The adult immunization landscape has changed significantly with the introduction of several new vaccines targeting adults.

Participants at the 2012 National Adult Influenza and Immunization Summit recommended a study to assess the feasibility of implementing adult immunization composite measures to include all recommended adult vaccines.
Why a Composite Measure?

- Provides a broad perspective on the system of vaccination at a facility
  - Rather than a campaign to increase coverage with one vaccine, encourages a systematic approach for all vaccines
- Multiple measures make it challenging to implement broad-based immunization quality improvement activities
- “Composite measures can enhance measurement to extend beyond tracking performance on separate measures and can provide a potentially deeper view of the reliability of the care system” – Institute of Medicine, Performance Measurement: Accelerating Improvement, Washington, DC: National Academies Press; 2006

Objectives

- Assess the technical feasibility of developing an adult immunization composite measure using electronic health record data
- Define, test, and validate composite immunization measures
- Provide recommendations on the feasibility and utility of an immunization composite measure for quality improvement initiatives
IHS

- The Indian Health Service is the federal healthcare provider for eligible American Indian/Alaska Native patients
  - 44 Hospitals, 296 outpatient health centers, and 272 Alaska village clinics and health stations in 35 states
  - Service population – 1.8 million
- Serves all ages
- Computerized medical record data

VA

- The Veterans Health Administration (VHA) is the healthcare arm of the Department of Veterans Affairs
  - 151 hospitals and 825 Community Based Outpatient Clinics (CBOCs) in FY 2012
  - 6.333 million unique patients served by VHA in FY 2012
- Serves eligible Veterans in all 50 states plus Puerto Rico, Guam, and the Philippines
- Computerized medical record data
Methods

- Data Source: Electronic health record data from the IHS and VA
- Population:
  - Patients 19 years or older as of July 1st 2012 with at least one visit to an IHS/VA healthcare facility between July 1st, 2012 and June 30th, 2013.
  - Limited to IHS/VA facilities in the states of WA, OR and ID
- Vaccines:
  - Limited to those routinely recommended for adults (not catch up vaccines or vaccines based on risk)
  - Composite measure based on receipt of ALL recommended vaccines
- IHS and VA conducted separate analyses on their respective data

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Adult Immunization Measures

<table>
<thead>
<tr>
<th>Age Groups</th>
<th>Recommended vaccines</th>
<th>Composite Measure Vaccines</th>
</tr>
</thead>
<tbody>
<tr>
<td>19–59 years</td>
<td>Td in last 10 years, Tdap, and Influenza</td>
<td>Tdap and Influenza*</td>
</tr>
<tr>
<td>60–64 years</td>
<td>Td in last 10 years, Tdap, Influenza, and Zoster</td>
<td>Tdap, Influenza*, and Zoster</td>
</tr>
<tr>
<td>65 years and older</td>
<td>Td in last 10 years, Tdap, Influenza, Zoster, and Pneumococcal Polysaccharide Vaccine, 23–Valent (PPSV23)</td>
<td>Tdap, Influenza*, Zoster, and Pneumococcal polysaccharide 23 valent (PPSV23)</td>
</tr>
<tr>
<td>All Ages</td>
<td>All age-appropriate vaccines</td>
<td>Vaccination with all age-appropriate vaccines</td>
</tr>
</tbody>
</table>

* Influenza vaccine for the 2012/2013 influenza season
## Vaccine Codes – CVX and CPT

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>CVX Code</th>
<th>CPT Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tdap</td>
<td>115</td>
<td>90715</td>
</tr>
<tr>
<td>Zoster</td>
<td>121 – Zoster vaccine, live</td>
<td>90736</td>
</tr>
<tr>
<td>Pneumococcal Polysacchride, 23–Valent (PPSV23)</td>
<td>33 – PPSV23 – 33 , 109 – Pneumococcal , not otherwise specified , 100 – Pneumococcal Conjugate Vaccine (7 valent) , 133 – Pneumococcal Conjugate Vaccine (13 valent) , 152 – Pneumococcal Conjugate Vaccine, unspecified</td>
<td>90669, 90670, 90732, G0009, G8115, 90732</td>
</tr>
</tbody>
</table>

