Adult Vaccination Update

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2015 National Adult and Influenza Immunization Summit
May 12, 2015

Overview of Presentation

- Non – influenza adult vaccination coverage
  - Data source
  - Coverage by age group, race/ethnicity, vaccination indication
  - Limitations
  - Conclusions

- Information Sources
Data Source
National Health Interview Survey, 2013

- Annual in-home survey of U.S. non-institutionalized civilian population
- Detailed health survey of one adult per family in each household sampled
- Provides national coverage estimates
- Final sample of adult component:
  - Response rate: 61%
  - N = 34,227

National Health Interview Survey, 2013 Vaccination Questions

- Influenza (not reported here)
- PPSV or PCV13, Td/Tdap, HepA, HepB, Zoster, HPV
  - Proportion of pneumococcal vaccination by type not measured
- High-risk status
  - Limited information collected for Hep A and Hep B
    - Hep A (travel status & chronic liver disease)
    - Hep B (travel status, chronic liver disease, & diabetes mellitus)
  - PPSV or PCV13
- Health Care Personnel (HCP)
Definition of High-Risk for Pneumococcal Disease

- Adults were considered at high risk for pneumococcal disease if they had been told by a doctor or other health care professional that they:
  - Ever had:
    - Diabetes Mellitus
    - Emphysema
    - Coronary Heart Disease, Angina, Heart Attack, or other Heart Condition
    - Lymphoma, Leukemia, or Blood Cancer
  - Had during the preceding 12 months:
    - Cancer Diagnosis (excluding non-melanoma skin cancer)
    - Asthma Episode or Attack
    - Chronic Bronchitis
    - Weak or Failing Kidneys
- Or were Current Smokers

Adult Vaccination Coverage, Selected Vaccines by Age and High-risk Status, United States

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Age Group</th>
<th>% Vaccinated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumococcal, HR 19-64yrs</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td>Pneumococcal, ≥65 yrs</td>
<td></td>
<td>60</td>
</tr>
<tr>
<td>Herpes Zoster (Shingles), ≥60 yrs</td>
<td></td>
<td>24 (+41)</td>
</tr>
</tbody>
</table>

HP2020 Targets: 60% PPV HR 19-64 years, 90% PPV ≥65 years, 30% Shingles
Data Source: 2013 NHIS
Adult Tetanus-containing Vaccination Coverage by Age and High-risk Status, United States

- Td past 10 yrs, 19-49 yrs: 63%
- Td past 10 yrs, 50-64 yrs: 64%
- Td past 10 yrs, ≥65 yrs: 56%
- Tdap past 8 yrs, ≥19 yrs: 17% (+2.9%)
- Tdap past 8 yrs, Living with infant <1 yr, ≥ 19 yrs: 29%
- Tdap past 8 yrs, HCP ≥19 yrs: 37% (+5.9%)

Data Source: 2013 NHIS

Potential for Bias in Tdap Estimates

- 34% of respondents were excluded
  **Those:**
  - without a “yes” or “no” response for tetanus vaccination, past 10 years (5%)
  - without a response to tetanus vaccination during 2005-2013 (4%)
  - who reported tetanus vaccination but not told (21%) or did not know the vaccine type (4%)

- Sensitivity analysis to assess magnitude of bias -- Tdap coverage could range from: 13%-42% (adults 19-64 years); 9%-35% (adults ≥65 years)

Data Source: 2013 NHIS
Proportion of adults ≥19 years of age who received Tdap vaccine

<table>
<thead>
<tr>
<th>Group</th>
<th>Not Told (%)</th>
<th>Not Recall (%)</th>
<th>Tdap/Td+Tdap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults, ≥19 years, Overall</td>
<td>51</td>
<td>11</td>
<td>68</td>
</tr>
<tr>
<td>HCP, ≥19 years</td>
<td>31</td>
<td>8</td>
<td>77*</td>
</tr>
<tr>
<td>Non-HCP, ≥19 years</td>
<td>54</td>
<td>11</td>
<td>67</td>
</tr>
</tbody>
</table>

*p<0.05 by T test for comparisons between HCP and non-HCP ≥19 years.

