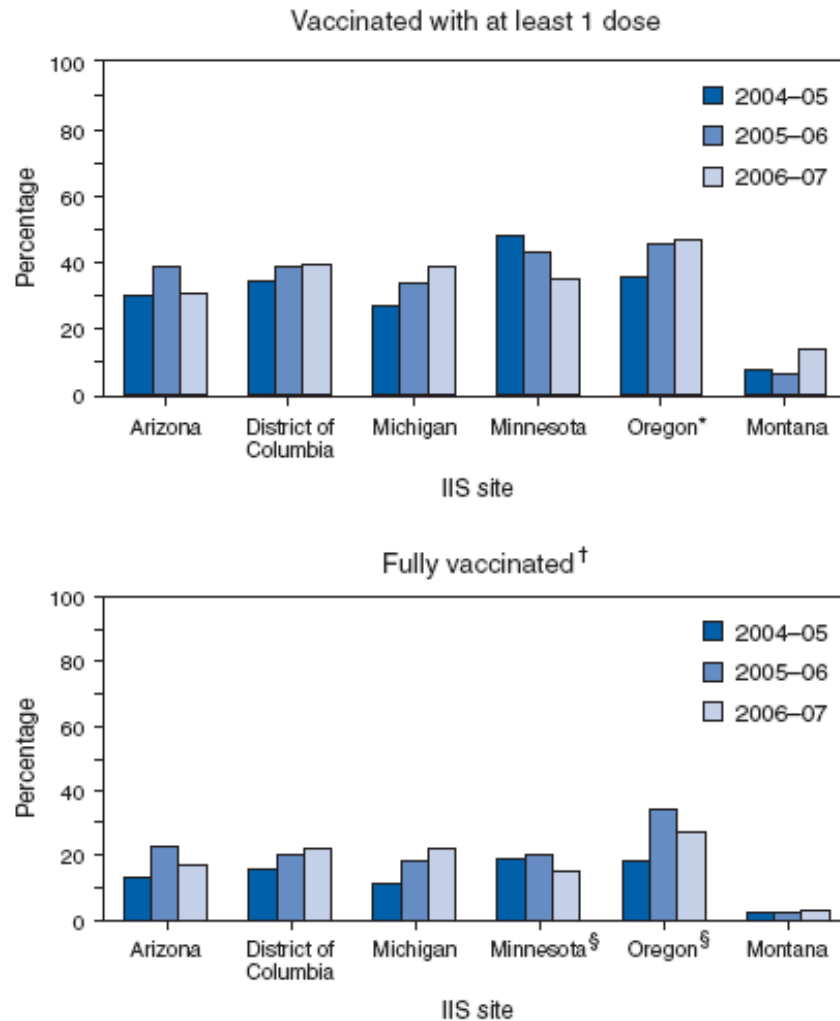
Excess Outpatient Visits and Antibiotic Courses Attributed to Influenza among Children, by Age Group, 1973-1993



Source: Neuzil, et al
N Engl J Med 2000

Recent Influenza Vaccine Coverage Data, United States

FIGURE 1. Influenza vaccination coverage among children aged 6–23 months — six immunization information system (IIS) sentinel sites, United States, 2004–05, 2005–06, and 2006–07 influenza seasons



SOURCE: CDC. Influenza vaccination coverage among children aged 6–23 months—six immunization information system sentinel sites, United States, 2005–06 influenza season. MMWR 2006;55:1329–30.

