

Validation Of Mortality Information From A Real-world Data Source: Can Administrative Claims Alone Be Trusted?

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Study Summary

Study Question: To evaluate validity of death information coming from employer-based sources relative to the National Death Index (NDI)

Study Design:

Random sample of 6,000 adults from the MarketScan Commercial Claims and Encounters Database

Identify deaths in MarketScan (MSN) data

Identify deaths in National Death Index (NDI)

Validate MSN-identified deaths compared with NDI deaths

Conclusion: Employer-provided death data provides accurate mortality information but may need to be supplemented with other sources to be comprehensive.

Study Results: Accuracy of MSN-identified Deaths vs. NDI

	Observed Value (95% CI)
Negative Predictive Value	86% (85%, 87%)
Positive Predictive Value	93% (91%, 94%)
Specificity	99% (98%, 99%)
Sensitivity	54% (51%, 56%)
Date concordance (% within 1 day)	96.9%

Background

- Mortality data is leveraged in multiple ways in pharmacoepidemiologic research, including assessment of survival, establishing the end of patient follow-up, and defining specific outcomes (e.g., non-fatal stroke).
- Identifying a reliable source of mortality data using Real-World Data (RWD) is challenging due to variability in the validity, granularity, and comprehensiveness of data across sources impacting study conclusions.^{1,2}

Objective

- To validate death information coming from employer-based sources relative to that contained in the Centers for Disease Control and Prevention's National Death Index (NDI).

Methods

Data Source

- Administrative claims data from the Merative™ MarketScan® Commercial and Medicare Database (MSN) linked to the NDI.
 - Death data in MarketScan includes day, month, and year of death derived from inpatient discharge status and employer-reported outpatient deaths.
 - Death data in the NDI includes day, month, and year of death derived from death certificates provided by vital records offices.

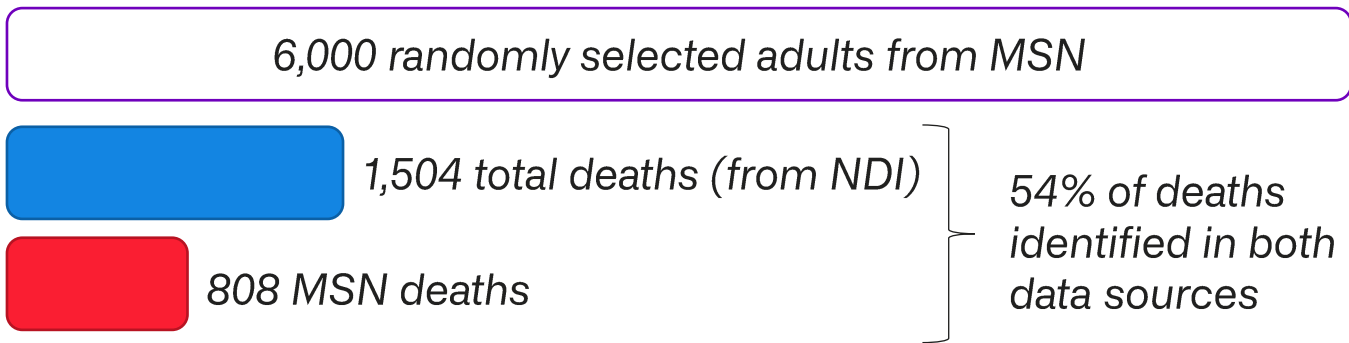
Study Design and Outcomes

- A random sample of 6,000 adults whose employer-sponsored insurance benefits ended during the 2019 or 2022 calendar years were selected in the MarketScan Database and linked to the NDI.
- Individuals who died in each calendar year were identified within both the NDI and MSN data sources; the date of death was also extracted.
- NDI reported deaths were considered the “gold standard” for validation of MSN deaths.
 - Sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of MarketScan based deaths was assessed.
 - Concordance between the death date was also evaluated.

Results

- Of the 1,504 deaths identified in the NDI data, 808 (54%) were also identified using MSN data (Figure 1).

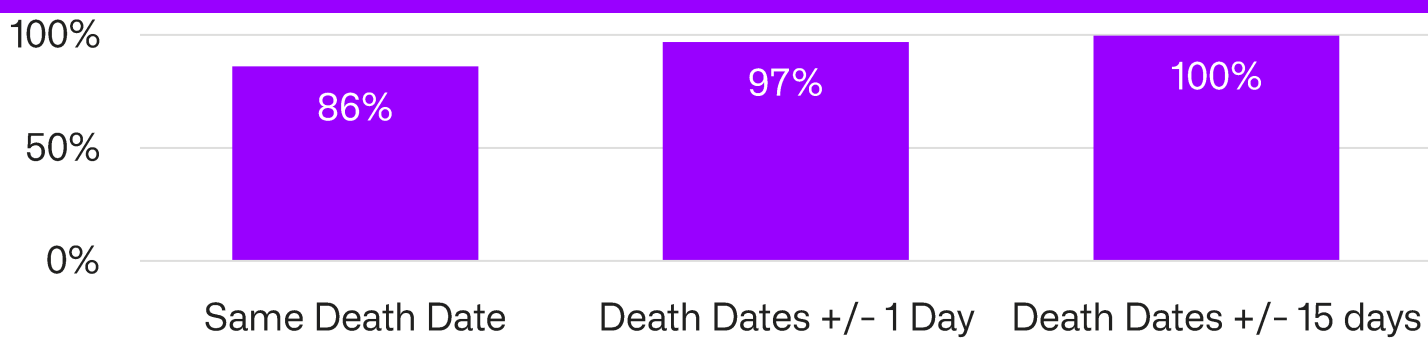
Figure 1. Deaths identified in NDI and in MSN data



