COMPLETENESS OF IMMUNIZATION INFORMATION SYSTEM VACCINE INFORMATION: A SYSTEMATIC REVIEW

Tessa Hastings, MS; Lindsey Hohmann, PharmD; Richard Hansen, PhD; Kimberly Garza, PharmD, MBA, PhD; Jingjing Qian, PhD; Salisa Westrick, PhD

Auburn University, Harrison School of Pharmacy, Health Outcomes Research and Policy
OUTLINE

- Background
  - Need for immunization registries
  - Policies
- Methods
- Results
- Discussion
- Conclusions
As the number of providers administering vaccines increases, there is a concern of fragmented immunization records.

Complete immunization records are necessary:

- Population level
- Point of clinical care
POTENTIAL SOLUTION: IMMUNIZATION REGISTRIES

Confidential computerized databases that record and consolidate immunization doses administered by participating providers within a defined geographic area

- Also referred to as Immunization Information Systems (IIS)

- Core elements
  - Patient name
  - Date of birth
  - Vaccine
  - Date administered
  - Provider

- Help to address the concern of fragmented records
  - IF providers participate!
1993- Legislation proposed to create a NATIONAL immunization registry

When this was rejected, individual states were left to create their own registries
  • Each registry has a unique set of policies

Select policy components:
  • Mandatory participation
  • Patient consent
    • Children
    • Adults
In order for providers, patients, and researchers to have confidence in immunization registries, the quality of data needs to be evaluated.

The literature shows mixed results in comparing the completeness of immunization registry data to both medical and personal records.

Additionally, it is unclear how policies surrounding immunization registries impact the data recorded.
Therefore, the objectives of this study were to:

1) compare completeness of immunization registry data to medical records,

2) compare completeness of immunization registry data to personal records, and

3) explore characteristics of immunization registry policy that may influence completeness.
METHODS

- Design: Systematic literature review
- Data Sources:
  - Medline, PsychINFO, and CINAHL.
  - Additionally, grey literature and reference lists were hand-searched
- Search terms:
  - (((immunization registry) OR (immunization information system)) AND ((accuracy) OR (complete) OR (quality)) AND ((medical record) OR (EMR) OR (EHR) OR (personal record) OR (self report)))
- Two independent researchers
Study Inclusion Criteria:

- Immunization registry compared to either medical or personal records of individuals in the same geopolitical area
- Comparison measures included: % up to date (UTD), % vaccinated, or # vaccines recorded
- Active registry in the United States

Exclusion Criteria:

- Studies using an immunization registry only as a source of data
- Not published in English, and/or not comparing the registry to another data source were excluded
287 records identified through database searching

10 additional records identified through other sources

255 records after duplicates removed

255 records screened

185 records excluded

70 full-text articles assessed for eligibility

10 studies included in qualitative synthesis

No population-based registry (24)
Descriptive/Narrative (7)
No comparison data source (19)
Outside U.S. (5)
Variables not comparable (2)
Full text not available (3)
<table>
<thead>
<tr>
<th>Author and date</th>
<th>State(s)</th>
<th>N</th>
<th>Measure</th>
<th>Immunization Registry</th>
<th>Medical Record</th>
<th>Personal Record</th>
<th>Conclusion^a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irving, 2009³</td>
<td>WI</td>
<td>2907</td>
<td>% vaccinated</td>
<td>94.60%</td>
<td>95.40%</td>
<td>PR&gt;IR</td>
<td></td>
</tr>
<tr>
<td>Hendrickson, 2015⁴</td>
<td>AZ</td>
<td>100</td>
<td>% vaccinated</td>
<td>71.80%</td>
<td>81.90%</td>
<td>87.80%</td>
<td>PR&gt;MRIR</td>
</tr>
<tr>
<td>Stecher, 2008⁵</td>
<td>AZ</td>
<td>332</td>
<td>% UTD</td>
<td>37.00%</td>
<td>57.00%</td>
<td>89.00%</td>
<td>PR&gt;MRIR</td>
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<tr>
<td>Jackson, 2014⁶</td>
<td>WA</td>
<td>486,265</td>
<td># vaccines recorded</td>
<td>475963</td>
<td>478709</td>
<td>MR&gt;IR</td>
<td></td>
</tr>
<tr>
<td>Davidson, 2003⁷</td>
<td>CO</td>
<td>818</td>
<td>% UTD (1993 data)</td>
<td>36.90%</td>
<td>82.20%</td>
<td>MR&gt;IR</td>
<td></td>
</tr>
<tr>
<td>Fuller, 2016⁸</td>
<td>Multiple</td>
<td>119</td>
<td>% UTD</td>
<td>70.90%</td>
<td>73.70%</td>
<td>41.20%</td>
<td>MR&gt;I&gt;PR</td>
</tr>
<tr>
<td>Specker, 2014⁹</td>
<td>SD, MN, NC, WI</td>
<td>325</td>
<td>% vaccinated</td>
<td>24.80%</td>
<td>30.50%</td>
<td>20.10%</td>
<td>MR&gt;I&gt;PR</td>
</tr>
<tr>
<td>Boyd, 2002¹⁰</td>
<td>TX</td>
<td>Not reported</td>
<td>% UTD</td>
<td>64.10%</td>
<td>39.80%</td>
<td>IR&gt;MR</td>
<td></td>
</tr>
<tr>
<td>Davidson, 2003⁷</td>
<td>CO</td>
<td>1043</td>
<td>% UTD (1998 data)</td>
<td>78.90%</td>
<td>57.30%</td>
<td>IR&gt;MR</td>
<td></td>
</tr>
<tr>
<td>Kolasa, 2006¹¹</td>
<td>PA</td>
<td>620</td>
<td>% UTD</td>
<td>80.00%</td>
<td>62.00%</td>
<td>IR&gt;MR</td>
<td></td>
</tr>
<tr>
<td>Koepke, 2015¹²</td>
<td>WI</td>
<td>1863</td>
<td>% UTD</td>
<td>76.50%</td>
<td>49.30%</td>
<td>75.20%</td>
<td>IR&gt;PR&gt;MR</td>
</tr>
</tbody>
</table>

