Information Systems (IIS) Sentinel Sites: Accomplishments and Contributions to the IIS Community

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Presentation Overview

- Overview of the Sentinel Site Project
- Sentinel Site Project Accomplishments
- Contributions to the IIS community
- Future Directions

Overall Purpose

- ❑ Further enhance the data quality, functionality, and scope of the IIS in the surveillance area.

- ❑ Further enhance the analytic capacity of the IIS in support of the immunization program for evaluation and epidemiologic activities.

IIS Sentinel Site Project

- Assesses vaccination coverage for persons aged <19 years
- Implement enhanced data quality procedures
- Usually a subset of the state IIS coverage area with contiguous geographic counties, postal code areas, or census tracts.
- At a minimum, sites need to have:
  - ≥85% vaccine provider sites enrolled in the IIS;
  - ≥ 85% of the children <19 years of age in the population with at least 2 vaccinations recorded in the IIS
  - ≥ 70% of the doses administered should be submitted to and processed by the IIS within 30 days of vaccine administration.

2008-2012 IIS Sentinel Sites

- Arizona
- Colorado
- Michigan
- Minnesota
- New York City
- North Dakota
- Oregon
- Wisconsin

Levels of Sentinel Site Funding

- *Implementation Sites*: sites have at least 200,000 children <19 years of age in their sentinel site area with at least two doses of vaccine recorded in the IIS
  - Arizona, Michigan, Minnesota, New York City, Oregon Wisconsin

- *Capacity Building Sites*: sites have at least 20,000 children <19 years of age in their sentinel site area with at least two doses of vaccine recorded in the IIS
  - Colorado, North Dakota

Sentinel Site Activities

- ❑ Data Quality Improvement and Assessment Enhancement (ARRA)
- ❑ Achieving Functional Standards
- ❑ Timeliness of Immunization Information
- ❑ Progress towards NVAC and MIROW recommendations
- ❑ Expansion of Sentinel Site Area
- ❑ Publications and presentations

ARRA-Funded IIS Projects

- American Recovery Reinvestment Act Funding

- Improving Data Quality and Enhancing Assessment at IIS Sentinel Sites
  - Total Funding for Supplement = $1.2 Million for 2 Years
  - 8 sites funded

ARRA Activities

Activities included at least one of the following:

1. Provide technical enhancements to the IIS and conduct outreach to providers to ensure that incoming and existing vaccine type, vaccine date, vaccine lot number, and vaccine manufacturer fields are captured completely and coded correctly.
2. Incorporate appropriate recommendations from selected best practice guidance into IIS data processing procedures.
3. Incorporate IIS into community-based coverage assessment strategies such as developing or enhancing school-based or WIC immunization assessment modules.
4. Improve child and provider participation in current sentinel site data collection areas, or expand sentinel site areas.

Activities at a Glance

	AZ	CO	MI	MN	ND	NYC	OR	WI
1. Incoming & existing fields are captured completely and coded correctly for:								
• Type and Date	X			X			X	X
• Lot Number & Manufacturer	X			X	X		X	X
2. Improve IIS processing procedures:								
• Data Quality Improvement	X		X		X		X	
• Vaccine deduplication	X					X		X
• Moved or Gone Elsewhere (MOGE)	X		X		X		X	
3. Incorporate IIS into community-based coverage assessment strategies:								
• School-based		X			X			X
• WIC		X						
4. Improve participation while maintaining sentinel site standards								
• Child participation in current SS		X						
• Provider participation in current SS		X						
• Expand SS areas	X	X		X				

ARRA Accomplishments

- Arizona: Developed a new automated de-duplication algorithm

- Colorado: Increased school district participation in the CIIS by 28%, and head start participation by 26%.

- Michigan: Implemented MOGE designations on the provider level, updated addresses in the MCIR, and designated 110,000 records as inactive at the provider or jurisdictional level

ARRA Accomplishments

- ❑ Minnesota: Targeted areas with low provider participation in order to expanded Sentinel Site Area to include the entire State

- ❑ North Dakota: Implemented Enhanced MOGE functionality into NDIIS, and the NDIIS was able to connect to its first EMR via HL7 2.5.1 in October 2011.

- ❑ New York City: Revised immunization de-duplication algorithm that is run against the CIR database to delete duplicate immunizations.
  - Changed permissions to allow for provider entry into additional fields.
  - Savings in staff time

ARRA Accomplishments

- Oregon: Improved data quality and timeliness, and Migrated existing IIS data to a new IIS platform

- Wisconsin: Improved overall Data Quality in the Wisconsin Immunization Registry (WIR), and implemented School access functionality

Impact of ARRA Sentinel Site Grant

- Sentinel Site Area Expansion
  - Minnesota
  - Michigan
- Publications and contributions to the literature
- Evaluation Activities
- Increased collaborations
- Increased capacity
- Improvements in Data Quality and timeliness

NVAC Functional Standard Implementation

- Sentinel Sites were required to show the ability to meet the requirements of several functional standards, including:
  - FS#1: Electronically store data on all NVAC-approved cored data elements (including vaccine lot number and manufacturer
  - FS#4: Receive and process immunization information within one month (30 days) of vaccine administration
  - FS#12: Promote accuracy and completeness of IIS data
- All Sentinel Site Projects were able to meet these functional standards, or show significant progress towards achievement.