Results, continued

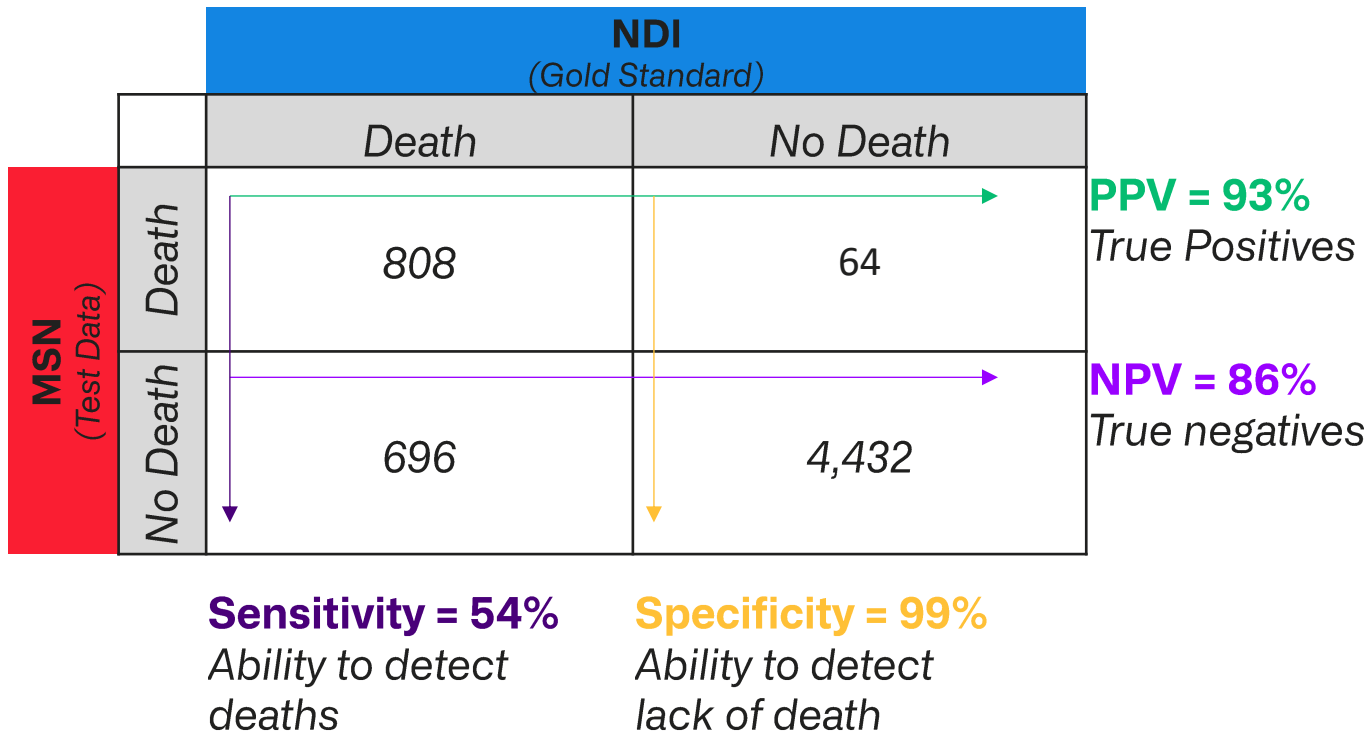
- For the 808 deaths in both databases, date of death in MSN was within +/- 1 day of the NDI for 97% (Figure 2).

Figure 2. Concordance between MSN and NDI Death Dates



- Compared with the NDI, death information available in MSN was accurate as evidenced by a high PPV and NPV (Figure 3).
- Although specificity was also high, sensitivity was moderate indicating that death in MSN could be more comprehensive (Figure 3).

Figure 3. Validation of MSN Deaths



Limitations

- The study sample was composed of a randomly selected population of adults and may not generalize to specific populations (e.g., pediatrics, oncology patients, etc.).

Conclusions

- Death information captured through employer supplied data is accurate with a high degree of NPV, PPV and specificity.
 - Provided dates of death also have high concordance to NDI provided date of death.
- However, employer provided death data is not completely comprehensive and provides modest sensitivity.
 - Inclusion of secondary death data sources, such as the Social Security Death Master file, could be considered to help increase the comprehensive capture of death.

References

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Disclosure

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