### Newsletter Topics

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Viral Lower Respiratory Tract Disease Decreased After Pneumococcal Vaccines in Adults

- A total of 13,856 patients with virus-associated lower respiratory tract infection (LRTI) and 227,887 matched controls were studied in relation to their receipt of 13-valent pneumococcal conjugate vaccine (PCV13).
- PCV13 had a vaccine efficacy (VE) of:
  - 24.9% against virus-associated pneumonia.
  - 21.5% against other non-pneumonia virus-associated LRTIs.
  - 26.8% against all virus-associated LRTI episodes diagnosed in inpatient settings.
  - 18.6% against all virus-associated LRTI episodes diagnosed in outpatient settings.
- Statistically-significant protection with PCV13 were found against LRTI episodes associated with influenza A and B viruses, endemic human coronaviruses, parainfluenza viruses, human metapneumovirus, and enteroviruses but not with either respiratory syncytial virus or adenoviruses.

See the *Journal of Infectious Diseases*, February 15, 2023.

US Infant Pertussis Incidence Trends Before and After Maternal Tdap

- In 2011, CDC recommended Tetanus-Diphtheria-Pertussis vaccine (Tdap) for pregnant women to decrease pertussis in infants too young to be fully vaccinated.
- National pertussis incidence was tracked between 2000-2019.
  - During the pre-maternal Tdap vaccination period, the mean annual pertussis incidence among infants younger than 2 months was 165.3 per 100,000 infants.
  - After the new recommendations, infant pertussis decreased to 80.9 per 100,000 in 2017-2019 as maternal Tdap vaccinations rose to 54.9% in 2019.
- A higher Tdap coverage in pregnant women would likely decrease infant pertussis incidence even further.


Influenza Vaccine Decreased Influenza Infection by About One-Third in Recent Season

- During the 2021-2022 influenza season:
  - Vaccine effectiveness against all influenza was 57%.
  - Vaccine effectiveness against Influenza A(H3N2) was 36%.

See *Clinical Infectious Diseases*, April 15, 2023.

Early Human Papillomavirus Vaccine Increases Chances of Series Completion Before 15 Years

- Based on data from the *National Immunization Survey-Teen, 2017-2020*, those receiving HPV vaccine starting at ages 9-10 years-old instead of 11-12 years-old were:
  - More likely to complete the HPV series by ages 13 years (74.0% vs 31.1%) and by 15 years (91.7% vs 82.7%).
  - Less likely to complete the HPV series within 3 years (82.3% vs 84.9%).
- Starting routine HPV vaccination at ages 9-10 years may improve vaccination coverage rates in early and mid-adolescence.

See *Pediatrics*, February 27, 2023.
Vaccine in Development to Prevent Valley Fever in Dogs and Humans

- Since infections with *Coccidioides* species result in life-long protection, vaccine candidates are being studied.
- At the University of Arizona, complete deletion of a gene from *C. posadasii* has resulted in a 1st-generation replication-incompetent mutant, called *delta-cps1*.
- Vaccination with *delta-cps1* has been very protective in animal studies against infection with both *C. immitis* and *C. posadasii*.
- A *delta-cps1* vaccine is in development to prevent coccidioidomycosis (Valley Fever) in dogs.
- In addition, efforts are now underway to develop a *delta-cps1* vaccine for humans.

For further details, see *Journal of Fungi*, August 10, 2022.

Real World Effectiveness of Monkeypox Vaccination

- Whether by subcutaneous or intradermal administration, the efficacy of monkeypox vaccination at 3 months after vaccination was:
  - 75% for one dose.
  - 86% for two doses.


Confidence in Routine Childhood Vaccines in the U.S. Is Higher than in COVID-19 Vaccines

- 88% of adults say that the benefits of measles-mumps-rubella (MMR) vaccines outweigh the risks.
- Roughly half of mothers with a child under 18 years rate the risk of side effects from MMR vaccines as medium or high.
- About half of parents with a young child 0-4 years old say that they worry that not all of the childhood vaccines are necessary.
- Only 45% of U.S. adults say that the health benefits of COVID-19 vaccines are high.


**COVID-19 AND COVID-19 VACCINES**

**COVID-19 Vaccine Effectiveness in 5- to 11-year-olds**

- Vaccine efficacy (VE) in 5- to 11-year-olds after the second dose of a COVID-19 vaccine primary series was 66%.
- The SARS-CoV-2 antibodies where the primary dosing interval was < 8 weeks waned more quickly than antibodies where the two doses were spaced by ≥ 8 weeks.
- VE against severe outcomes was 94% in the period 7-29 days after 2 doses, but declined to 57% after ≥ 120 days.

