State of the Nation’s Immunization 2012: Challenges and Opportunities

Anne Schuchat, MD
RADM, US Public Health Service
Assistant Surgeon General
Director, National Center for Immunization and Respiratory Diseases

Texas Immunization Summit 2012 – Houston, Texas
September 27, 2012
State of the Nation is Strong

- Most vaccine-preventable diseases at record lows
- Achieved & sustained high childhood immunization
- Reduced disparities in childhood coverage
- Introduced multiple new vaccines
- Improved influenza vaccine supply
## Comparison of 20th Century Annual Morbidity and Current Morbidity: Vaccine-Preventable Diseases

<table>
<thead>
<tr>
<th>Disease</th>
<th>20th Century Annual Morbidity†</th>
<th>2011 Reported Cases ††</th>
<th>Percent Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smallpox</td>
<td>29,005</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>21,053</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Measles</td>
<td>530,217</td>
<td>222</td>
<td>&gt; 99%</td>
</tr>
<tr>
<td>Mumps</td>
<td>162,344</td>
<td>404</td>
<td>&gt; 99%</td>
</tr>
<tr>
<td>Pertussis</td>
<td>200,752</td>
<td>18,719</td>
<td>91%</td>
</tr>
<tr>
<td>Polio (paralytic)</td>
<td>16,316</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Rubella</td>
<td>47,745</td>
<td>4</td>
<td>&gt; 99%</td>
</tr>
<tr>
<td>Congenital Rubella Syndrome</td>
<td>152</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Tetanus</td>
<td>580</td>
<td>36</td>
<td>94%</td>
</tr>
<tr>
<td><em>Haemophilus influenzae</em></td>
<td>20,000</td>
<td>14*</td>
<td>&gt; 99%</td>
</tr>
</tbody>
</table>

†Source: JAMA. 2007;298(18):2155-2163

†† Source: CDC. MMWR August 17, 2012;61(32);624-637. (final 2011 data)

* *Haemophilus influenzae* type b (Hib) < 5 years of age. An additional 14 cases of Hib are estimated to have occurred among the 226 reports of Hi (< 5 years of age) with unknown serotype.
Increasing Vaccine-Specific Coverage Rates Among Preschool-Aged Children: 1967 - 2011

Target is 80% for Rotavirus and 60% for Hepatitis A

† DTP/DTaP (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

¶ 2 or 3 doses, depending on the type of rotavirus vaccine received

Note: Children in the USIS and NHIS were 24-35 months of age. Children in the NIS were 19-35 months of age.


Reported cases/100,000 population

Source: National Notifiable Diseases Surveillance System (NNDSS)
All-cause acute gastroenteritis (AGE) and rotavirus-positive hospitalizations among children <3 years, NVSN, 2006-2011

Payne DC, unpublished 2012

* >1 dose, any type

Est. 86-88% vaccine coverage *

0% vaccine coverage *
Cumulative Cases of PCV6-type IPD among Children <2 years old, 2006-2012

CDC Unpublished, Active Bacterial Core surveillance
Note: Excludes 2009 pandemic year
>80 million Americans vaccinated in response to pandemic H1N1 influenza
FLUVIEW
A Weekly Influenza Surveillance Report Prepared by the Influenza Division

Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), Weekly National Summary, September 28, 2008 – May 5, 2012

% of Visits for ILI

200840 200850 200910 200920 200930 200940 200950 201000 201010 201020 201030 201040 201050 201100 201110 201120 201130 201140 201150 201200 201210

Week

0 1 2 3 4 5 6 7 8

% ILI National Baseline
Who needs a flu vaccine?

Even healthy people can get the flu, and it can be serious.

Everyone 6 months and older should get a flu vaccine. This means you.

This season, protect yourself—and those around you—by getting a flu vaccine.

