

Estimating the True Burden of Reportable Disease Fatality in Indiana

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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%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

Figure. Deaths Reported to I-NEDSS and Deaths Found by ICD Code Search in IDRS

		I-NEDSS	
		Marked as Death	Not Marked as Death
IDRS	Found in ICD Search	147	224
	Not Found in ICD Search	347	?

- I-NEDSS alone identified 39.3% of the estimated fatalities from the three study conditions
- Augmentation with death records increased identification to 57.1%

Table. Capture-Recapture Estimation of Fatal Cases

Condition	Est. No. Fatal Cases	95% CI of Est.	I-NEDSS Sensitivity, %	IDRS Sensitivity, %
Flu	447	413-481	43.2	66.2
SPN	847	536-1,157	27.5	8.1
Study Conditions	1,257	1,125-1,390	39.3	29.8

Conclusions

- 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

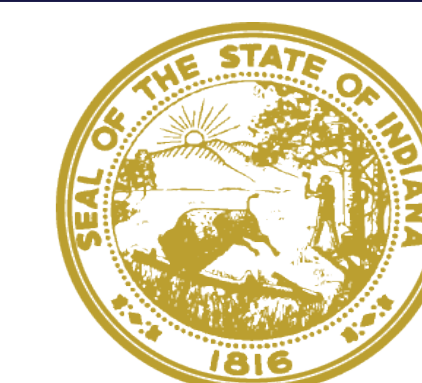
- Expand study to all reportable conditions
- Identify any death certifiers failing to report in I-NEDSS

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

References

- Oltean, Hanna N., DeBolt, Charla A., Goldoft, Marcia J., & Lofy, Kathryn H. (2015). Use of death records to augment notifiable conditions reporting in Washington state. *J Public Health Management Practice*, 1-7.



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