Vaccines in Public Health

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Advisory Committee on Immunization Practices (ACIP)
ACIP founded in 1964

- Provide external advice to CDC and Secretary of Dept of Health and Human Services on the use of vaccines in the US
- ACIP was established under Section 222 of the Public Health Service Act (42 U.S.C. § 217a) and is governed by its charter
  [http://www.cdc.gov/vaccines/acip/committee/charter.html](http://www.cdc.gov/vaccines/acip/committee/charter.html)
Previous Experience

- Ad hoc committees
  - Use of polio vaccine
  - Cutter incident (polio vaccine only partially inactivated resulting in polio cases)
Purpose of ACIP

The Advisory Committee on Immunization Practices (ACIP) is a group of medical and public health experts that develops recommendations on how to use vaccines to control diseases in the United States. The recommendations stand as public health advice that will lead to a reduction in the incidence of vaccine preventable diseases and an increase in the safe use of vaccines and related biological products.
ACIP Composition

- 15 voting members
- 8 ex officio members
- Representatives from 29 liaisons organizations
- Careful screening to avoid conflicts of interest
ACIP Meetings

- Meets three times each year
- May call emergency/interim meetings
  - 2009 pandemic H1N1
  - 2014 to consider PCV13 for elderly
ACIP Tasks

- Immunization schedules
  - Updated frequently; published annually
  - Childhood since 1995
  - Adult since 2002

- Empowered to include routinely administered vaccines coverage by Vaccines For Children (VFC)
  - VFC provides entitlement to free vaccine for all children aged 0-18 yr who are uninsured, Medicaid-eligible, American Indian/Alaska Native or underinsured
ACIP Tasks

- By charter
- Deliberations to include:
  1. Consideration of disease epidemiology and burden
  2. Vaccine efficacy and effectiveness
  3. Vaccine safety
  4. Economic analysis
  5. Implementation issues
ACIP Approach

- GRADE system in 2010
  - Grading of Recommendations Assessment, Development and Evaluation
  - Systematic assessment of type and quality of evidence about a vaccine’s expected impact

- Standardized guidance for economic studies
Wisconsin Council on Immunization Practices

- Meets quarterly
- Wide representation from immunizers
- Meeting notes distributed to immunizing pharmacists
- Periodic communication regarding current issues
Benefit of Vaccines
Success of Vaccines

- Routine childhood immunization....
  - Saves 33,000 lives annually
  - Prevents 14 million cases of disease
  - Reduces health care costs by $9.9 billion
  - Saves $33 billion in indirect costs
Work to Do

- Increasing immunization rates
  - 42,000 adults and 300 children die of vaccine preventable diseases each year
- Diseases for which vaccines have not been developed
Infant Immunization Rates

Vaccine-specific coverage* among children 19-35 months, National Immunization Survey, 1994-2012

* The Healthy People 2020 target for coverage is 90% for all vaccines with the exception of rotavirus (80%) and HepA (85%).

* DTP (3+) is not a Healthy People 2020 objective. DTaP (4+) is used to assess Healthy People 2020 objectives.

§ Reflects 3+ doses through 2008, and Full Series (3 or 4 doses depending on type of vaccine received) 2009 and later.
FIGURE. Vaccine coverage rates among preschool-aged children* — United States, 1967–2012

Abbreviations: DTP/DTaP = diphtheria, tetanus, pertussis or diphtheria, tetanus, acellular pertussis; MMR = measles, mumps, and rubella; Hib = Haemophilus influenzae type b; Hep B = hepatitis B; PCV = pneumococcal conjugate vaccine; RV = rotavirus vaccine; Hep A = hepatitis A.

* Children in the United States Immunization Survey and National Health Interview Survey were aged 24–35 months. Children in the National Immunization Survey were aged 19–35 months.

† Numbers in parentheses refer to the number of doses of that vaccine being tracked in this figure.

§ For rotavirus vaccine, 2 or 3 doses are tracked, depending on the type of rotavirus vaccine received.
FIGURE 2. Estimated vaccination coverage with ≥1 dose of human papillomavirus (HPV) vaccine* among females aged 13–17 years† — United States, National Immunization Survey–Teen, 2014

* HPV vaccine, either quadrivalent or bivalent.
† Includes females (N = 10,084) born during the period January 1996–February 2002.
Estimated Vaccination Coverage of ≥1 Doses of Tdap Vaccine*
Among Adolescents Aged 13-17 Years†, National Immunization Survey - Teen, United States, 2013

* Tetanus Toxoid, Reduced Diphtheria Toxoid, and Acellular Pertussis (Tdap) Vaccine since age 10 years
† Includes adolescents born January 1995 through February 2001

National Coverage = 86% (sample size=18,204)
- ≤ 69% (1)
- 70-79% (7)
- 80-89% (30)
- ≥ 90% (13)
Healthy People 2020 Goals

- 80% annual influenza immunization rates for individuals aged 6 months to 64 years
  - Includes pregnant women
- 90% annual influenza immunization rates for
  - health care workers
  - >65 years
  - 18-64 years with high risk conditions
  - those in long term care or nursing home
FIGURE 1. Influenza vaccination coverage among adults aged ≥18 years, by age group, season-specific vaccination, and vaccination in previous 12 months — Behavioral Risk Factor Surveillance System, United States, 2007–08 through 2011–12 influenza seasons*

* Beginning in the 2011 BRFSS, surveys included both landline and cellular telephone households, and a new weighting method was used. The trend lines are discontinued from 2010–11 to 2011–12 influenza season to reflect this change.
 Victims of Their Own Success

- # of cases of disease = # of reported adverse effects
- Consider a success in public health

Nothing happens!
Impact of Influenza Vaccine

- 2013-14 seasonal immunization averted
  - 7.2 million cases of influenza
  - 90,000 hospitalizations
  - 3.2 million medically attended cases
Evolution of Immunization Program and Prominence of Vaccine Safety

1. Prevaccine
2. Increasing Coverage
3. Loss of Confidence
4. Resumption of Confidence
5. Eradication

Incidence

- Disease
- Vaccine Coverage
- Adverse Events
- Outbreak
- Eradication

Maturity
Licensure Process

- Similar to other medications
- Preclinical
- Phase I, II, III and post-marketing
Surveillance Systems

- Large linked databases
  - 10 large managed care organizations monitor vaccine safety

- Clinical Immunization Safety Assessment Network
  - Improve understanding of vaccine safety at individual level
  - Evaluate persons who experience adverse events
  - Gain better understanding of events
  - Develop protocols for providers
Vaccine Safety

More on this topic later in the semester