THE FLU ENDS WITH
Estimated Influenza Vaccination Coverage, Healthcare Personnel and Pregnant Women, Internet Panel Surveys

2009-10 (seasonal)  2010-11  2011-12

Healthcare Personnel
- 2009-10: 62%
- 2010-11: 64%
- 2011-12: 67%

Pregnant Women
- 2009-10: 49%
- 2010-11: 49%
- 2011-12: 47%

MMWR September 27, 2012
## Modeled Estimation of Impact of Influenza Immunization: Averted hospitalizations*

<table>
<thead>
<tr>
<th>Year</th>
<th>All ages</th>
<th>0-4 y</th>
<th>5-19 y</th>
<th>20-64 y</th>
<th>65+ y</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-06</td>
<td>13,217</td>
<td>2,046</td>
<td>547</td>
<td>1,929</td>
<td>8,695</td>
</tr>
<tr>
<td>2006-07</td>
<td>8,492</td>
<td>2,118</td>
<td>537</td>
<td>1,677</td>
<td>4,159</td>
</tr>
<tr>
<td>2007-08</td>
<td>29,817</td>
<td>3,171</td>
<td>1,043</td>
<td>5,888</td>
<td>19,715</td>
</tr>
<tr>
<td>2008-09</td>
<td>12,166</td>
<td>3,548</td>
<td>1,590</td>
<td>2,993</td>
<td>4,037</td>
</tr>
<tr>
<td>2010-11</td>
<td>39,693</td>
<td>5,808</td>
<td>3,291</td>
<td>10,827</td>
<td>19,767</td>
</tr>
</tbody>
</table>

| Five Season Total | 103,385 | 16,691 | 7,008  | 23,314  | 56,373|

*Final Results Aug 07, 2012.

Houston, we have a problem
Reported NNDSS pertussis cases: 1922-2012*

*2011 data are provisional; 2012 data are provisional through week 30..

SOURCE: CDC, National Notifiable Diseases Surveillance System and Supplemental Pertussis Surveillance System and 1922-1949, passive reports to the Public Health Service
Whooping cough cases reach epidemic levels in much of Washington

All teens and adults need a whooping cough booster

Since mid-2011, a substantial rise in pertussis cases has been reported in the state of Washington. In response to this increase, the Washington State Secretary of Health declared a pertussis epidemic on April 3, 2012. By June 15, the reported number of cases in Washington in 2012 had reached 2,520 (37.5 cases per 100,000 residents), a 1,300% increase compared with the same period in 2011 and the highest number of cases reported in any year since 1942. To assess clinical, epidemiologic, and laboratory factors associated with this increase, all pertussis cases reported during January 1–June 16, 2012, were reviewed. Consistent with national trends, high rates of pertussis were observed among infants aged <1 year and children aged 10 years. However, the incidence in adolescents aged 13–14 years also was increased, despite high rates of vaccination with tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis (Tdap) vaccine, suggesting early waning of immunity. The focus of prevention and control efforts is the protection of infants and others at greatest risk for severe disease and improving vaccination coverage in adolescents and adults, especially those who are pregnant. Pertussis vaccination remains the single most effective strategy for prevention of infection.

180 of 966 total cases for the year had been reported during the same period in 2011 (Figure 1). Cases were reported in 32 of the 39 counties (median: 24 cases; range: 1–485 cases). Statewide incidence was 37.5 cases per 100,000 population, ranging from 4.9 to 41.4 by county. Incidence was highest in infants aged <1 year and children aged 10, 13, and 14 years (Figure 1). Among the 1,867 cases with known race and ethnicity, statewide cumulative incidence was higher in Hispanics than non-Hispanics (55.1 versus 24.6 cases per 100,000 population). Of the 155 reported pertussis cases in infants aged <1 year, 34 (21.9%) were managed in a hospital. Among these hospitalized infants, 14 (41.2%) were aged <2 months. Of the 2,360 cases involving children aged ≥21 year with known outcome, 14 of the children (0.6%) were hospitalized. No fatalities were reported.

Compared with the incidence in Washington, the national incidence for the same period in 2012 was lower overall (4.2 cases per 100,000 population). However, the national

April 3, 2012

July 20, 2012
Maximizing the Vaccination Program

- Sustaining DTaP coverage
- Increasing Tdap coverage
- Vaccinating to protect infants
The Truth About Vaccines

Worried about autism, many parents are opting out of immunizations. How they're putting the rest of us at risk

BY ALICE PARK
You can’t handle the truth
Percent of children enrolled in kindergarten who reported exemptions* to vaccination, United States, 2011-12 school year

- Exemption status may not be mutually exclusive of vaccination status.