Data Timeliness

❑ Sentinel Site Requirement: At least 70% of doses administered from the Sentinel Site Area must be submitted to the IIS within 30 days of vaccine administration

❑ All Sentinel Sites have exceeded this benchmark for the 2008-2012 Cycle

Sentinel Site Area Expansion

- **Several Sentinel Sites have been able to expand their Sentinel Site area during the grant cycle:**
    - Minnesota: Added Ramsey Co. to Sentinel Site area
        - Expanded area would now include two most populous counties in MN (Hennepin and Ramsey Counties) which include 32% of the state population
        - In 2012, Minnesota began including the whole state as their Sentinel Area
    - Michigan: Expanded to include the entire state, including the Detroit metro counties
    - Colorado: Increased provider participation in additional counties to prepare for future expansion

Publications

- Implementation Sentinel Sites are required to submit at least one manuscript or white paper for publication to a scientific journal.

- Many Sentinel Sites meet or exceed this requirement

- Sentinel Sites have contributed about 50% of US literature considered by the IIS Community Guide

Publications

- White KE, Pabst LJ, Cullen KA. Up-to-date *Haemophilus influenzae* type b (Hib) vaccination coverage during a vaccine shortage. Pediatrics 2011;127:e707-12.
  - During the 2008-2009 Hib vaccine shortage, vaccination coverage was known to have decreased in Minnesota
  - Minnesota Sentinel Site data were used as a premise to measure Hib vaccination coverage in all 7 Sentinel Site states.
  - Vaccination coverage was shown to decrease in 7 of 8 Sentinel Sites.
  - A significant decrease in Hib vaccination coverage for the primary series was observed and was consistent across several US localities.

Publications

- **Information from the Hib Shortage Investigation was used to:**
  - Create Health Alert Network (HAN) Messages that provide notification of public health emergencies
  - Reminder messages were included in vaccine shipments reminding providers to administer a third dose of Hib Vaccine
  - Serve as a model of how Sentinel Site data can be used a timely data source in the event of a public health emergency

Publications

- Robinson, SG. Incomplete Early Childhood Immunization Series and Missing Fourth DTaP Immunizations; Missed Opportunities or Missed Visits? IRSN Preventative Medicine: Vol. 2013
    - Assessed the timeliness of 15-18 month provider encounters received by children who miss a fourth timely DTaP
    - Question: Are children who miss a timely fourth DTapP missing them due to lack of provider encounters, or to visits without immunizations
    - Population: Two year olds in the Oregon ALERT IIS with medical encounter records in the Oregon Healthy Plan. N=9,539

Publications-Results

- Among those with 3 valid DTaPs by 9 months of age:
  - 31.6% failed to receive a timeline 4th DTaP
  - Of those without a 4th DTaP, 42.1% did not have any provider visits from 15 through 18 months of age., while 57.9% had at least one provider visit
  - Those with a 4th DTaP averaged 2.45 encounters, while those with encounters but no a 4th DTaP averaged 2.23 encounters.
  - Study showes the value of linking immunization data with medical encounter data.

Data Use: HPV Uptake in Males

- To determine HPV vaccination coverage from Q4 2009 – Q1 2012 for males and females
- To determine the distribution of HPV vaccine doses administered to males and females from October 17, 2009 to March 31, 2012
- To determine the age at first vaccination for males (Q4 2011) and females (Q3 2007 & Q4 2011)
- Birth cohorts defined by quarter for 11-12, 13-15, 16-18 year olds

HPV Uptake in Males-Findings

- Increase in doses administered to and vaccination coverage for males
- Seasonal variation in doses administered to females, little change in coverage
- Larger percentage of females being vaccinated at the recommended age group
- Sentinel Sites provided the only up-to-date data available on uptake in males in 2012.
- Data presented at 2012 ACIP Meeting

Future Direction of Sentinel Sites: 2013-2017

- Transition from Grant to Cooperative Agreement
- Record-level data submission to CDC
- Funding all sites at implementation level
- Increased focus on evaluation activities and best practices
- Modify publications requirement
  - 4 publications during the 5 year cooperative agreement cycle
  - Enhanced role of sentinel sites in project proposal review process
- Emphasis on collaborations
- SS face-to-face meeting apart from NIC

Benefits & Accomplishments – CDC Perspective

- **Publications**
  - Sentinel Sites have contributed about 50% of US literature considered by the Community Guide
- **Presentations**
- **Knowledge sharing between sentinel sites & CDC:**
  - Analysis methodology
  - Data processing & system functionality
  - Immunization program support
- **Dedicated time and resources for enhancing data quality**
- **Advancing the public health role of IIS**
  - Source of real-time data

Benefits & Accomplishments – SS Perspective

- **Data Quality**
  - IIS functional standards and NVAC core data element improvement
  - MIROW business rule implementation
    - Vaccination & patient record deduplication
    - MOGE status
    - Data cleaning / error identification at the point of data entry
    - Data quality reports at the program and provider level
  - Data quality procedures developed / tested in the SS region have been expanded statewide

Benefits & Accomplishments – SS Perspective

❑ **Enhanced analytic capacity at the IIS**

- Run quarterly reports and ad hoc queries for sentinel site area and statewide
- More time / opportunity to look at and use the data in the IIS

❑ **Collaborations/Partnerships**

- Forged stronger relationships with immunization program staff, local public health agencies, and other stakeholders
- Strengthened partnerships with sentinel counties
- Increased knowledge among stakeholders about IIS data use

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