Immunization Information Systems (IIS) Fundamentals: Overview and Development

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NVAC Meeting
June 6, 2017
Washington, D.C.
Overview

- What are IIS?
- Functionalities/Capabilities of IIS
- Data collection and applications
- State of IIS across the United States

**IIS Vision**: Real-time, consolidated immunization data and services for all ages are available for authorized clinical, administrative, and public health users and consumers, anytime and anywhere
What are Immunization Information Systems (IIS)?

- Immunization information systems (IIS) are confidential, population-based, computerized databases that record all immunization doses administered by participating providers to persons residing within a given geopolitical area.

- Why are IIS important?
  - At the **point of clinical care**, an IIS can provide consolidated immunization histories for use by a vaccination provider in determining appropriate client vaccinations.
  - At the **population level**, an IIS provides aggregate data on vaccinations for use in surveillance and program operations, and in guiding public health action with the goals of improving vaccination rates and reducing vaccine-preventable disease.
  - Community Preventive Services Task Force recommends immunization information systems on the basis of strong evidence of effectiveness in increasing vaccination rates. [Listen here](https://www.thecommunityguide.org/findings/vaccination-programs-immunization-information-systems)

*All States will have an IIS with New Hampshire pilot test late summer 2017*
IIS Functions

- Functional standards are intended to identify operational, programmatic, and technical capacities that all IIS should achieve by the end of 2017.
- Some standards are environmental, and can only be implemented in conjunction with the broader Department of Health or State/Local infrastructure.
- The Functional Standards are intended to reflect necessary functions, whether those functions are implemented by the IIS program or others.
- In some cases, current law or policy may preempt full implementation unless changed. In these instances, an unmet standard may serve as a suggestion for possible revisions to such law or policy.

The 2013-2017 Functional Standards can be found at [https://www.cdc.gov/vaccines/programs/iis/func-stds.html](https://www.cdc.gov/vaccines/programs/iis/func-stds.html)
Why IIS are Important

- By two years of age, over 20% of the children in the U.S. typically have seen more than one healthcare provider, resulting in scattered paper medical records.

- Immunization information systems (IIS) help providers and families by consolidating immunization information into one reliable source.

Patients with at least 1 immunization from Dane County Health Department, Wisconsin
Current IIS Environment

Drivers in Broader Environment in which IIS Operate

IIS Stakeholders

Increased Emphasis on Interoperability and Standardization

Meaningful Use and MACRA

State Variation

Widespread Adoption of EHRs

Imz Programs (e.g. AFIX, VFC)

Health Information Exchange Networks

EHR Vendors, HIEs, Private Health Networks

Federal Organizations (e.g. CDC, CMS, NVPO, ONC)

IIS

Immunization Program Growth

Health Plans, ACOs, MMCOs

Day Care Facilities, Schools, Universities

Consumers

Vital Records

Personal Health Records Access

Return on Investments

IIS Data Demands

Funding Sources

“...many things to many people”
IIS Data Sources

Health Care Providers

Vital Records

Health Plans

Pharmacies

Birth Hospitals

Schools/Daycare Facilities
### IIS Platforms

#### Envision (15)
- Arkansas
- Colorado
- Delaware
- Kansas
- Kentucky
- Nevada
- New Mexico
- Philadelphia
- Pacific Islands (6)
- San Antonio

#### STC (10)
- Alaska
- Arizona
- Indiana
- Louisiana
- Mississippi
- New Hampshire
- Tennessee
- Washington
- West Virginia
- Wyoming

#### WIR (18)
- California
- Georgia
- Hawaii
- Idaho
- Iowa
- Maine
- Maryland
- Minnesota
- Montana
- Nebraska
- New York State
- North Carolina
- Oregon
- Puerto Rico
- Texas
- U.S. Virgin Islands
- Virginia
- Wisconsin

- The remaining 21 federally funded immunization programs either developed their own IIS or are supported by a smaller vendor.
IIS Interoperability

- Interoperability between IIS and EHRs can improve surveillance while simultaneously reducing administrative burden.

- Enhancing EHR-IIS interoperability improves data quality challenges by addressing:
  - Accuracy
  - Timeliness
  - Completeness

- EHR-IIS interoperability supported by CDC include:
  - Educating EHR vendors on requirements to build IIS functionality into EHR systems
  - Developing capacity for HL7 2.5.1
  - Implementing bi-directional data exchanges through a web services interface
  - Assessing IIS progress towards meeting IIS Functional Standards
IIS Challenges and Opportunities

IIS Challenges

- Incomplete data reporting
- Differences in performance levels across IIS
- Diversity in stakeholder standards, technologies and policies
- Standards Implementation Variability

IIS Strategic Opportunities

- Enhance IIS Performance
- Promote Adherence to IIS Standards
- Sustain the IIS Community
- Influence and Monitor the Health IT Environment
IIS Participation – Legal/Structural Landscape

A CDC legislative survey of all states plus Washington DC revealed that:

- 47 of 50 states plus Washington DC are *lifespan* IISs
- 42 of 50 states plus Washington DC are *opt-out* IISs for adults
- IIS interstate data sharing remains an issue

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Percentage of children aged < 6 years participating in an Immunization Information System -- United States, five cities §, and D.C., 2015

National Participation: 92% (excluding Territories)
Source: CY2015 IISAR

§ Chicago, IL; Houston, TX; New York City, NY; Philadelphia, PA; San Antonio, TX
*Awardees are federally funded immunization programs
Percentage of adults aged ≥19 years participating in an Immunization Information System -- United States, five cities $\S$, and D.C., 2015

National Participation: 39% (excluding Territories)
Source: CY2015 IISAR

$\S$ Chicago, IL; Houston, TX; New York City, NY; Philadelphia, PA; San Antonio, TX.

