

The Usefulness of Linking an Immunization Information System to a Disease Surveillance Database

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Outline

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Citywide Immunization Registry (CIR)

- New York City’s Immunization Information System, population-based registry, with birth records of children born in New York City (NYC)
- Established in 1996
- Collects immunization history and demographic information on children 0-18 years old
 - Reporting for 0-18 y/o is mandated by law
 - Reporting for ≥ 19 y/o requires – consent
- Health care providers report immunizations online or through their electronic health record



Maven

- A disease surveillance database used by several jurisdictions and multiple bureaus in NYC Department of Health and Mental Hygiene
- Implemented for the Bureau of Immunization in October 2011 used by the surveillance unit to track vaccine preventable diseases: measles, mumps, rubella, pertussis, and invasive pneumococcal disease (IPD)
- Used for case management, contact tracing, and outbreak management



Objective

- To evaluate how the linkage between the CIR and Maven databases affected the Bureau of Immunization's vaccine preventable disease investigations during the first three years of implementation: 2012-2014.



Prior to CIR-Maven Linkage

- Before the year 2000, surveillance staff did not use the CIR at all, they solely relied on providers and/or parents to fax them documented immunization records
- As years progressed, surveillance staff began to use the CIR to find immunization records, but it was infrequent
- In more recent years, the CIR became more complete so surveillance staff began to use the CIR regularly to obtain immunization records
 - Logged onto the CIR, searched for each person manually, using demographic information
 - Entered the vaccine name, administration date and other related information into external databases

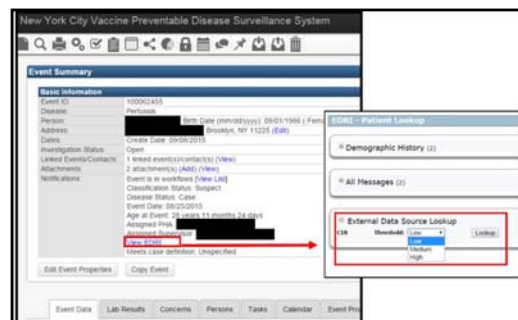


CIR-Maven Linkage

- Developed by the Division of Informatics and Information Technology with the help from surveillance and the CIR staff
- Allows surveillance staff to:
 - Directly query the CIR in Maven
 - Upload immunizations from the CIR directly to Maven in real-time
 - Request CIR staff to add immunizations missing from the CIR and found by other means



Search Record in CIR Through Maven



Immunization Data in Maven

Has the person EVER received vaccinations for this disease? Yes

Vaccine type II DTaP-IPVb

Date given 09/15/2011

Manufacturer UNOQVIN

Lot number C95448

Lot expiration

Age of person at time of vaccine (years) 0

Age of person at time of vaccine (class) 03

Vaccine invalid

Number of days before event date vaccine was administered 1440

11/14/2011 # DTaP-IPVb

11/24/2012 # DTaP-IPVb

10/15/2012 # DTaP

10/20/2014 # DTaP-IPVb

Number of valid doses prior to the event date 4



Request Immunization Records to be added to the CIR

CIR record requires update? Yes Add New

Date update requested 09/16/2015

Reason update required

Immunizations to add

CIR records to merge

Correction to record

Other (specify below)

Does person reside in NYC?

Notes regarding update (CIR patient key(s) of records to merge, etc)

Was the CIR update completed? Not Reviewed Yet



Methods

Data sources used:

- CIR-Maven Data
- Survey: obtained information about surveillance staff practices, pre and post linkage



CIR-Maven Data

- Using post linkage data we evaluated the following components:
 1. The number (percentage) of investigations for which immunization records were found in the CIR
 2. The number of immunization doses in the CIR prior to disease onset
 3. The number (percentage) of investigations for which surveillance staff requested immunizations to be added to the CIR
- Pre and post evaluation
 1. The number of immunization-related variables documented in the surveillance database pre and post linkage