Higher Death Rates in Elderly if Unimmunized Versus Bivalent COVID-19 Vaccine Recipients

- Comparing death rates from COVID-19 between elderly unvaccinated people and people who received a bivalent COVID-19 vaccine during one of three SARS-CoV-2 variant periods:
  - BA.5 predominance (early fall 2022): 16.3% higher deaths in unimmunized.
  - BQ.1/BQ.1.1 predominance (late fall 2022): 11.4% higher deaths in unimmunized
  - XXB.1.5 predominance (early 2023): 8.4% higher deaths in unimmunized.

See MMWR, June 16, 2023.

Fewer COVID-19 School Absenteeism and Pediatric Hospitalizations with Bivalent Boosters

- A simulation model predicted that COVID-19 bivalent booster campaigns achieving an uptake similar to seasonal influenza vaccination among children 5-17 years old could have prevented:
  - 5,448,694 days of school absenteeism.
  - 10,019 pediatric hospitalizations (2,646 needing ICU care).
- A similar COVID-19 bivalent campaign that reached only 50% of the age-specific uptake of influenza vaccination could have averted:
  - 2,875,926 days of school absenteeism among children aged 5 to 17 years.
  - 5,791 hospitalizations among children 0 to 17 years (1,397 needing ICU care).


Safety of Pfizer COVID-19 Vaccine by Commercial Database Analysis

- Using commercial databases for over 3 million children ages 5- to 17-year-old to study 20 prespecified outcomes after COVID-19 vaccines, the only statistically significant signal was for myocarditis or pericarditis.
  - For the subset of younger children (ages 5-11 years), there was no signal for myocarditis or pericarditis.


More Young Children Died from COVID-19 than from Other Vaccine-Preventable Diseases

- Dr. Paul Offit explains that even though children are at less risk from COVID-19 than adults, children are still at risk of serious and rarely fatal infections from COVID-19.
  - Between October 2020 and October 2021, 66 children aged 5-11 years died of SARS-CoV-2 infection.
  - The estimated incidence of myocarditis after mRNA COVID vaccines in 5- to 11-year-olds is about 1 in 500,000 (usually a mild illness).
- In comparison, prior to the availability of a vaccine, estimated yearly deaths in the U.S. were: 3 children died of hepatitis A virus, 8 children died of meningococcus, 16 children died of varicella, 17 people of all ages died of rubella, and 20 children died of rotavirus.

For more details, see JAMA Pediatrics, January 23, 2023.
VACCINE HISTORY

The Three Waves in Modern Anti-Vaccine Efforts

- The modern anti-vaccine movement has come in three distinct waves related to:
  1) Pertussis vaccine (DTP): Claims of seizures and developmental delay after DTP.
  2) Measles vaccine (MMR): Accusations of autism after MMR.
  3) COVID-19 vaccines: The idea of individualism superseding the responsibility for community health.

- Suggestions of long-term steps to counter anti-vaccine views: Better science education of young people and promotion of science literacy to the general public.


RESOURCES

Updated Schedules for COVID-19 Vaccinations

- Tables of COVID-19 vaccination schedules based on age, health status, and products.
- Infographics for bivalent COVID-19 vaccine administration
  - Non-Immunocompromised
  - Moderately or Severely Immunocompromised:

See tables and infographics at Interim Clinical Considerations for Use of COVID-19 Vaccines in the United States.

CDC Resources to Build COVID-19 Vaccine and Other Vaccine Confidence

- Strategies to Reinforce Vaccine Confidence.
- 12 COVID-19 Vaccination Strategies for Your Community.

Report Adverse Events Occurring After Vaccines to Vaccine Adverse Event Reporting System (VAERS)

- Healthcare providers are required by law to report to VAERS:
  - Any adverse event listed in the VAERS Table of Reportable Events Following Vaccination that occurs within the specified time period after vaccinations.
  - An adverse event listed by the vaccine manufacturer as a contraindication to further doses of the vaccine that occurs after a vaccine.
  - The reporting requirement also includes events occurring after COVID-19 vaccines and Mpox vaccines as explained on the VAERS website.

- Healthcare providers are strongly encouraged to report to VAERS:
  - Vaccine administration errors.
  - An adverse event that occurs after the administration of a vaccine licensed in the U.S., whether it is or is not clear that a vaccine caused the adverse event.
Promoting Vaccine Confidence by Communicating with Families

- The American Academy of Pediatrics has a website to assist providers in promoting vaccine confidence. Items include:
  - Talking Points to answer parents’ questions.
  - Toolkits for influenza, HPV, and COVID-19 vaccines.
  - Free images of children and vaccinations.

Public Health Image Library (PHIL) as a Resource for Illustrations

- PHIL contains public health images from the CDC that are not copyrighted, so they may be used in presentations with appropriate acknowledgement.
- The imagery showcased in the PHIL is historic in nature, so it should not to be used as a source of the most current public health information.

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