Data Source: 2013 NHIS

Hepatitis A Vaccination Coverage by Age and High-risk Status, United States

- HepA (≥2 doses), ≥19 yrs: 9%
- HepA (≥2 doses), Travel Endemic Area: 16%
- HepA (≥2 doses), No Endemic Area Travel: 6%
- HepA (≥2 doses), Chronic Liver Disease: 13%
- HepA (≥2 doses), 19-49 yrs: 12%

Data Source: 2013 NHIS
Hepatitis B Vaccination Coverage by Age and High-risk Status, United States

- HepB (≥3 doses), ≥19 yrs: 25% (2.1)
- HepB (≥3 doses), Travel Endemic Area: 33%
- HepB (≥3 doses), No Endemic Area: 21% (2.3)
- HepB (≥3 doses), Chronic Liver Disease: 34%
- HepB (≥3 doses), HCP ≥19 yrs: 62%
- HepB (≥3 doses), 19-49 yrs: 33% (2.6)
- HepB (≥3 doses), Diabetes 19-59 yrs: 26%
- HepB (≥3 doses), Diabetes ≥60 yrs: 14%

HP2020 Target: 90% HepB Healthcare Personnel (HCP)
Data Source: 2013 NHIS

HPV Vaccination Coverage (≥1 dose ever), Adults 19-26 years of age by Sex, United States

- Females 19-26 yrs: 37%
- Females 19-21 yrs: 45%
- Females 22-26 yrs: 32%
- Males 19-26 yrs: 6% (+3.6)
- Males 19-21 yrs: 8% (+5.3)
- Males 22-26 yrs: 5% (+2.7)

Data Source: 2013 NHIS
**Age at First Dose of HPV Vaccination, Among Adults 19-26 years, NHIS 2013 – United States**

<table>
<thead>
<tr>
<th>Age at First Dose</th>
<th>Women (%)</th>
<th>Men (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-10</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>11-12</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>13-17</td>
<td>53</td>
<td>37</td>
</tr>
<tr>
<td>18</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>19-26</td>
<td>28</td>
<td>26</td>
</tr>
</tbody>
</table>

**Non-Influenza Adult Vaccination Coverage Rate Increases from 2012 to 2013**

- HPV (≥1 dose), Men 19-26 yrs: 3.6% → 6%
- Tdap, HCP ≥19 yrs: 2.9% → 4.1%
- Herpes Zoster, ≥60 yrs: 37%
- Tdap, ≥19 yrs: 17%

Data Source: NHIS 2012-2013
Racial/Ethnic Vaccination Disparities

<table>
<thead>
<tr>
<th>Vaccination Group</th>
<th>% Vaccinated</th>
<th>Disparity, Whites</th>
<th>Disparity, Blacks</th>
<th>Disparity, Hispanics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumo., HR 19-64 yrs</td>
<td>22</td>
<td>-1</td>
<td>-4</td>
<td>-11</td>
</tr>
<tr>
<td>Pneumo., ≥65 yrs</td>
<td>64</td>
<td>-15</td>
<td>-24</td>
<td>-18</td>
</tr>
<tr>
<td>Tetanus, 19-49 yrs</td>
<td>69</td>
<td>-15</td>
<td>-17</td>
<td>-16</td>
</tr>
<tr>
<td>Tetanus, 50-64 yrs</td>
<td>67</td>
<td>-13</td>
<td>-12</td>
<td>-14</td>
</tr>
<tr>
<td>Tetanus, ≥65 yrs</td>
<td>60</td>
<td>-19</td>
<td>-14</td>
<td>-17</td>
</tr>
<tr>
<td>Tdap, ≥19 yrs</td>
<td>20</td>
<td>-7</td>
<td>-10</td>
<td>-4</td>
</tr>
<tr>
<td>Tdap, 19-64 yrs</td>
<td>22</td>
<td>-8</td>
<td>-11</td>
<td>-5</td>
</tr>
<tr>
<td>Tdap, ≥65 yrs</td>
<td>13</td>
<td>-7</td>
<td>-6</td>
<td>-2</td>
</tr>
<tr>
<td>HepA, 19-49 yrs</td>
<td>13</td>
<td>-2</td>
<td>-2</td>
<td>+3</td>
</tr>
<tr>
<td>HepB, 19-49 yrs</td>
<td>35</td>
<td>-5</td>
<td>-12</td>
<td>+4</td>
</tr>
<tr>
<td>Herpes Zoster, ≥60 yrs</td>
<td>27</td>
<td>-17</td>
<td>-18</td>
<td>-5</td>
</tr>
<tr>
<td>HPV, Females 19-26 yrs</td>
<td>42</td>
<td>-11</td>
<td>-11</td>
<td>-22</td>
</tr>
<tr>
<td>Tdap, HCP ≥19 yrs</td>
<td>40</td>
<td>-8</td>
<td>-10</td>
<td>-7</td>
</tr>
<tr>
<td>HepB, HCP ≥19 yrs</td>
<td>63</td>
<td>-4</td>
<td>-9</td>
<td>+6</td>
</tr>
</tbody>
</table>