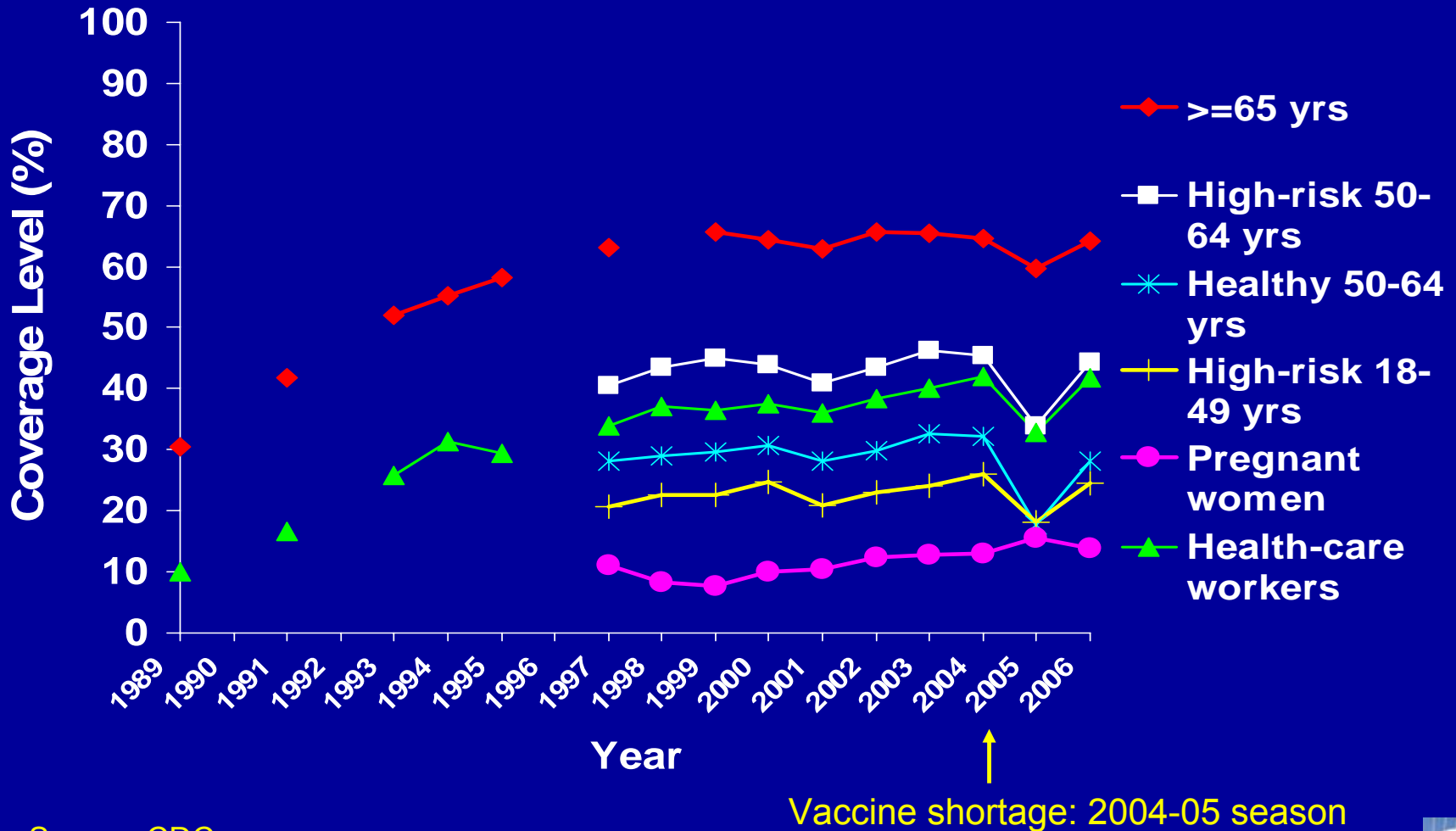
Coverage levels slow to no increase over 3 years

Other recently introduced vaccines (varicella, hepatitis B, PCV7) have had better coverage (43–73%) 3 years after initial recommendation

Source: CDC. MMWR 2007;56:963-5



Self-Reported Influenza Vaccination Coverage Levels Among Selected Priority U.S. Adult Populations, 1989-2006, National Health Interview Survey



Source: CDC.

<http://www.cdc.gov/flu/professionals/vaccination/pdf/vaccinetrend.pdf>



Options to Improve Influenza Prevention Efforts

- Improve vaccination of existing target groups
 - Improve public awareness
 - Improve provider education and practices
 - Improve access to vaccination services

Options to Improve Influenza Prevention Efforts

- Improve vaccination of existing target groups
 - Improve public awareness
 - Improve provider education and practices
 - Improve access to vaccination services
- Establish a universal vaccination recommendation
 - Beginning with school-age children
 - Strengthen adult vaccination efforts
 - Emphasize importance of preventing influenza in all age groups