Challenges 2012:
Diseases, vaccines, exemptions

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More than 10 million children under age 5 yrs die each year from infection.
Number of Reported Measles Cases with onset date from Dec 2010 to Jun 2011

Data source: surveillance DEF file
Data in HQ as of 7 July 2011

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.
Measles global annual reported cases and MCV coverage, 1980-2009

Number of cases

Official coverage

WHO/UNICEF estimates
*30,000 cases in Nigeria in the first part of 2011
*Dem Rep of Congo had 17,000 cases in 2 months
Measles—United States, 1950-2001

Cases (thousands)


Vaccine Licensed
Measles–United States, 2011

• More than 200 cases

• Of 224 cases:
  – 57% unvaccinated
  – 16% had undocumented vaccine history
  – 87% imported
    • From where?
  – 71% of these cases were in U.S. residents
    • 85% of the U.S. residents were NOT vaccinated

• National teen coverage with measles containing vaccine approaches 90%

• There continues to be pockets of unimmunized children
Recent History with measles in the U.S.
October 2011

- Borough Park, NY
  - Orthodox community
  - Historically vaccine hesitant population
- 3 cases in children under 2 yrs
  - No MMRs
- 3 secondary cases
  - One exposure occurred in a provider office waiting room
Measles in the U.S. Jan-May 2011

N=118

20 cases imported from Europe

- Import associated
- Unknown source
Mumps Resurgence

• 2005: 31 campers downstate NY
• 2006: 6,584 cases, hub in Midwest
• 2009-10: NYC, NJ, Quebec
  – More than 1600 cases
  – 95%+ in Hasidic Jewish communities
  – 70% males (5% incidence of orchitis)
  – Insular population, dense living conditions, and dense educational conditions
Bottom line

- Measles and mumps still circulate
- Pockets of unimmunized individuals will result in outbreaks
- Sizable outbreaks also occurring in France, U.K., Switzerland, Italy, Austria among vaccine refusers
- Regional and local pockets of sagging immunization rates no longer escape disease outbreaks
Vaccine exemptions by state

- States allowing religious exemptions: AK, CA, CO, ID, IN, KS, LA, ME, MD, MI, MN, MO, MT, NE, NH, NJ, NM, NY, OR, PA, RI, SD, TN, TX, UT, VA, WA, WY
- States allowing medical exemptions only: MS
- States allowing personal belief exemptions: AL, AZ, AR, FL, GA, HI, IL, IA, KS, KY, LA, MD, MA, ME, MI, MN, MO, MT, NE, NV, NJ, NY, NC, ND, OH, OK, OR, PA, RI, SC, SD, TN, TX, UT, VA, WA, WV, WI, WY
Figure 3. Number of reported pertussis cases by year of onset -- California, 1947-2011*

Previous peak in 1947
number of cases: 9,394

Previous peak in 1958
incidence: 26.0/100,000

9,143 cases

23.4/100,000

*As of 8/10/2011
California pertussis outbreak

- **2010**: 9143 cases, highest since 1947 (9394)
  - 805 hospitalizations (9%), half in infants under 3 mos and 72% less than 6 mos
  - 10 deaths, all ≤ 2 mos

- **2011**: 2164 cases
  - 134 hospitalized (9%): 68% under 3 mos of age
  - No deaths

- Ongoing problems in Washington, Wisconsin, Texas, Ohio, PA, NJ and elsewhere
Number of Pertussis Cases Reported in WA State by Notification Week
2011 vs. 2012 YTD (5/12/12)

Additional cases may have occurred, especially in the most recent three weeks, that are not yet available to DOH.
WA State Pertussis Cases Reported by Month and Year with Projected Baseline and Epidemic Thresholds 2005-2011 and 2012 YTD (through March)

*The highest 5% of monthly data values were excluded when projecting the baseline.
Current States

• Washington: Emergency
  – 1484 cases in 2012 so far
    • 134 cases in 2011
  – 22/100,000

• Wisconsin: Widespread outbreaks
  – 1900 cases in 2012
    • 158 cases in 2011
Vaccine exemptions by state

- **Purple**: States allowing religious exemptions
- **Gray**: States allowing medical exemptions only
- **Green**: States allowing personal belief exemptions
Measles in the U.S. Jan-May 2011

20 cases imported from Europe!