Racial/Ethnic Vaccination Disparities -- NHIS 2013

Compared with 2012, racial/ethnic differences persisted for all six and widened for Tdap and herpes zoster:

- **Non-Hispanic blacks, Hispanics, and Non-Hispanic Asians** had lower vaccination coverage than that of non-Hispanic whites for all of the vaccines routinely recommended for adults, except for:
  - **PPSV/PCV13 19-64-HR** -- Blacks had coverage similar to whites
  - **Tdap 65+** -- Asians had coverage similar to whites
  - **Hep A 19-49** – Blacks had coverage similar to and Asians had coverage higher than whites
  - **Hep B 19-49** – Asians had coverage higher than whites
  - **Herpes zoster 60+** – Asians had coverage similar to whites

- **Health Care Personnel (HCP)** – Non-Hispanic black and Hispanic HCP had lower coverage than white HCP for Tdap, and Hispanic HCP had lower coverage than white HCP for Hep B.
Limitations of Findings

- NHIS excludes persons in the military and those residing in institutions – results apply to the civilian, non-institutionalized population
- Response rate 61.2% -- low response rate can result in sampling bias if the nonresponse is unequal among participants regarding vaccination
- Reported vaccination status and high-risk conditions not validated by medical records
- Self-report of vaccination subject to recall bias
- Tdap estimates: potential bias due to exclusions

Conclusions

- Overall coverage remains below HP2020 targets
  - 90% for 65+ years for pneumococcal vaccine
  - 60% for high risk 19-64 years for pneumococcal vaccine
  - 30% for 60+ years for Zoster vaccine
  - 90% for hepatitis B vaccine for healthcare personnel
- Some improvement from 2012
  - Modest increases for HPV (men, 19-26), Tdap (≥19 year olds), and herpes zoster (≥60 year olds) vaccines
  - No improvements for other vaccines
- Racial and ethnic disparities remain
- Much remains to be done to increase vaccine utilization among adults and to eliminate disparities
Collaborators

- Peng-Jun Lu, MD, PhD
- Alissa O’Halloran, MSPH
- Carolyn B. Bridges, MD
- David K. Kim, MD
- Tamara Pilishvili, MPH
- Craig M. Hales, MD
- Lauri E. Markowitz, MD
- Walter W. Williams, MD

For Additional Information:

ACIP Recommendations for Specific Vaccines
- [http://www.cdc.gov/vaccines/hcp/acip-recs/index.html](http://www.cdc.gov/vaccines/hcp/acip-recs/index.html)

Non-influenza Adult Vaccination Coverage
- [http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6404a6.htm?s_cid=mm6404a6_e](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6404a6.htm?s_cid=mm6404a6_e)
Preview of Nursing Home Coverage Data

Pneumococcal vaccination coverage among US nursing home residents, 2006-2013

- Source: Minimum Data Set, Centers for Medicare & Medicaid Services