*Awardees are federally funded immunization programs
IIS are a Critical Piece Vaccine Ordering and Inventory

Progress to Date

Percentages of vaccine orders processed through VFC/317 vaccine ordering system (VTrckS) in calendar year 2016

Total number of orders in 2016 was 580,885

48 federally funded immunization programs order vaccine directly through their IIS in to the central VFC/317 vaccine ordering system (94% orders, 547,665)

16 immunization programs either order vaccine on behalf of their providers or allow providers to order directly (6% orders, 33,220)
Percentage point differences between National Immunization Survey and IIS for combined 7-vaccine series completion – 2013-2015

Text Version

[Bar chart showing percentage point differences for 2013, 2014, and 2015]

- ≥30 percentage points
- 20 - 29 percentage points
- 10 - 19 percentage points
- <10 percentage points
VFC Provider Participation, 2012 –2015

Text Version
Key Partners

Partnerships are a critical component of the success and evolution of IIS

**NON FEDERAL**
- Public Health Informatics Institute (PHII)
- America Immunization Registry Association (AIRA)
- American Immunization Managers (AIM)
- American Academy of Pediatrics (AAP)
- Association of State and Territorial Health Officials (ASTHO)

**FEDERAL**
- Office of the National Coordinator (ONC)
- National Institute of Standards and Technology (NIST)
- Centers for Medicaid and Medicare Services (CMS)
- National Vaccine Program Office (NVPO)

**JURISDICTIONAL**
- States
- Awardees
Conclusions

- IIS provide consolidated record of immunizations administered by different providers across the lifespan
- Operate in a complex environment and rely on data streams from multiple immunization providers and health systems
- IIS provide value to providers, public health, health insurers, schools and other stakeholders*
- Current challenges provide new opportunities to improve data access and reporting through adherence to standards and interoperability, and increasing IIS performance
- As IIS across the nation mature and provider participation rates increase, the value of IIS to all stakeholders increases

*www.thecommunityguide.org/findings/vaccination-programs-immunization-information-systems
Text only Versions

Percentage of children aged < 6 years participating in an Immunization Information System -- United States, five cities, and D.C., 2015

>95% (31 Awardees)
- Washington
- Oregon
- Idaho
- Montana
- North Dakota
- South Dakota
- Minnesota
- Iowa
- Wisconsin
- Michigan
- Nevada
- Utah
- Colorado
- Arizona
- New Mexico
- Indiana
- Ohio
- Arkansas
- Louisiana
- Mississippi
- New York
- Vermont
- North Carolina
- South Carolina
- Georgia
- Florida
- Delaware
- Rhode Island
- New York City
- Philadelphia
- Houston

75% – 94% (18 Awardees)
- Alaska
- California
- Wyoming
- Nebraska
- Oklahoma
- Texas
- Missouri
- Illinois
- Massachusetts
- New Jersey
- Maryland
- Virginia
- West Virginia
- Tennessee
- Alabama
- Washington DC
- San Antonio
- Chicago

50% – 74% (5 awardees)
- Maine
- Pennsylvania
- Kansas
- Hawaii
- Connecticut

25% – 49% (1 awardee)
Kentucky

No IIS (1 awardee)
New Hampshire
Percentage of adults aged ≥19 years participating in an Immunization Information System -- United States, five cities, and D.C., 2015

>95% (1 Awardee)
Minnesota

75% - 94% (5 Awardees)
- Oregon
- Utah
- North Dakota
- Wisconsin
- Georgia

50% - 74% (17 Awardees)
- Alaska
- Washington
- Nevada
- Idaho
- Montana
- Wyoming
- Colorado
- New Mexico
- South Dakota
- Nebraska
- Iowa
- Arkansas
- Michigan
- Indiana
- Florida
- Vermont
- Massachusetts

25% - 49% (20 Awardees)
- Arizona
- California
- Hawaii
- Oklahoma
- Kansas
- Louisiana
- Mississippi
- Alabama
- Tennessee
- Illinois
- Ohio
- West Virginia
- North Carolina
- South Carolina
- Maryland
- Pennsylvania
- Delaware
- San Antonio
- Chicago
- Philadelphia

<25% (10 Awardees)
- Maine
- New York
- New Jersey
- Virginia
- Kentucky
- Texas
- Missouri
- New York City
- Houston
- Washington D.C.

No IIS (1 awardee)
New Hampshire

No Data (2 awardees)
- Connecticut
- Rhode Island
Percentage point differences between National Immunization Survey and IIS for combined 7-vaccine series completion – 2013-2015

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## VFC Provider Participation, 2012 –2015

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<td>Provider Percentage</td>
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