MIROW Decrementing Inventory via Electronic Data Exchange
AIRA National Conference
April 6, 2016 – Seattle, WA
Overview

- Introduction to MIROW
- Overview of DI-v-EDE
- Implementation Considerations
  - User Perspective
Introduction to MIROW

- The Modeling of Immunization Registry Operations Workgroup
  - Formed in 2005
  - AIRA in partnership with IISSB at the CDC

- Objective
  - Develop and promote IIS Best Practices

- Goal
  - Provide the basis and support for uniform alignment of IIS processes

Inconsistency among IIS negatively affects overall data quality, comparability, operational cost, and usefulness of information.
MIROW Steering Committee

- Oversight from the MIROW Steering Committee
  - Warren Williams – Co-Chair
  - Elaine Lowery - Co-Chair
  - Brandy Altstadter, STC
  - Amanda Harris, NV
  - David Lyalin, CDC
  - Megan Meldrum, NY
  - Elizabeth Parilla, MN
  - Katie Reed, HP
  - Kim Tichy, IA
  - Bhavani Sathya, NJ

- AIRA Staff
  - Rebecca Coyle
  - Nichole Lambrecht
How MIROW Works

- Business analysis and development process support provided by IISB/CDC and AIRA public health consultants
- Organizational support for in-person meetings from AIRA staff
- Facilitation support for in-person meetings provided by external consultants
- Volunteering subject matter experts from the IIS community
The MIROW Process

- Brainstorming
- Discussing
- Reaching Consensus

Consensus = “I can live with that and support it”
The MIROW Process
Past Topics

- Management of Patient Active/Inactive Status in IIS
- Data Quality Assurance – Selected Aspects
- Inventory Management
- Patient Eligibility for the VFC Program and Grantee Immunization Programs
- Reminder/Recall
- Incoming Data Quality Assurance – Incoming Data
- Vaccination Level Deduplication
- IIS-Vaccine Adverse Event Reporting System Collaboration (pilot project)
Decrementing Inventory via Electronic Data Exchange

Recommendations of the American Immunization Registry Association (AIRA) Modeling of Immunization Registry Operations Work Group (MIROW)

March 31, 2016

Download MIROW documents at:
AIRA web site: http://www.immregistries.org/pubs/mirow.html
CDC web site: www.cdc.gov/vaccines/programs/iis/activities/mirow.html
Why DI-v-EDE?

- DI-v-EDE assists immunization programs in maintaining more accurate provider vaccine inventories and provider organizations in meeting awardee immunization program operational requirements (e.g., vaccine accountability).
Development Methods

- Formed a diverse workgroup comprised of 13 subject matter experts
  - IIS Staff
  - IIS Vendor Staff
  - Health IT Vendor Staff
- Utilized modern business analysis and facilitation techniques
- Conducted preliminary work
  - Collected and analyzed existing IIS materials
- Met July 2015 (Decatur, GA)
  - Analyzed existing practices
  - Formulated consensus-based recommendations
- Finalized work via phone meetings
- Small group and workshop
**DI-v-EDE Concepts**

- The DI-v-EDE process is an automated method to decrement the number of vaccine doses in a provider organization’s inventory in the IIS when the organization reports a vaccination event through electronic data exchange from an EHR to the IIS.

- Each provider organization’s vaccine inventory is categorized based on funding indicators.

- To deduct a vaccine dose from the appropriate stock the IIS matches information that the provider organization submits regarding a vaccination event against the information that IIS has for the inventory of that provider organization.

- The IIS uses data elements such as lot number, lot number expiration date, dose level eligibility, lot level public/private indicator and, in some cases, dose level public/private indicator to match inventory.
Fundamental Concepts

- Fund Type
- Storage Model
- Dose Level Eligibility
- Dose Level Public/Private Indicator
- Lot Level Public/Private Indicator
Fund Type

- Describes the program (or a private payee) that paid for vaccine.
- Each dose of vaccine is paid for with funds from a public program (e.g., VFC, 317, state or CHIP funds) or private funding.
Storage Model

- Describes the way vaccine stocks are physically separated in the provider organization’s storage unit.

- Depending on the awardee’s requirements,
  - the provider organization may need to separate the vaccines by fund type or
  - may be allowed to have less specific categories (e.g., VFC public, non-VFC public and private).
Multi-stock (4 or more) model

- Provider organization separates vaccines by fund type (e.g., VFC, 317, CHIP, State, and private).
- This model takes advantage of the fact that a provider organization knows fund type for each vaccine from the packing slip or other mechanism.
Three-stock model

- Provider organization separates vaccines into three funding source categories.
- This is the only model that VFC recommends; however, awardees can request to use a model that blends fund types into two stocks or one stock.
Two-stock model

The provider organization separates vaccines into two funding source categories.
One-stock model

- Does not require provider organizations to partition vaccines into multiple inventory stocks within their storage.