Source: MMWR August 24, 2012
Measles, United States, 2011
Geographic Distribution of Cases (n=222)

= 1 case
Measles Outbreaks*, United States, 2011

• 112/222 (50%) annual cases were outbreak-associated
• 17 total outbreaks
• Median outbreak size was 6 (range: 3 – 21)
• 44% of outbreak-associated cases occurred in unvaccinated philosophical belief exemptors

*Outbreak = 3 or more epidemiologically linked cases

MMWR April 20, 2012
Measles, United States, 2001-2011
Importations by WHO Region

Year

Unknown
South East Asian
Eastern Mediterranean
American
Western Pacific
European
African

Number of Cases
Measles is Epidemic in France

Measles cases per month - Mandatory reporting, France, January 2008-June 2011 (provisional data for June) / Number of measles boxes per month - Mandatory notification, France, January 2008 - June 2011 (provisional data for June)
We’ll always have Paris
Tdap, MenACWY, and HPV vaccination estimates among adolescents, 13-17 years, NIS-Teen, United States, 2006-2011
Actual and potentially achievable vaccination coverage if missed opportunities were eliminated: NIS-Teen, 2011

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Actual</th>
<th>Potentially Achievable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Td/Tdap</td>
<td>85.3</td>
<td>91.5</td>
</tr>
<tr>
<td>MenACWY Vaccine</td>
<td>70.5</td>
<td>90.9</td>
</tr>
<tr>
<td>HPV-1</td>
<td>53</td>
<td>89.5</td>
</tr>
</tbody>
</table>

Healthy People 2020 Objectives

Source: NIS Teen 2011; Slide courtesy Shannon Stokley (CDC/NCIRD/ISD)

HPV-1 coverage is among females only.
HPV Vaccine Intentions (in the Next 12 Months) Among Parents of Adolescents 13-17 Years of Age

Source: NIS-Teen
Slide courtesy Shannon Stokley, CDC
Top 5 reasons* for not vaccinating teen, among parents with no intention to vaccinate** in the next 12 months, NIS-Teen 2011

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Parents of girls</th>
<th>Parents of boys</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not needed or necessary</td>
<td>23.2%</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Not sexually active</td>
<td>19.5%</td>
<td>Not needed or necessary</td>
</tr>
<tr>
<td>Safety concern/side effects</td>
<td>19.3%</td>
<td>Lack of knowledge</td>
</tr>
<tr>
<td>Lack of knowledge</td>
<td>15.2%</td>
<td>Not sexually active</td>
</tr>
<tr>
<td>Not recommended</td>
<td>9.6%</td>
<td>Child is male</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.5%</td>
</tr>
</tbody>
</table>

*Response categories are not mutually exclusive.

**Represent ~25% of parents for parents of teens in 2011
What we have here is a failure to communicate
HPV Vaccine: A Shot of Cancer Prevention

CME/CE Medscape Education Infectious Diseases, August 10, 2012

NEWS AND FEATURES

HPV vaccine can’t wait
Immunization of younger teens is critical to preventing serious cancers later in life
Anne Schuchat, M.D. and Michael T. Brady, M.D., FAAP

Increasing HPV Vaccine Coverage Providers can take steps to ensure that cervical cancer does not develop in this generation of girls at the rates of their mothers and grandmothers.
CDC Expert Commentary, December 2011

HPV Vaccine Now Recommended for Boys and Young Men Help parents understand why boys should start the HPV vaccine series at age 11-12 years.
CDC Expert Commentary, March 2012
In-Depth HPV Vaccine/Disease Sheet

HPV

As parents, you do everything you can to protect your children’s health for now and for the future. Today, there is a strong warning to prevent several types of cancer in our kids: the HPV vaccine.

HPV and Cancer
HPV is short for Human Papillomavirus, a common virus. In the United States each year, there are about 18,000 women and 7,000 men infected with HPV-related cancers. Many of these cancers could be prevented with vaccination. In both women and men, HPV can cause cancer and mouth/throat (oropharyngeal) cancer. It can also cause cancers of the cervix, vagina and cervix in women; and cancer of the penis in men.

DISEASES and the VACCINES that prevent them

HPV vaccination is recommended for girls and boys at age 11 or 12 years
HPV vaccine is also recommended for girls ages 13 through 26 years and for boys ages 13 through 21 years, who have not yet been vaccinated. So if your son or daughter hasn’t started or finished the HPV vaccination series—it’s not too late! Talk to their doctor about getting it for them now.

The HPV vaccine is available in two different forms: Gardasil is for girls aged 13 to 26 years, and Cervarix is for girls aged 15 to 25 years. Both vaccines are given as a series of 3 doses over 6 months. The best way to remember to get your child’s 3rd dose is to make an appointment for the second and third shot before you have the doctor’s first shot.

