ISDS 2015 Conference Abstracts

Resolving Disconnected Patient Records to Support Patient Care and Population Health

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Introduction

Population health relies on tracking patients through a continuum of care with data from disparate sources. An assumption is made that all records of a patient from all the sources are connected[1]. As was realized during the process of operationalizing algorithms for population health, not all patient records are connected[2]. Disconnected records negatively impact results: from individual patient care management through population health's predictive analytics[3,4]. An enterprise master patient index (EMPI) system can be employed to connect a patient's records across disparate systems[5], but it requires comprehensive tuning to maximize the number of connected records. This presentation describes how one large healthcare integrated delivery network tuned their EMPI system to maximize the number of connected patient records across all sources.

Methods

Several methods were employed to reduce the number of disconnected records. The 5 sources containing the most disconnected records were chosen from the 32 sources of data in the system that represented 10.5 million records. Retention rules were developed for removing records from the EMPI database that did not meet the criteria for retention and those records were removed. Using sampled data, the weighting factors applied to the data elements used to determine a score to allow the EMPI system to link records together (autolink), and the score at which an autolink occurs were reconfigured to allow the EMPI system to link more records. The matching algorithm was enhanced for combining the patient records into a single entity for sources that were sending a high rate of duplicate patient records with differing patient IDs and identical demographics. A cross-matching function was executed to force the re-evaluation of all the linkages between all the records within the EMPI database. The Data Stewardship Team used the Delphi method to determine false positive and false negative rates.

Results

The number of disconnected records was reduced by 99.8% (Tables 1, 2, 3).

Conclusions

An IDN can employ several tactics to address unmatched patient records across multiple sources without manually reviewing all patient records for possible matches. This project represented the first pass of data standardization and reconciliation. During project execution, additional data quality issues were discovered. This led to a number of follow-on interventions, such as the development of a new source on-boarding policy, development of a go-live data validation checklist, inclusion of third party software to validate addresses, and developing guidelines for reducing data errors and the number of duplicate patient records sent to the EMPI system at patient intake.

Table 1. EMPI Drop Records Statistics

Advocate Source of Information	Records Original	Records Dropped	Records Reloaded Back Into EMPI System	Records Remaining Per Source	Number of Disconnected Records Before Drop	Number of Disconnected Records After Drop
Source 1	1,899,469	1,899,469	267,645	267,645	3,277,289	2,048,322
Source 2	122,519	122,519	-	0	2,048,322	2,035,808
Source 3	283,259	22,678	-	260,581	1,982,819	1,979,287
Source 4	233,058	94,444	-	138,614	1,979,287	1,973,809
Source 5	2,045,208	662,731	-	1,382,477	1,920,652	1,859,692
Total	4,583,513	2,801,841	267,645	2,049,317		

Table 2. EMPI Cross-Match Statistics

Source	Number of Disconnected Records Before Cross-Match	Number of Disconnected Records After Cross-Match
All Sources	1,859,692	396,569

Table 3. EMPI Final Statistics

Source	Starting Number of Disconnected Records	Ending Number of Disconnected Records	Percent Reduction
All Sources	3,277,289	396,569	99.8%

Keywords

Enterprise Master Patient Index; Patient Data Linkage; Data Governance

References

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