N=118

- Import associated
- Unknown source

20 cases imported from Europe
New York State

- Recent impact from measles, mumps, and pertussis
- Yet no PBE is allowed
- How is NY doing with vaccine coverage?
Vaccination Rates for New York

- 4:3:1
- 4:3:1:3
- 4:3:1:3:3
- 4:3:1:3:3:1
- 4:3:1:3:3:1:4
- 4 DTP
- 3 Polio
- 1 MMR
- 3 Hib
- 3 HepB
- 1 Var
- 4 PCV
Vaccination Rates for New York

- 4 DTP
- 3 Polio
- 1 MMR
- 3 Hib
- 3 HepB
- 1 Var
- 4 PCV

Year: 1995 to 2010
Percent (%): 0 to 100

Graph showing vaccination rates for various vaccines over the years.
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<tbody>
<tr>
<td><strong>DTaP</strong></td>
<td>80.5</td>
<td>87.3</td>
<td>82.6</td>
<td>89.2</td>
<td>87.2</td>
<td>82.5</td>
<td>87.4</td>
<td>85.4</td>
<td>87.7</td>
<td>86.5</td>
<td>89.0</td>
<td>87.3</td>
<td>88.9</td>
<td>84.4</td>
<td>84.0</td>
<td>80.0</td>
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<td><strong>polio</strong></td>
<td>90.8</td>
<td>93.5</td>
<td>90.7</td>
<td>92.6</td>
<td>91.4</td>
<td>89.6</td>
<td>91.0</td>
<td>91.3</td>
<td>92.5</td>
<td>92.0</td>
<td>93.5</td>
<td>93.6</td>
<td>94.6</td>
<td>92.8</td>
<td>90.9</td>
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<tr>
<td><strong>MMR</strong></td>
<td>91.2</td>
<td>95.1</td>
<td>92.5</td>
<td>95.1</td>
<td>94.9</td>
<td>94.1</td>
<td>92.5</td>
<td>94.4</td>
<td>95.1</td>
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<td>93.6</td>
<td>92.2</td>
<td>90.3</td>
<td>89.3</td>
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<tr>
<td><strong>Hib</strong></td>
<td>93.2</td>
<td>92.5</td>
<td>92.8</td>
<td>94.6</td>
<td>94.4</td>
<td>92.9</td>
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<td>92.5</td>
<td>91.0</td>
<td>92.5</td>
<td>88.7</td>
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<tr>
<td><strong>HepB</strong></td>
<td>78.3</td>
<td>85.4</td>
<td>87.6</td>
<td>91.2</td>
<td>92.9</td>
<td>91.7</td>
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<td>93.5</td>
<td>92.7</td>
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<td>90.9</td>
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<tr>
<td><strong>Var</strong></td>
<td>12.4</td>
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<td>46.1</td>
<td>59.2</td>
<td>70.6</td>
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<td><strong>PCV</strong></td>
<td>55.1</td>
<td>72.3</td>
<td>75.1</td>
<td>80.2</td>
<td>80.1</td>
<td>72.8</td>
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<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Peak %</th>
<th>2010 %</th>
<th>Change</th>
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<tr>
<td>DTaP</td>
<td>89.2</td>
<td>80.0</td>
<td>-9.2%</td>
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<tr>
<td>polio</td>
<td>94.6</td>
<td>90.9</td>
<td>-3.7%</td>
</tr>
<tr>
<td>MMR</td>
<td>95.9</td>
<td>89.3</td>
<td>-6.6%</td>
</tr>
<tr>
<td>HIB</td>
<td>96.2</td>
<td>88.7</td>
<td>-7.5%</td>
</tr>
<tr>
<td>HepB</td>
<td>95.4</td>
<td>90.9</td>
<td>-4.5%</td>
</tr>
<tr>
<td>Varicella</td>
<td>89.5</td>
<td>86.0</td>
<td>-3.5%</td>
</tr>
<tr>
<td>PCV</td>
<td>80.2</td>
<td>72.8</td>
<td>-7.4%</td>
</tr>
</tbody>
</table>
Vaccination Coverage in School-Aged Children in New York

- DTP
- Polio
- MMR
- Hib
- HepB
- Var
- PCV

Year:
- 2006
- 2007
- 2008
- 2009
- 2010

Percent (%): 100.0 to 45.0

Required vaccines coverage trends from 2006 to 2010.
Is a NY Public Health Law allowing personal belief exemptions for school attendance in the best interest of public health?
PBE in NYS?