Is the HPV vaccine safe?
Yes. Both HPV vaccines were studied in tens of thousands of people around the world. More than 46 million doses have been distributed to date, and there have been no serious safety concerns. Vaccine safety continues to be monitored by CDC and the Food and Drug Administration (FDA). These studies continue to show that HPV vaccines are safe.

HPV can cause health problems, like cancer and genital warts. Genital warts are not a life-threatening disease, but they can cause emotional stress, and their treatment can be very uncomfortable. About 1 in 100 sexually active adults in the United States have genital warts at any given time.

Why does my child need this now?
HPV vaccines offer the best protection to girls and boys who receive all three vaccine doses and have time to develop an immune response before they begin sexual activity with another person. This is not to say that your partner is ready to have sex. In fact, it’s the opposite—it’s important to get your child protected before you or your child have to think about this issue. The immune response to this vaccine is better in preteens, and this could mean better protection for your child.

Help paying for vaccines
The Vaccines for Children (VFC) program provides vaccines for children ages 18 years and younger who are under insured, not insured, Medicaid-eligible, or American Indian/Alaska Native. Learn more about the VFC program at www.cdc.gov/vaccines/programs/vfc/

More about boys?
One HPV vaccine—Gardasil—is for boys too! This vaccine can help prevent boys from getting HPV-related cancers of the mouth/throat, penis and anus. The vaccine can also help prevent genital warts. HPV vaccination of men is also likely to benefit females by reducing the spread of HPV viruses.

For more information about the vaccines recommended for preteens and teens:
800-CDC-INFO (800-232-4636)
http://www.cdc.gov/vaccines/teams

Jacquelyn’s story: “I was healthy—and got cervical cancer.”
When I was in my late 20s and early 30s, in the years before my daughter was born, I had some abnormal Pap smear results and had to have further testing. I was told I had the kind of HPV that can cause cancer and lead to death.

For more information about all of the recommended vaccines at:
www.cdc.gov/vaccines/teams

What Determines Credibility?

Low Concern Settings

- Competence/Expertise: 80-85%
- All other factors: 15-20%

Randall Hyer, National Immunization Conference, 2005
What Determines Credibility?

High Concern Settings

- Competence/Expertise: 15-20%
- Honesty/openness: 15-20%
- Listening/caring/Empathy: 50%
- All other factors: 15-20%

Randall Hyer, NIC, 2005
You had me at hello...
New Tools for Clinicians and Parents

- Provider Resources for Vaccine Conversations with Parents
  - www.cdc.gov/vaccines/conversations

- Health Care Professional Home Page
  - www.cdc.gov/vaccines/hcp

- "Get the Picture" Childhood Video
  - www.youtube.com/user/CDCStreamingHealth

- Public awareness campaign launched Niiw 2012
  - Radio, TV, print PSAs
State of IT when I got into public health...
Pay no attention to the man behind the curtain
Modernizing the Immunization Program with IT Investments

3 Focus Areas

* Barcodes
* Interoperability
* VTrckS

Doctor’s offices
E-health records

Health Departments and Immunization Information System
Estimated Return on Investment of Childhood Vaccines

- For each birth cohort vaccinated against 13 diseases in accordance with the schedule for DTaP, Hib, IPV, MMR, hep B, Varicella, Hepatitis A, Pneumo-7, and Rotavirus vaccines:
  - 42,000 lives are saved
  - 20M cases of disease are prevented
  - 13.5 billion dollars in direct costs are saved
  - 68.8 billion dollars in direct plus indirect (societal) costs are saved
  - For each dollar invested in these vaccinations, $10.20 is saved

Fangjun Zhou et al – National Immunization Conference 2011 Workshop D2
https://cdc.confex.com/cdc/nic2011/webprogram/meeting.html
Preliminary results of updated analysis from Zhou et al, Arch of Ped and Adolesc Med 2005
Desperately Seeking… a Hollywood Ending?

✓ Perfect our Partnerships
  - Clinicians, Pharmacists, Workplaces, Institutions, Public health, Health plans, Retail sites, Coalitions

✓ Strengthen our Systems
  - Immunization information systems
  - Vaccine management
  - Evidence-based performance strategies (e.g., reminder-recall, AFIX, standing orders)

✓ Communicate, Communicate, Communicate
  - Traditional and new approaches
TOMORROW IS ANOTHER DAY
I have always depended on the kindness of strangers.
Thank you