The Immunization Information System (IIS) Landscape

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CDC NCIRD/ISD/IISB
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Agenda

- IIS, Provider Value, and “Meaningful Use”
- CDSi and Adults
- Questions and discussion
IIS... are confidential, population-based, computerized databases that record all immunization doses administered by participating providers to persons residing within a given jurisdiction.

- Confidential
- Population-based
- Identify pockets of need
- Exchange data with multiple providers
- Assist schools & child care providers
- Help improve vaccination rates & Reduce vaccine-preventable disease

Slide Courtesy of American Immunization Registry Association (AIRA)
Where are IIS located?

- All but one state operate an IIS
- IIS are also in:
  - New York City
  - Philadelphia
  - San Antonio
  - Washington D.C.
  - San Diego
  - Imperial County
  - San Joaquin County (RIDE)
  - American Samoa
  - Guam
  - Marshall Islands
  - Micronesia
  - North Mariana Islands
  - Palau
  - Puerto Rico
  - U.S. Virgin Islands

IIS Capture the vaccination status of the population

- Children <6: 95% in 2017 vs. 82% in 2010
- Adolescents 11-17: 79% in 2017 vs. 60% in 2010
- Adults: 51% in 2017 vs. 22% in 2010

IISAR: https://www.cdc.gov/vaccines programs/iis/iisar/rates-maps-table.html
Maturity

- Each system operates independently
- Newest IIS is planning to launch in late 2019
- Oldest have been in existence for 30+ years

IIS...

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- Help improve vaccination rates & Reduce vaccine-preventable disease

- Create comprehensive records
- Assist with clinical decision support & forecasting
- Generate reminders to ensure on-time vaccinations
- Create consolidated reports
- Assist with vaccine ordering & inventory management
- Exchange data with disease surveillance & outbreak response

Slide Courtesy of American Immunization Registry Association (AIRA)
EHR-IIS Query: Access at the Point of Care

- The vast majority of IIS have query/response capabilities
- In New York City alone (population 8.5 million):
  - 1,314 clinic sites querying
  - NYC Citywide Immunization Registry receives >2.2 million queries/month

Slide Courtesy of American Immunization Registry Association (AIRA)

Drilling Down on EHR-IIS Query – Why Is It Important?

A 2016 study in the journal Pediatrics demonstrated an increase in up-to-date status and a decrease in missed opportunities following implementation of query

Stockwell et al., Pediatrics, 2016
Incentive Programs

Major requirements of “Promoting Interoperability”

- Submission
  - EHR is able to submit immunizations to an IIS

- Query/Response
  - Query IIS for patient within EHR
  - IIS returns a patient, consolidated immunization history, and clinical decision support
  - EHR user is able to reconcile IIS response

“Our best defense against missed immunization opportunities is the ability to conduct an Immunization Query. Our bi-directional interface with our state immunization database has put accurate immunization history and the current CDC recommendations based on that history at our clinicians fingertips.”

Nurse, EHR Analyst | Las Vegas, Nevada

IIS Background Takeaways

- IIS are well populated and continue to grow with your help through well documented vaccination records
- This has strengthened IISs as important analytic tools that support a wealth of population health needs
- Providers can access these data through EHR query at the point of care, supporting clinical decisions, ensuring appropriate immunization, and lowering burden
- While progress to improve interoperability and data quality has been made, collaboration between the EHR and IIS communities is key for continued improvement

CDSi and Adults

Clinical Decision Support for Immunization
Before CDSi

ACIP Recommendations with Communication and Education Branch (CEB) Clarifications

System A
System B
System C

System C Recommendation
System B Recommendation
System A Recommendation

Individual Interpretation and Implementation

With CDSi

ACIP Recommendations with Communication and Education Branch (CEB) Clarifications

CDSi Resources

Individual Implementation

Consistent System Recommendations

Workgroup Interpretation and Documentation

CDSi Resources
CDSi and Adults

The “Easy”

- Routine Recommendations
  - Flu
  - Zoster
  - Td(ap)
  - Pneumococcal
- Increased Risk Schedules

The “Not-so-Easy”

- Mapping ACIP Risks to IT Codes
- Varied Language across MMWRs
- Risks not captured in IT systems
- Vague Phrases
Mapping ACIP Risks to IT Codes (SNOMED, ICD)

Varied MMWR Language

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Recommendation Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumococcal</td>
<td>“Chronic renal failure”</td>
</tr>
<tr>
<td>HepB</td>
<td>“Persons with end-stage renal disease”</td>
</tr>
<tr>
<td>Influenza</td>
<td>“Renal disorder”</td>
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<tr>
<td>Pneumococcal</td>
<td>“Chronic liver disease (including cirrhosis)”</td>
</tr>
<tr>
<td>HepA and HepB</td>
<td>“Persons with chronic liver disease”</td>
</tr>
<tr>
<td>Influenza</td>
<td>“Hepatic disorder”</td>
</tr>
</tbody>
</table>

Does this represent meaningful variation? Is cirrhosis included in HepA and HepB?
Concepts Not Known to EHR/IIS

- It may not be reasonable for a patient's record to include certain information

- Examples:
  - “Not in a long-term, mutually monogamous relationship”
  - “Close contact with an international adoptee during the first 60 days”
  - “Travel to country with a Yellow Fever vaccination entry requirement”
  - “Microbiologists routinely exposed to Neisseria meningitides”
  - “Household contact with a pregnant woman”

What happens in Vagueness, stays in Vagueness

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<th>Recommendation Language</th>
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<tbody>
<tr>
<td>Various</td>
<td>“Health care personnel”</td>
</tr>
<tr>
<td>HepB</td>
<td>“Public safety worker exposed to blood or infectious body fluids”</td>
</tr>
<tr>
<td>Meningococcal</td>
<td>“Persons at risk during an outbreak”</td>
</tr>
</tbody>
</table>

Does this include anyone working in a health care facility?
Clinicians only?
Lab staff?
Front end staff?

What is the definition of “public safety worker”?
First responders?
Police?
Social workers?

Does this refer to classes of people (e.g. first responders, clinicians) or activities or environmental conditions?
Forward Movement

- **Vocabulary Clarity**
  - Beginning work with ACIP Work Group Leads at CDC on terminology definition
  - Will allow better mapping to SNOMED or ICD terminologies
  - End result will enable more computable ACIP recommendations related to indications and contraindications

- **CDSi Pre-release**
  - Develop and release CDSi material for flu prior to the publication of the MMWR
  - This will allow initial development by CDS engines to begin sooner than normal
  - End result enables new/changed ACIP recommendations to make it in front of providers quicker than today
  - First pilot will be the 2019-2020 Flu Season
  - Formal CDSi release per normal schedule following ACIP MMWR

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In Closing...

- IIS are well populated and continue to grow with your help through well documented vaccination records
- This has strengthened IISs as important analytic tools that support a wealth of population health needs
- Providers can access these data through EHR query at the point of care, supporting clinical decisions, ensuring appropriate immunization, and lowering burden
- While progress to improve interoperability and data quality has been made, collaboration between the EHR and IIS communities is key for continued improvement
- CDSi provides all health IT environments a structured methodology to align with ACIP recommendations which ensures patients receive the right immunization at the right time.
Thank You!

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.