Survey of Surveillance Staff

- Administered survey to 6 members of surveillance staff who worked at DOHMH prior to the Maven implementation
- Consisted of 13 questions and a post survey discussion
- Areas of focus included:
 - Investigation practices pre and post Maven as they relate to immunization records
 - Staff’s opinion of time saved following the CIR-Maven linkage



Results

- From 2012-2014, N=12,705 investigations occurred

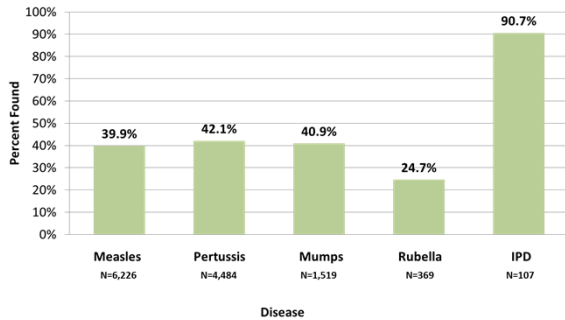
Disease	Case, n (%)	Contact, n (%)	n (%)
Measles	825 (6.5)	5,400 (42.5)	6,226 (49.0)
Pertussis	1,803 (14.2)	2,678 (21.1)	4,484 (35.3)
Mumps	628 (5.0)	891 (7.0)	1,519 (12.0)
Rubella	292 (2.3)	77 (0.6)	369 (2.9)
IPD	106 (0.8)	0 (0)	107 (0.8)

Note: frequency missing = 5

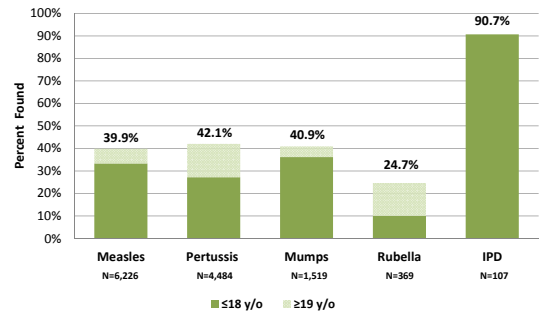
- Among all the investigations 5,166 (40.7%) immunization records were found in the CIR that was transmitted to Maven
- 10,480 immunization doses were administered prior to disease onset
- Immunization records were added to the CIR for 632 (12.2%) investigations



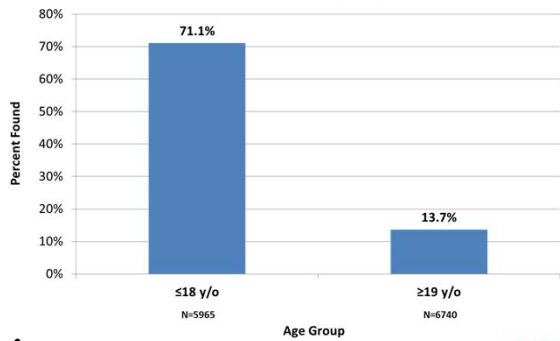
Percentage of Investigations for which Immunizations were Found in the CIR by Age, 2012-2014



Percentage of Investigations for which Immunizations were Found in the CIR by Age and Disease, 2012-2014



Percentage of Investigations with Immunization Records Found in the CIR by Age, 2012-2014



Survey Results

- Staff routinely search the CIR for immunization records through Maven
- All staff requested that immunization records that were not in the CIR but found by other means be added to the CIR
- Additional immunization variables are captured in surveillance database as a result of the linkage (e.g. type of vaccine, valid dose, demographic information)
- Staff reported that linkage saved time during investigations



Limitations

- Lack of easily accessible quantitative data prior to the linkage
- We didn't quantify time, labor and cost saved per investigation after CIR-Maven linkage



Conclusions

- The CIR-Maven linkage allows for a more efficient ascertainment and importation of immunization records
- Reduces manual data entry and opportunity for error
- More detailed immunization data captured
- Has made reverse updates of immunization records to the CIR more efficient



Next Steps

- Evaluate the benefits of the linkage for the Perinatal Hepatitis B Unit, which also uses Maven to track children who were born to Hepatitis B positive women
- Evaluate the different levels of effort needed during an outbreak



Thank You