- Two types:
  - Replacement: The provider organization uses privately-funded vaccines to vaccinate all patients and the VFC program replaces privately-funded vaccines that were administered to VFC eligible children.
  - Universal: The provider organization only has publicly-funded vaccine (at least for pediatric patients) supplied directly from the awardee immunization program.
Dose Level Eligibility

- Dose level eligibility describes a patient’s eligibility for a dose of vaccine from a funding program (e.g. VFC, 317, etc.)
- Determined for each dose administered to a patient at the time of the vaccination event.
Dose Level Public/Private Indicator

- The provider selects a dose of vaccine from the storage unit based on the patient’s eligibility.
- When the provider documents the vaccination event, they may include
  - specific fund type of the dose administered or
  - less specific categories (e.g., VFC public, non-VFC public & private).
Dose Level Public/Private Indicator

- These less specific categories are referred to as dose level public/private indicator since the data element identifies if the dose that was administered was purchased with public or private funds.

- Dose level public/private indicator is an aggregated reflection of fund type at the vaccine dose level.
Lot Level Public/Private Indicator

- The lot level public/private indicator is an aggregated reflection of fund type at the vaccine lot level.
- It indicates if vaccine doses with a given lot number are associated with publicly-funded or privately-funded inventory in the IIS.
DI-v-EDE Workgroup

Experts
- Brandy Altstadter, STC
- Jennifer Bednar, HP
- Janet Fath, CDC
- Danielle Hall, ME
- Amanda Harris, NV
- Therese Hoyle, MI
- Tracy Little, OR
- Megan Meldrum, NY
- Bhavani Sathya, NJ

Project Support Team
- Warren William, Co-Chair
- Elaine Lowery, Co-Chair
- Nichole Lambrecht, AIRA
- Angela Lindsay, CDC
- David Lyalin, CDC
- Elizabeth Parilla, MN
Implementation Considerations

- Key Data Elements
- Data Quality
- HL7 Immunization Messaging
- EHR
- Outreach and Education
- Staff Time
- Resources
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Michigan is a 2 Stock Model

Funding Source: Public

Fund Types: VFC, 317, CHIP, State

Funding Source: Private

Fund Type: Private
In 1999 MCIR released an Inventory Module
EXT files deducted from inventory if the lot number matched the inventory in the IIS.
Very few provider offices used the inventory module
It did not separate private from public vaccine.
Inventory Module Enhancement 2012

- New inventory module
- 2 stock model
- Private and Public
- Flat File deducted from inventory
- Submitting VFC orders to VTrckS since December 2010 (EXIS)
- Processing McKesson Shipping Files since 2011
HL7 Immunization Messaging

- 2012 Implemented HL7 2.5.1
- Onboarding does take a little more time with per site to meet the inventory requirements
- 440 VFC provider sites are submitting HL7 messages
Key Data Elements

- Provider Organization level identifiers, including sending facility and administering facility.
- Patient identifiers and demographic information for matching and or adding new patient to MCIR.
- Lot Number
- CVX Codes
- MVX Codes
- Dose Level Eligibility
- Date Administered
Data Quality

- Having a test bed with active inventory for HL7 testing
- Lot number may be missing a letter or a number
- CVX code mapping and manufacture code mapping
- How the EHR displays vaccines to the end user
- Historical vs Administered
Data Quality (cont’d)

- Deleting or modifying an existing dose in the IIS via HL7
- Implementing Unique Vaccine ID process to help manage this process. Currently 500,000 doses of vaccine in MCIR have a unique Vaccine ID associated with them.
- Ongoing modifications of data quality reports to meet the end users needs.
Electronic Health Record (EHR)

- Dose level eligibility was an issue for EHR vendors.
- The staff using an EHR recognizes the importance of data quality when submitting via HL7 to MCIR.
- User chooses the wrong vaccine in the HER, but immunizes with the correct dose.
Outreach and Education

- How to use data quality reports in MCIR.
- Encourage end users to review data quality reports daily or at a minimum once a week.
- Primarily the focus is on data quality!!!!
Staff Time

- Reconciliation is time consuming for all.
- Onboarding requires dedicated staff to train on HL7 submissions and the use of the vaccine inventory.
  - Michigan has 2.5 FTE’s for onboarding
  - 12 FTE’s for training (MCIR Regional Staff)
## Resources

