

COVID-19 Immunization Status among Massachusetts (MA) Residents after Data Exchange with Rhode Island (RI)

Data Assessment Unit

Immunization Division

Bureau of Infectious Disease and Laboratory Sciences

Massachusetts Department of Public Health

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Madison Lyman, MPH



Interjurisdictional Data Exchange



- MA's first data exchange with another jurisdiction
- Exchange began in Spring 2022
 - MA IIS = MIIS
 - RI IIS = RICAIR
- Receive HL7 messages weekly
- Awaiting IZ gateway connection

Hermes Furian, Peter. "Massachusetts, Gray Political Map, with Capital Boston. Commonwealth of Massachusetts, MA. Most Populous State in the New England Region of United States. The Bay State. English. Illustration. Vector." *Adobe Stock*,

stock.adobe.com/search?gclid=CjwKCAjw_YShBhAiEiwAMomsEBrggMFRaUIJUduexp00ReIYRANxjYwn5QDS2tacmuM_tZZs8BNhBoCenkQAvD_BwE&k=new+england+map&ef_id=CjwKCAjw_YShBhAiEiwAMomsEBrggMFRaUIJUduexp00ReIYRANxjYwn5QDS2tacmuM_tZZs8BNhBoCenkQAvD_BwE%3AG%3As&s_kwid=AL!308513!646734539663!!!g!!!2089170876!84594855331&as_channel=sem&as_campclass=nonbrand&as_campaign=US%7CCPRO%7CStock%7CAWAR%7CDSA_Website_pages%7CGG%7C%7C&as_source=google&as_camptype=acquisition&sdid=85665X9X&mv=search&as_audience=core&continue-checkout=1&asset_id=378749495.

Massachusetts Immunization Information System (MIIS)

- Established in 2011
- Collects immunization data from all licensed providers (3,514 sites currently) who administer vaccine in the Commonwealth of MA
 - Healthcare facilities
 - Commercial pharmacies
 - School-based Health Centers
- Vaccinators are mandated to report all administered vaccines for:
 - MA residents and non-residents
 - All age groups
 - State and privately supplied vaccine
- No option to opt-out, however patients may opt into “no data sharing” status
 - Composite record is only visible to jurisdiction not participating providers

Rhode Island Child and Adult Immunization Registry (RICAIR)

- KIDSNET established in 1997 for those under 19 years of age which included the immunization registry. In Fall 2020, RICAIR was established to expand the registry to children and adults
- Collects immunization data from all child and adult providers (485 sites currently) in the state of RI who administer COVID-19 or receive state supplied vaccine
 - Commercial pharmacies also required to report influenza vaccine regardless of supply source
 - As RICAIR is new, most adult providers are still establishing an electronic connection to the system
- Vaccinators are mandated to report all administered vaccines for:
 - RI residents and non-residents
 - All age groups
- There is an option to opt out of the registry by having record removed from system

Problem Statement

- How do we know whether missing information in an immunization registry represents incomplete record keeping or absence of a vaccination event?
- RI data exchange gave us an opportunity to drill down on this issue by examining impact on vaccination records for MA residents who appeared to be under-vaccinated in MIIS.
- When we added in vaccination records from RI, we could see what proportion of missing data might be available to us with better information sharing across jurisdictions.
- For this assessment, we looked particularly at a proxy for COVID-19 booster status, which was of particular interest at the time of the investigation.

Methods

- RICAIR submits HL7 messages as historical doses for vaccines given to patients whose records contain current or previous addresses in MA
 - Association to RICAIR: immunization data was reported by RICAIR to patient record
- MIIS data accessed from an Oracle-based operational data store using SQL and further manipulated using macros in Excel
- Dose count groupings created to reveal the impact of adding RICAIR data to MIIS patient records
- Analyzed the change in dose count from MIIS data only to MIIS+RICAIR data

Dose Count Groupings

- COVID-19 immunizations reported to MIIS
 - 0 immunizations on record
 - 1-2 immunizations on record
 - 3 or more immunizations
- Stratified dose count groups by data source (MIIS vs RICAIR) and age group

Dose Count Groupings Cont.

- COVID-19 vaccine series definition at time of analysis based on predominant mRNA vaccine types
 - 2 primary doses followed by 1 booster dose
- Aligning with CDC clinical decision support tools, we defined COVID-19 vaccination status by dose count rather than a combination of dose count, interval between doses, and vaccine brand
 - Given low frequency of non-mRNA vaccine in this population of MA and RI residents and visitors, we approximated boosted vaccine status by examining 3 or more doses of COVID-19 vaccine

Results – Change in Immunization Number

As of 12/9/2022:

Number of HL7 messages received: 120,464 HL7 messages

Number of patients associated to RICAIR: 95,496 patients

Number of Immunizations	MIIS Data Only (count of RI associated patients)	MIIS + RICAIR Data (count of RI associated patients)	Percent Difference from MIIS Only to MIIS+RICAIR
0	41,474	15,239	-63%
1 -2	36,738	27,932	-24%
3 or more	17,284	52,325	+203%

Results – Percent Change in Immunization Number with Addition of RICAIR Data Stratified by Age Group

Age Groups	0 Immunizations	1-2 Immunizations	3+ Immunizations
0-4 years	-7%	+65%	+61%
5-11 years	-24%	+46%	+95%
12-15 years	-33%	+27%	+100%
16-19 years	-37%	-14%	+108%
20-29 years	-81%	-28%	+266%
30-39 years	-88%	-1%	+380%
40-49 years	-91%	-29%	+340%
50-59 years	-92%	-41%	+243%
60-64 years	-92%	-52%	+174%
65-69 years	-93%	-55%	+151%
70-74 years	-90%	-62%	+108%
75+ years	-88%	-59%	+93%

Conclusions

- MHS patient records were missing immunization data that improved patient vaccination status
 - For some patients, their entire vaccination history was obtained from the data exchange
- Data exchange increased COVID-19 vaccine record completeness for 62,782 patients (66% of RICAIR-associated patient records)

Challenges

- Duplicate reporting of vaccine administration
 - MA resident reported to MA provider they received vaccine in RI
- Quality of data
 - RICAIR data entered MIIS as historical, unknown if vaccine was reported as administered or historical in RICAIR
- Building connections between data analysts and technical partners when bridging data systems together
 - The information that data analysts needs can differ from what the technical groups need to complete an exchange

Next Steps

- Apply analysis to routine immunization
- Improve technical specifications from lessons learned
 - Access to all address history
 - Identifying administered vs historically reported vaccines
- Information sharing about IIS populations
- Connecting to other bordering states
 - IZ gateway connection in progress

Thank you!

