Estimating the True Burden of Reportable Disease Fatality in Indiana

Anne Reynolds, MPH\textsuperscript{A} and Ann Kayser, MPH\textsuperscript{B}

Background

- Newly diagnosed cases of notifiable conditions include case vital status (i.e. deceased)
- Additional cases may be identified from death certificates
- A previous study found completeness of reporting, augmented with death records, increased about 30\%\textsuperscript{1}, however, the true burden is unknown.

Objectives

- Identify whether cases of specific reportable diseases with reported deaths were correctly reported on death certificates.
- Identify if reportable diseases were listed on death certificates as causes of death, but not reported.

Methods

- Cross-Sectional Study, 2012-2014 deaths
- Case investigations from Indiana’s Electronic Disease Surveillance System (I-NEDSS) – confirmed and probable case status, identified with deceased vital status
- Death certificates from Indiana Death Registration System (IDRS) – identified by ICD-10 mortality codes
- All cases from both systems were searched for a match by name, date of birth, date of death
- Three I-NEDSS Reportable Conditions
  - Influenza-Associated Deaths (Flu)
  - Streptococcus Group B Invasive Disease (GBS)
  - Streptococcus pneumoniae, Invasive (SPN)

Results

- I-NEDSS search identified 494 case investigations for the selected conditions indicating deceased vital status
- IDRS search identified 374 deaths coded for one of the selected conditions
- Matched case investigations and death records were identified for 147 deaths (128 flu, 19 SPN, 0 GBS)
- Additional 22 cases identified in IDRS, but not identified as deceased or were not a case in I-NEDSS case investigation
- Matched deaths accounted for 39.3\% of originally identified records

Conclusion

- SPN fatalities were three times more likely to be reported in I-NEDSS
- Influenza fatalities were 0.5 times more likely to be reported in IDRS
- Death certificates act as a supplement to case investigations to identify the burden of reportable disease fatality.

Discussion

- Expand study to all reportable conditions
- Identify any death certifiers failing to report in I-NEDSS

Limitations

- Spelling & abbreviations used to report cause of death
- Bias towards sickest individuals
- ICD-10 mortality code assignment
- Out-of-state residence & out-of-state death
- Assume death records meet case definitions, producing false positives

Table. Capture-Recapture Estimation of Fatal Cases

<table>
<thead>
<tr>
<th>Condition</th>
<th>Est. No. Fatal Cases</th>
<th>95% Cl of Est.</th>
<th>I-NEDSS Sensitivity, %</th>
<th>IDRS Sensitivity, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flu</td>
<td>447</td>
<td>413-481</td>
<td>43.2</td>
<td>66.2</td>
</tr>
<tr>
<td>SPN</td>
<td>847</td>
<td>536-1,157</td>
<td>27.5</td>
<td>8.1</td>
</tr>
<tr>
<td>Study Conditions</td>
<td>1,257</td>
<td>1,125-1,390</td>
<td>39.3</td>
<td>29.8</td>
</tr>
</tbody>
</table>

References