### Inventory Deductions

<table>
<thead>
<tr>
<th>Admin Date</th>
<th>Product - Lot</th>
<th>Eligibility</th>
<th>Action</th>
<th>Inv.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test, Patient - 08/16/2003 - 3023226780</td>
<td>Tdap (adol/adult) (Glaxo) - 7GH57</td>
<td>Under Insured</td>
<td>Add</td>
<td>VFC</td>
</tr>
<tr>
<td>04/06/2015</td>
<td>HPV4 (Gardasil) (Merck) - K006960</td>
<td>Under Insured</td>
<td>Add</td>
<td>VFC</td>
</tr>
<tr>
<td>Test, Patient 2 - 06/09/2013 - 36750889123</td>
<td>Varicella (Varivax) (Merck) - J013903</td>
<td>Medicaid-VFC</td>
<td>Add</td>
<td>VFC</td>
</tr>
<tr>
<td>04/10/2015</td>
<td>DTaP-Hep B-IPV (Pediatrix) (Glaxo) - 5A5T5</td>
<td>Medicaid-VFC</td>
<td>Add</td>
<td>VFC</td>
</tr>
<tr>
<td>Test, Patient 3 - 01/17/2015 - 36123352073</td>
<td>Hib (PedvaxHIB) (Merck) - J015435</td>
<td>Medicaid-VFC</td>
<td>Add</td>
<td>VFC</td>
</tr>
<tr>
<td>04/22/2015</td>
<td>PCV13 (Prevnar13) (Wyeth (WAL)) - J11485</td>
<td>Medicaid-VFC</td>
<td>Add</td>
<td>VFC</td>
</tr>
</tbody>
</table>
## No Inventory Deductions

<table>
<thead>
<tr>
<th>Admin Date</th>
<th>Product - Lot</th>
<th>Eligibility</th>
<th>Action</th>
<th>Inv.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test, Patient - 11/21/1998 - 100403236845</td>
<td>HPV4 (Gardasil) (Merck) - K009482 Status: Lot not found inventory</td>
<td>Private Pay/Insurance</td>
<td>Add</td>
<td>UNK</td>
</tr>
<tr>
<td>04/20/2015</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test, Patient 5 - 02/04/2001 - 30122448966</td>
<td>HPV4 (Gardasil) (Merck) - K009482 Status: Lot not found inventory</td>
<td>Private Pay/Insurance</td>
<td>Add</td>
<td>UNK</td>
</tr>
<tr>
<td>04/01/2015</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test, Patient 7 - 12/13/1943 - 56507828888</td>
<td>PPSV23 (Pneumovax) (Merck) - K007262 Status: Lot not found inventory</td>
<td>Medicare A</td>
<td>Add</td>
<td>UNK</td>
</tr>
<tr>
<td>04/09/2015</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test, Patient - 10/10/1948 - 56623881237</td>
<td>Hep B (ped/ado) (Glaxo) - 99B32 Status: Lot not found inventory</td>
<td>Private Pay/Insurance</td>
<td>Add</td>
<td>UNK</td>
</tr>
<tr>
<td>04/23/2015</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEST, PATIENT - 07/15/1945 - 54472735653</td>
<td>Zoster (Zostavax) (Merck) - K012785 Status: Lot not found inventory</td>
<td>Medicare A</td>
<td>Add</td>
<td>UNK</td>
</tr>
<tr>
<td>04/16/2015</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TEST, PATIENT 3 - 03/05/1950 - 51163526332</td>
<td>PPSV23 (Pneumovax) (Merck) - K007262 Status: Lot not found inventory</td>
<td>Medicare A</td>
<td>Add</td>
<td>UNK</td>
</tr>
<tr>
<td>04/23/2015</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Future Enhancements

- Funding Source (possible if EHR’s capture it)
  - Private
  - Public
- Capturing Expiration Date in HL7 Message
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New Jersey IIS

- Inventory module
- VTrckS-ExIS integration implemented in 2012
- VFC/317 vaccines are automatically added into inventory module and available for decrementing
- Providers have the option to enter private vaccines into NJ IIS inventory
- DI-v-EDE in place since 2009; updated 2013
- NJ IIS interface engine supports:
  - HL7 v2.3.1 and v2.5.1
  - Action codes Add, Update, Delete (RXA-21)
- Do not currently support funding source field
  - Dose-level eligibility is used to determine whether to deduct from public or private vaccine inventory
Key Data Elements