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**VA Methods and Results**

Jane Kim, MD, MPH  
Deputy Chief Consultant for Preventive Medicine  
VHA National Center for Health Promotion and Disease Prevention
VA Methods

- All patients – any patient with any electronic or face to face visit in the study period
- Primary care patients – patients who had an electronic or face to face visit to one of the VA-designated “Patient Aligned Care Teams (PACT)” in its Patient Care Management Module (PCMM)
- Used three separate databases to identify immunization data

VA Summary

- Different outcomes depending on which database used
- Immunization coding not standardized across VA
- Immunizations can be charted within the text of the electronic note and not captured in data extract (especially immunizations received outside VA)
- Ability to do data verification with chart reviews not available for this project
Next Steps – VA

- Continue transition to CVX codes
- Continue immunization projects to standardize documentation across VA system
- Continue immunization projects to share data with other immunization registries
- Chart reviews for validation of data results for the Adult Immunization Composite project

IHS Methods and Results

Amy Groom, MPH
IHS Immunization Program Manager/CDC Public Health Advisor
IHS Division of Epidemiology and Disease Prevention
IHS Methods

- All patients – any patient with any visit in the study period
- Primary care patients – patients who had a visit to one of the IHS designated “primary care clinics”
  - Excludes ER, Eye, Dental, Audiology, Mental Health, Pharmacy, etc.

IHS Results

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Patient Status</th>
<th>Total Patients # (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>19–59 years</td>
<td>Primary care</td>
<td>38,939 (73%)</td>
</tr>
<tr>
<td></td>
<td>Non–Primary</td>
<td>14,137 (27%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>53,076</td>
</tr>
<tr>
<td>60–64 years</td>
<td>Primary care</td>
<td>3,239 (78%)</td>
</tr>
<tr>
<td></td>
<td>Non–Primary</td>
<td>893 (22%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>4,132</td>
</tr>
<tr>
<td>65+ years</td>
<td>Primary care</td>
<td>5,389 (77%)</td>
</tr>
<tr>
<td></td>
<td>Non–Primary</td>
<td>1,642 (23%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>7,031</td>
</tr>
<tr>
<td>All Ages</td>
<td>Primary care</td>
<td>47,567 (74%)</td>
</tr>
<tr>
<td></td>
<td>Non–Primary</td>
<td>16,672 (26%)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>64,239</td>
</tr>
</tbody>
</table>
Coverage among Primary Care patients was significantly higher in all age groups.

IHS Summary

- Relatively high coverage with Tdap, Zoster and PPSV23 vaccines compared to the general U.S. population
  - Use of provider reminders in EHR
- Coverage with influenza, however, remains lower than coverage reported for the general U.S. population
  - Differences in methodology – self report vs. administered
  - Missing data – influenza vaccine available at other venues
- High coverage with individual vaccines does not necessarily translate to high coverage with composite measure
  - Composite measure coverage for all ages 24%
- Higher vaccine coverage among primary care patients than non-primary care patients
Next Steps – IHS

- Assess usefulness of composite measure as a performance measure
  - Pilot to implement, evaluate usefulness at small sample of sites
  - Inclusion of developmental adult composite measure into IHS performance measures software
    - Data from all IHS sites

- Comparison with other preventive measures
  - HIV screening, depression screening, cervical cancer screening, colorectal cancer screening

- Explore other ways to ‘score’ the composite measure

- Continue efforts to incorporate adult immunization data into data exchanges with state immunization registries

Challenges and Issues

- Documentation of vaccines in the EHR
  - Free text vs. standardized code set (e.g. CVX)

- Missing data
  - Vaccines received outside the system not necessarily captured in the EHR
    - Influenza

- Defining the denominator
  - All patients? Primary care patients?

- Scoring of the composite measure
  - All or nothing? Partial credit? Weighting of vaccines?

- Composite measure does not replace need for data on individual vaccine coverage
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