Disclosure: Session PL1

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CDC did not accept commercial support for this continuing education activity.
Finding Our Inspiration

Nancy Messonnier, MD
Director, National Center for Immunization and Respiratory Diseases

2018 National Immunization Conference
May 15, 2018
Disclosure

- I have no financial interests to disclose.
NCIRD 2018 Areas of Focus

- Maintain and strengthen domestic immunization program
- Use new technology and systems to improve availability of data
- Accelerate the development and introduction of new vaccine and new vaccine recommendations
- Improve prevention, detection, and control of respiratory diseases
- Improving influenza vaccines
I long to accomplish a great and noble task, but it is my chief duty to accomplish humble tasks as though they were great and noble. The world is moved along, not only by the mighty shoves of its heroes, but also by the aggregate of the tiny pushes of each honest worker.

- Helen Keller
Inspiration: Data
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>2017 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>122</td>
<td>&gt; 99%</td>
</tr>
<tr>
<td>Mumps</td>
<td>162,344</td>
<td>5,629</td>
<td>97%</td>
</tr>
<tr>
<td>Pertussis</td>
<td>200,752</td>
<td>15,808</td>
<td>92%</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>9</td>
<td>&gt; 99%</td>
</tr>
<tr>
<td>Congenital Rubella Syndrome</td>
<td>152</td>
<td>2</td>
<td>99%</td>
</tr>
<tr>
<td>Tetanus</td>
<td>580</td>
<td>31</td>
<td>95%</td>
</tr>
<tr>
<td><em>Haemophilus influenzae</em></td>
<td>20,000</td>
<td>22*</td>
<td>&gt; 99%</td>
</tr>
</tbody>
</table>

† JAMA. 2007;298(18):2155-2163

* *Haemophilus influenzae* type b (Hib) < 5 years of age. An additional 11 cases of Hib are estimated to have occurred among the 237 notifications of Hi (< 5 years of age) with unknown serotype.

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

Abbreviations: MMR = measles, mumps, and rubella vaccine; DTP/DTaP = diphtheria, tetanus toxoids, and pertussis vaccine / diphtheria, tetanus toxoids, and acellular pertussis vaccine; Hib = Haemophilus influenzae type b vaccine; FS = full series; HepB = hepatitis B vaccine; PCV = pneumococcal conjugate vaccine; HepA = hepatitis A vaccine

<1% of toddlers had received no vaccines
Childhood Immunization Provides Big Savings
Vaccines for Children: 23 years of protecting America’s children

CDC estimates that vaccination of children born between 1994 and 2016:

- Prevent 381 million illnesses
- Prevent 24.5 million hospitalizations
- Help avoid 855,000 early deaths
- Save nearly $360 billion in direct costs and $1.65 trillion in total society costs
- Every dollar spent in childhood vaccination ultimately saves $10.10.

Updated data from previous article: Benefits from Immunization During the Vaccines for Children Program Era – United States, 1994-2013. MMWR. 25 April 2014
Colorado Among Worst Hit States For Flu Cases

By Jancie Leary

By Jancie Leary

Severe flu in California brings medicine shortages, kills 27

HOSPITALS SWAMPED WITH FLU CASES

Alabama declares state of emergency due to widespread flu cases

WELD COUNTY, Colo. (CBS4) – The Centers for Disease Control and Prevention is now widespread in every state except Hawaii.

_season started early and is spreading fast_
Influenza Activity was Widespread for Weeks

- First time all 49 states had widespread activity in the same week; and lasted for 3 weeks
2017-18 Influenza Season Summary

- Influenza A(H3N2) viruses – usually associated with more severe seasons and reduced vaccine effectiveness – were predominant this season

- Intense, widespread and severe flu activity occurred simultaneously across the United States
  - Influenza-like illness peaked at 7.5%, the highest level recorded since the 2009 H1N1 pandemic (7.7%) and since 2010, second only to the 2003-04 season (7.6%) for a regular flu season.
  - Second wave of influenza B viruses followed
  - Hospitalization rates broke records
  - Mortality similar to the 2014-15 H3N2 “high” severity season

- Interim vaccine coverage estimates similar to past seasons (39%)
- Interim vaccine effectiveness against H3N2 similar to past H3N2 seasons, low (25%)
- Spot shortages of influenza antiviral medications
Just one of the 165 deaths from flu this year.
Pediatric Influenza-Associated Deaths by Week of Death, 2014-15 season to the present