- Provider Organization level identifiers, including sending facility and administering facility.
- Patient identifiers and demographic information for matching and or adding new patient to NJ IIS.
- Date Administered
- CVX Codes
- Dose Level Eligibility
- Lot Number
Data Quality

- Pre-certification (onboarding)
  - CVX code mapping
  - Lot number and dose-level eligibility reported for all administered doses
  - Patient-level demographics and identifiers for matching

- Production data review
  - Three interoperability reports available in NJ IIS
Data Quality (cont’d)

- Three interoperability reports available in NJ IIS
  - Statistics report - overview of all data submitted and whether patients/doses were successfully added
  - VFC statistics report - same as statistics report but only includes doses submitted with VFC eligibility
  - Details report - provides details about processing for each patient and dose; identifies errors
    - Dose status - ‘Added’ or ‘Not Added’, ‘Deleted’ or ‘Not Deleted’, ‘Updated’ or ‘Not Updated’
    - Dose status message - provides reason why the dose was not added

- Troubleshooting Guides
  - Review frequently encountered issues/scenarios
  - Review how to use the
Data Quality (cont’d)

- Frequently encountered errors that cause problems with inventory decrementing
  - Incorrect lot number reported
  - Incorrect dose-level VFC eligibility submitted or no dose-level VFC eligibility was included in submission
  - Patient not matched or added in NJ IIS
Scenario: VFC Dose Added into Patient Record but Inventory not Decremented
Reason: Incorrect lot number reported

Option 1: Update EHR with correct lot number and resubmit HL7 message or file to NJIIS (as an update)

Option 2: Edit the vaccine in NJIIS with the correct lot number that matches inventory and correct your EHR without submitting an update
Scenario: Dose added to patient record with no inventory decremented
Reason: VFC eligibility was not reported

Interface File Details Report
- Identify the problem
- VFC eligibility Not available
- Dose status message—no matching inventory found

Corrective action

2 options

Option 1:
EHR data should be updated with correct dose-level VFC eligibility and file or HL7 message resubmitted to NJIIS (as an update).

Option 2:
Use the Edit Immunization function in NJIIS to correct the patient and dose-level funding source. Make the correction in EHR without sending update.
Scenario: Patient and Doses Not Added into NJ IIS
Reason: Multiple possible matches

Interface File Statistics Report
- Identify the problem
- Patient multi match – not added into NJIIS
- Note transaction ID

Reports correlate to each other using:
- Transaction IDs
- File Name
- Message control ID

Interface File Detail Report
- Patient status – Multi Match
- Patient Status Message
- Lists the possible matches

Corrective action
Find the correct match in NJIIS and correct name in your EHR

Option 1:
File or HL7 message should be resubmitted to NJIIS.

Option 2:
If not possible add the vaccine to the correct registry ID manually & correct the EHR record
Electronic Health Record (EHR)

- During pre-certification (onboarding), we request production data submitted to our test system to evaluate readiness for production interface
- Variability in ability to support all action codes (add, delete, update)
- Ensure all CVX codes are supported
- NJ IIS staff work closely with EHR staff to resolve issues during pre-certification and after
- Important to include vendor contact on go-live calls with practices to ensure everyone is on the same page
Outreach and Education

- Significant staff time spent on outreach and education
  - Developing training materials
  - Creating support documentation
  - Answering follow-up questions from users

Training opportunities:
- Interface webinar training (6 modules)
  - Training is web-based using pre-recorded modules with live question & answer session with NJ IIS Trainer and NJ IIS Interoperability Coordinator
- Regional interface workshops - in-person training for practices requiring extra help
  - Pre-requisite is interface webinar training
  - Minimum of 4 NJ IIS staff required (for 8 -10 trainees) to assist users one-to-one with how to review reports and correct errors to ensure VFC inventory is accurate
Staff Time / Resources

- Supporting DI-v-EDE can be resource intensive:
  - Pre-certification (onboarding) is time and resource intensive
    - Ensuring correct submissions up front should reduce errors in production environment
    - 5.5 FTEs required for onboarding and data quality review
  - 4 FTEs for training (but only 1 in any given month is conducting interface training)
Acknowledgements

- Subject Matter Experts
- Steering Committee
- Facilitation Team at Advanced Strategies
- AIRA Staff
- Grantee IIS
- Participants of 2014 MIROW Workshop
- External Reviewers
- Technical Editor at CDC
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Read MIROW recommendations documents and abridged mini-guides at:

AIRA website:
http://www.immregistries.org/resources/aira-mirow

CDC website:
www.cdc.gov/vaccines/programs/iis/activities/mirow.html
Q & A