^aIR= Immunization Registry, MR= Medical Record, PR= Personal Record
A 2015 survey of IIS policies was used to determine relevant legislation for each study.\textsuperscript{13}

Legislation for each individual state was reviewed to ensure that policies had not changed after publication of the included studies.

Policy components examined:
- Type of consent required
- Provider participation mandates
TYPE OF CONSENT REQUIRED FOR CHILDREN
TYPE OF CONSENT REQUIRED FOR ADULTS
PROVIDER PARTICIPATION MANDATES
<table>
<thead>
<tr>
<th>Author</th>
<th>State(s)</th>
<th>Conclusion</th>
<th>Mandate</th>
<th>State Legislation</th>
<th>Patient Consent Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boyd, 2002</td>
<td>TX</td>
<td>IR&gt;MR</td>
<td>Yes</td>
<td></td>
<td>Explicit written consent</td>
</tr>
<tr>
<td>Stecher, 2008</td>
<td>AZ</td>
<td>PR&gt;MR&gt;IR</td>
<td>Yes</td>
<td></td>
<td>Children opt out; Adults explicit consent³</td>
</tr>
<tr>
<td>Hendrickson,</td>
<td>AZ</td>
<td>PR&gt;MR&gt;IR</td>
<td>Yes</td>
<td></td>
<td>Children opt out; Adults explicit consent³</td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Davidson, 2003</td>
<td>CO</td>
<td>MR&gt;IR</td>
<td>No</td>
<td></td>
<td>Implicit consent with Opt out</td>
</tr>
<tr>
<td>Irving, 2009</td>
<td>WI</td>
<td>PR&gt;IR</td>
<td>No</td>
<td></td>
<td>Implicit consent with Opt out</td>
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<tr>
<td>Jackson, 2014</td>
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<td>No</td>
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<td>Koepke, 2015</td>
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<tr>
<td>Kolasa, 2006</td>
<td>PA</td>
<td>IR&gt;MR</td>
<td>No</td>
<td></td>
<td>Implicit consent with Opt out</td>
</tr>
<tr>
<td>Specker, 2014</td>
<td>SD, MN,</td>
<td>MR&gt;IR&gt;PR</td>
<td>No</td>
<td></td>
<td>Implicit consent with Opt out (SD, MN, WI); Mandatory with no right to opt out (NC)</td>
</tr>
<tr>
<td></td>
<td>NC, WI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Except for immunizations administered by pharmacists, for which there is implicit consent with opt out.*

*IR = Immunization Registry, MR = Medical Record, PR = Personal Record*
DISCUSSION

• The findings of this systematic review show that immunization registry data was more complete than medical records in only 4 of the 9 comparisons.

• When comparing registry data to personal records, 3 of 6 studies showed immunization registry data to be more complete.
DISCUSSION

• Within the three studies including states with mandatory reporting, two of these found immunization registry data to be less complete than both medical and personal records.

• Only one study took place in a state requiring explicit consent. This study found immunization registry data to be more complete than medical records.

• The policies surrounding individual immunization registries may not be implemented and translated into practice consistently.

• More data is needed to evaluate the completeness of immunization registries.
LIMITATIONS

- Difficult to assess and compare measures of completeness across studies
- Clarity of vaccines included
- Variability in legislation surrounding immunization registries makes it difficult to consolidate and compare data across states
- The findings of this study may not be generalizable to other immunization registries within and outside the United States
More research is needed to assess the completeness of immunization registry data in comparison to other sources of immunization information.

Factors other than legislation may play a role in immunization registry data completeness and need to be considered.
REFERENCES