- Half of deaths were in otherwise healthy kids
- Only 25% vaccinated
- *Pediatrics* study looking at data between 2010-14 showed vaccination reduced death by:
  - 51% among children with underlying high-risk medical conditions
  - 65% among healthy children
Improving Influenza Vaccines

Today

Tomorrow

The Future

Research

Practice

Dissemination
Early season and end-of-season flu vaccination coverage estimates, National Immunization Survey-Flu and NIFS, United States, 2013-14 flu season to November, 2017.
The flu vaccine saves lives in children.

The flu vaccine protects you and your baby.

The flu vaccine is an important part of managing your chronic disease.

The flu vaccine is part of your healthy lifestyle.
Maternal Vaccination: Vaccinate to Protect Infants

- Communication campaign – Born with Protection
- Evaluating systems barriers
  - Confidence in making recommendation
  - Stocking vaccine
  - Payment

www.cdc.gov/vaccines/pregnancy
What and from who parents want to hear information about vaccines

- Most women make decisions about childhood vaccines while they are pregnant.
- Most parents vaccinate according to the CDC recommended schedule.
- Parents’ attitudes about childhood vaccines remained consistently positive on a national level.
- Parents do have questions and concerns about vaccines, but questions do not necessarily equal concerns. Parents have questions regardless of their immunization plans.
- HCPs remain parents’ #1 trusted source of vaccine information.
- Parents value HPV vaccine more than providers think they do.
- Provider recommendation plays an important role in HPV uptake.

CDC National Poll of Parents 2016 (unpublished data)
Childhood Vaccination Coverage by Urbanicity and Poverty Status, Selected Vaccines, NIS 2016

4+DTaP Polio 1+MMR 3+HepB Varicella 4+PCV Rotavirus

MSA, Central City | MSA, non-Central City | non-MSA | At or above poverty | Below poverty

CDC Immunization Programs Addressing Disparities in Poverty

- Collaboration with 61 state and local immunization programs and more than 44,000 VFC-enrolled provider sites to implement the Vaccines For Children (VFC) Program to increase access to vaccines for eligible children
- Partnerships with state Medicaid programs to address barriers to vaccination among the Medicaid population
- Work with 3 states (LA, MI, WV) to develop hypotheses about barriers to vaccination
- Survey of Louisiana VFC vaccine coordinators to understand the association between vaccination policies/practices and vaccination coverage of children from low-income families
- Planned (2018) research to better understand the factors contributing to disparities from the parent/guardian perspective
HPV
HPV vaccination is the best way to protect children from cancers caused by HPV

*Estimated coverage with ≥1 dose of human papillomavirus (HPV) vaccine among adolescents aged 13-17 years, National Immunization Survey–Teen (NIS–Teen), United States, 2016 Source: MMWR August 25, 2017
### Estimated vaccination coverage among adolescents aged 13-17 years, NIS-Teen, United States, 2006-2016

<table>
<thead>
<tr>
<th>Routine HPV recommendation for females</th>
<th>Routine HPV recommendation for males</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥1 Tdap</td>
<td>≥1 MenACWY</td>
</tr>
<tr>
<td>≥1 HPV (F)</td>
<td>≥1 HPV (M)</td>
</tr>
<tr>
<td>≥3 HPV (F)</td>
<td>HPV UTD (F)</td>
</tr>
<tr>
<td>HPV UTD (M)</td>
<td>≥3 HPV (M)</td>
</tr>
</tbody>
</table>

UTD: Up To Date for HPV based on number of doses needed according to ACIP recommendations