• A PBE bill was put to vote and PASSED in the Assembly in 2011
• Members of the NYS Immunization Advisory Council met with Assemblyman Gottfried, head of the Health Committee to discuss his rationale
• We then met with Senator Hannan, head of the Senate Health Committee
  – The bill did not leave his committee
  – No Senate vote
Public confidence in vaccines is low…
Vaccines are NOT mandatory.
Idaho Code 39-4804

VaccineTruth.com

NO SHOTS. NO SCHOOL - NOT TRUE!
YOU CAN OPT OUT IN TEXAS
INFO AT VAXTRUTH.BLOGSPOT.COM
Vaccines, Eds Plotkin, Orenstein and Offit. 5th edition
Waning public confidence in vaccines has consequences

What can we do about it?
Suggestions

- Invest more in public awareness
- Educate the public on the composition of the advisory bodies
- Engage parent groups as advocates
- Avoid hyperbolic marketing practices
- Improve communication skills of our leaders
  - Be available and candid
- Stay current and accurate
- Provide a clear, consistent message to our colleagues, our students, our families, and our patients
- Engage religious leaders
  - None of the major organized religions advise against vaccines
- Start vaccinating in the newborn nursery
- Engage combination vaccines
Discussion
Haemophilus influenzae B

1st: the global look at vaccine uptake
Regional Hib3 Coverage, 1990-2009

193 WHO Member States. Date of slide: 20 October 2010
160 countries Introduced Hib vaccine
Countries having introduced Hib vaccine and infant Hib coverage, 2009

(160 countries introduced in infant immunization schedule)

- **Hib3 ≥ 80% (119 countries or 62%)**
- **Hib3 < 80% (32 countries or 16%)**
- **Hib vaccine introduced but no coverage data reported (9 countries or 5%)**
- **Hib vaccine not introduced (33 countries or 17%)**

Date of slide: 27 July 2010
Countries having introduced Hib vaccine in 1997 and 2008

1997
- 29 countries introduced
- 2 countries partially introduced

2008
- 133 countries introduced
- 3 countries partially introduced

Date of slide: 27 July 2009
So Globally…

• This is rather substantial progress

• Should we be concerned that the infection could
Recent vaccine shortage

- Serious HIB vaccine shortage continued from late 2007 to late 2009
- Most infants still received their primary series of vaccine
- Formal CDC recommendations were to defer the booster dose
2009

- Feb 2009: 5 cases of invasive HIB disease reported from Minnesota
  - 3 were in children whose parents refused vaccines, one died
  - 2 cases in Oklahoma
- March 2009: Philadelphia Dept of Health reports 7 cases. All were un (or under) immunized. Three died.
- April 2009: Hib death in NJ.
HIB disease in NYS

• 4 cases in 2008 (Erie, Allegheny and Cattaraugus Counties)
• 2 died
• In every case, the parents declined vaccines

• We have only had one case a year since 2003.
Bad combination, serious consequences

• We were not boosting from 2007-2009 so while invasive infection rates did not increase substantially, nasopharyngeal carriage of HIB probably did.

• Unimmunized infants (age, parental refusal) were more likely to come in to contact with a NP carrier.
Unsung benefits of conjugate vaccines

- Herd immunity via a decrease in carriage among the population
- Leads to decrease in frequency of exposure
- Everyone benefits, immunized or not
- An inability to boost immunity for more than a year likely resulted in increased nasopharyngeal carriage
- And...more opportunities for the unimmunized to get exposed and infected
- The shortage is over, vaccine is plentiful