2022 NPCR WISCONSIN SUCCESS STORY

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Evaluation of Death Clearance Casefinding Based on Hospital Discharge Records

National Program of Cancer Registries
S U C C E S S   S T O R Y

SUMMARY

Given unreported case candidates from death certificates ('candidates'), hospital discharge records were used to assign candidates to reporting facilities ('queries'). Seventy-five percent of these queries resulted in resolution of the status of the candidate on the first round. This result is a substantial improvement over success rates (less than 40%) prior to use of discharge records.

CHALLENGE

As part of the NAACCR death clearance process, reporting facilities are asked to review unreported case candidates; ICD-10-CM case finding codes found in death certificates that (based on the NAACCR death clearance guidelines) cannot be definitively linked to a reported case. For each candidate, we want to choose a reporting facility to query. Reporters are asked to submit a case abstract (*Abstract*), alternatively, provide information that classifies the case as previously reported (*Submitted*), unreportable (*Unreportable*) or otherwise remaining unresolved because they do not have enough information (*Unresolved*).

The challenge is successful and efficient assignment of candidates to reporting facilities. Our first objective is to quantify our success in choosing reporters who have information about a candidate. We count the number of queries in each of the four classes. Success of reporter selection is quantified based on the proportion of codes that are resolved on the first query:

$$Proportion\ Resolved\ =\ (\#Abstract\ +\ \#Submitted\ +\ \#Unreportable\ )/\#Query$$

where '#' refers to the number of queries in the class and $\#Query = \#Abstract + \#Submitted + \#Unreportable + \#Unresolved$.

Our second objective is to quantify efficiency in asking for effort from reporters. To clarify, each candidate requires reporter effort; we are inefficient with reporter effort if we ask them about cases they have already reported or about which they have no information. We quantify the efficiency in asking for reporter effort:

$$Efficiency\ =\ (\#Abstract\ +\ \#Unreportable)/\#Query$$

We use hospital discharge data to assign candidates to reporters. Our third objective is to describe the richness of discharge information in the cancer case finding context. For example, discharge data is rich if a high proportion of decedents link to reporters via discharges. Discharge data is richer if the same high proportion links to cancer-related encounters. We describe the distribution, among decedents, of all discharges as well as of cancer-relevant discharges. More precisely, we report the cumulative distribution of discharge counts:

$$Proportion\ of\ Decedents\ (N\ Discharge\ Records)$$
$$=\frac{Number\ of\ Decedents\ with\ \leq N\ Discharge\ Records}{Total\ Number\ Decedents}$$

SOLUTION

The solution is to assign a candidate to a reporting facility based on the decedent's clinical encounter history. A candidate has a time interval to the extent that it has a precise end date (date of death) and, optionally, a duration expressed in natural language (e.g., '1 month'). In this case finding context, an encounter is a date, a diagnostic code, and optionally a reporting facility (for example, a diagnosis does not have a reporting facility and a healthcare provider may or may not be associated with a cancer reporting facility). Our representation of decedent clinical encounter history (Figure 1) comprises 1) diagnosis, 2) abstract submission, 3) in-state discharge, and 4) death. A Certified Tumor Registrar reviews these data in tabular form and selects a reporter.
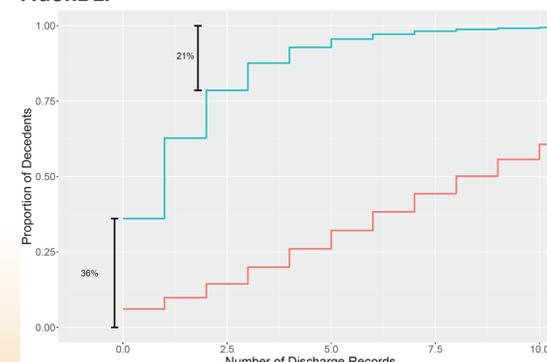

FIGURE 1.

Decedent event history example (anonymized based on an actual example). Boxes are events (cancer diagnosis, hospital discharge, cancer abstract, or death. The death certificate included references to both lung and gallbladder cancers (the latter with a duration of '1 month'). Facility A was chosen for follow-back based on the duration and reference to 'Other liver diseases.' Facility A responded with a promise to submit an abstract for the gallbladder cancer, clarified that the lung cancer was in fact a new reportable case (not a metastasis), and pointed us to B (our second choice based on the earlier abstract for 'Prostate') for an abstract on the lung cancer diagnosis.

RESULTS

Of 1274 responses to queries, 695 are commitments to submit case abstracts, 45 were linked to previously submitted abstracts, 211 were unreportable, 309 remain unresolved, and 59 were not assigned to a class. These counts correspond to a success rate of 75% and an efficiency of 71%.

FIGURE 2.

Death clearance-relevant information in hospital discharge records. The distribution of the number, N, of all (red) and cancer (blue) discharge records among decedents with leads, expressed as a cumulative distribution: the number of decedents with less then, or equal to, N discharge records. For example, 36% have no cancer discharge while 21% have more than two such records (black bars).

SUSTAINING SUCCESS

Commitments to data modernization within our Office of Health Informatics will sustain these linkages. Our high success rate in resolving candidates provides important information about tumors that are under-reported. We can use this information to efficiently target efforts that improve completeness. More generally, we expect that the detailed event histories that result from data integration will prove useful a wide variety of contexts. For example, linkages may uncover previously unknown comorbidities.

STORY QUOTE

"By comparing unreported case candidates against facility and hospital discharge diagnoses, staff were able to identify a reporting facility that, with high probability, would have information necessary to resolve the candidate cancer case. This process reduced the number of missed cases as well as the need for a second round of follow-back." – Nancy Sonnleitner, RHIT, CTR, WCRS Education and Training Coordinator.

REGISTRY CONTACT INFORMATION

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