#### Table

<table>
<thead>
<tr>
<th>Survey Year</th>
<th>≥1 Tdap</th>
<th>≥1 MenACWY</th>
<th>≥1 HPV (F)</th>
<th>≥1 HPV (M)</th>
<th>HPV UTD (F)</th>
<th>HPV UTD (M)</th>
<th>≥3 HPV (F)</th>
<th>≥3 HPV (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>90.0</td>
<td>88.0</td>
<td>50.0</td>
<td>8.0</td>
<td></td>
<td></td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2007</td>
<td>90.0</td>
<td>88.0</td>
<td>50.0</td>
<td>8.0</td>
<td></td>
<td></td>
<td>0.0</td>
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<tr>
<td>2008</td>
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<td>88.0</td>
<td>50.0</td>
<td>8.0</td>
<td></td>
<td></td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2009</td>
<td>90.0</td>
<td>88.0</td>
<td>50.0</td>
<td>8.0</td>
<td></td>
<td></td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2010</td>
<td>90.0</td>
<td>88.0</td>
<td>50.0</td>
<td>8.0</td>
<td></td>
<td></td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2011</td>
<td>90.0</td>
<td>88.0</td>
<td>50.0</td>
<td>8.0</td>
<td></td>
<td></td>
<td>0.0</td>
<td>0.0</td>
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<tr>
<td>2012</td>
<td>90.0</td>
<td>88.0</td>
<td>50.0</td>
<td>8.0</td>
<td></td>
<td></td>
<td>0.0</td>
<td>0.0</td>
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<tr>
<td>2013</td>
<td>90.0</td>
<td>88.0</td>
<td>50.0</td>
<td>8.0</td>
<td></td>
<td></td>
<td>0.0</td>
<td>0.0</td>
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<tr>
<td>2014</td>
<td>90.0</td>
<td>88.0</td>
<td>50.0</td>
<td>8.0</td>
<td></td>
<td></td>
<td>0.0</td>
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</tr>
<tr>
<td>2015</td>
<td>90.0</td>
<td>88.0</td>
<td>50.0</td>
<td>8.0</td>
<td></td>
<td></td>
<td>0.0</td>
<td>0.0</td>
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<tr>
<td>2016</td>
<td>90.0</td>
<td>88.0</td>
<td>50.0</td>
<td>8.0</td>
<td></td>
<td></td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Walker et al. MMWR 2017  
NIS-Teen, National Immunization Survey-Teen;  
Note: revised definition of adequate provider data in 2013
Barriers to On-Time HPV Vaccination for all Preteens

Parents

- Not receiving a healthcare professional’s strong recommendation for the HPV vaccine
- Need more information about the HPV vaccine
- May believe that their child is too young to get vaccinated for HPV
- May have concerns about vaccine adverse effects, safety, and newness
- Cost of the HPV vaccine

Healthcare Professionals

- Perceive parents’ attitudes are negative about HPV vaccine and think they have concerns
- Knowledge gaps when it comes to talking about HPV vaccine
- Inadequate insurance coverage and reimbursement
- May prefer to wait and vaccinate older vs younger adolescents
- Preference for vaccinating girls vs boys

Segment clinicians who need different messages, tools to increase HPV vaccination

Important, but we’re doing fine with coverage

Do your HPV vaccine rates show how much you care?

If not, we can help

Doctors routinely screen for cancers?

- Oropharyngeal
- Anal
- Penile

None of these. Doctors don’t screen for most HPV cancers.

Important for high-risk, but not everyone

More than 80% of people will get HPV.

Let’s vaccinate 100% of preteens.

Not important, because we have screening

Important enough to push parents

Getting parents to accept HPV vaccination on time

Can depend on how you recommend it.
I want to tell you my story...

At 44 years of age, I was diagnosed with Stage IV HPV Throat Cancer. With a wife and three children, I was determined to survive. Now I want to stop anyone else from having to go through what I did. I want to stop oral cancer now.

Jason Mendelsohn
Shingles

- Annual rate ~4 HZ cases per 1000 population – 1 million cases annually
- Incidence increases with age, ranging from <1 case/1000 children to >15 cases/1000 population 80 years and older.
- Zoster Vaccine Live (ZVL, Zostavax™) licensed in the U.S. since 2006
- Zoster Vaccine Recombinate (RZV, Shingrix®) licensed and preferentially recommended by ACIP for ≥ 50 year olds in October 2017
- High levels of demand for Shingrix® vaccine mean providers should anticipate ordering limits and intermittent shipping delays between now and the end of June 2018. GSK is working to make more doses available in order to meet the demand
Number of Reported Mumps Cases, United States, 1968-2017

National Notifiable Diseases Surveillance System (passive surveillance); 2017 data as of May 1, 2017.
# Measles Incidence Rate Per Million

## Top 10**

<table>
<thead>
<tr>
<th>Country</th>
<th>Cases</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>51626</td>
<td>38.99</td>
</tr>
<tr>
<td>Nigeria</td>
<td>10391</td>
<td>55.87</td>
</tr>
<tr>
<td>Indonesia</td>
<td>7790</td>
<td>29.83</td>
</tr>
<tr>
<td>Ukraine</td>
<td>7758</td>
<td>174.58</td>
</tr>
<tr>
<td>Pakistan</td>
<td>6151</td>
<td>31.84</td>
</tr>
<tr>
<td>China</td>
<td>5492</td>
<td>3.91</td>
</tr>
<tr>
<td>Italy</td>
<td>5041</td>
<td>84.82</td>
</tr>
<tr>
<td>Romania</td>
<td>4474</td>
<td>226.21</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>3225</td>
<td>19.79</td>
</tr>
<tr>
<td>Serbia</td>
<td>2827</td>
<td>320.52</td>
</tr>
</tbody>
</table>

## Other countries with high incidence rates***

<table>
<thead>
<tr>
<th>Country</th>
<th>Cases</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberia</td>
<td>1041</td>
<td>225.63</td>
</tr>
<tr>
<td>Gabon</td>
<td>394</td>
<td>199.01</td>
</tr>
<tr>
<td>Greece</td>
<td>1851</td>
<td>165.51</td>
</tr>
<tr>
<td>Georgia</td>
<td>379</td>
<td>96.55</td>
</tr>
<tr>
<td>Malaysia</td>
<td>2227</td>
<td>71.41</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>539</td>
<td>61.71</td>
</tr>
</tbody>
</table>

Notes: Based on data received 2018-04 and covering the period between 2017-03 and 2018-02 - Incidence: Number of cases / population* * 100,000 - * World population prospects, 2017 revision - ** Countries with the highest number of cases for the period - *** Countries with the highest incidence rates (excluding those already listen in the table above)
# Measles Outbreaks in the U.S. (2018)

<table>
<thead>
<tr>
<th>Order of Event</th>
<th>1st Onset</th>
<th>Latest Onset</th>
<th>Outbreak Name</th>
<th>State(s)</th>
<th># Cases</th>
<th>Age Range</th>
<th>Source</th>
<th>Genotype</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th</td>
<td>03/21/2018</td>
<td>04/15/2018</td>
<td>Kansas City, MO 2018</td>
<td>MO*</td>
<td>4</td>
<td>10 yrs - 41 yrs</td>
<td>Guatemala</td>
<td>D8</td>
</tr>
<tr>
<td>3rd</td>
<td>03/04/2018</td>
<td>03/31/2018</td>
<td>Santa Clara Co. CA 2018</td>
<td>CA, NV</td>
<td>7</td>
<td>4 yrs - 33 yrs</td>
<td>UK</td>
<td>D8</td>
</tr>
<tr>
<td>2nd</td>
<td>02/16/2018</td>
<td>04/12/2018</td>
<td>Johnson Co., KS 2018</td>
<td>KS*</td>
<td>18</td>
<td>6 mos - 61 yrs</td>
<td>Pakistan</td>
<td>B3</td>
</tr>
<tr>
<td>1st</td>
<td>01/09/2018</td>
<td>01/20/2018</td>
<td>Ellis Co., TX 2018</td>
<td>TX</td>
<td>6</td>
<td>8 mos - 27 yrs</td>
<td>Uganda</td>
<td>B3</td>
</tr>
</tbody>
</table>

* ongoing
Improving the Accessibility of our Data and Materials

- Updated vaccine schedules app for clinicians and other immunization providers
- ACIP will be working on improving the homepage for the immunization schedules so links are more clear and available digitally
- Digital First Initiative
- Improving the accessibility of our on line data
- Reviewing on line reports and other resources
Vaccination sources send vaccine records to state or city IIS

IISs provide records to patients and authorized professionals

- Parents and general public
- Public health
- Doctors and healthcare providers
NIC 2018: What to watch out for

- Look for new ideas to be more effective in your work in sessions that are aligned with your specific responsibilities
- Attend a couple of sessions in something you don’t know anything about to broaden your understanding and potentially see synergy that you wouldn’t have seen otherwise
- Connect with colleagues and explore with them solutions to challenges they are currently facing
- Make new connections with people who work in different areas