Mapping Laboratory Test Codes to LOINC for a Regional Health Information Exchange

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Abstract
Fully mapping laboratory tests to LOINC greatly increases functionality within a regional data exchange, but it is a costly process. As an inexpensive approach, we defined 53 “clinically significant” labs to map within the Memphis, Tennessee RHIO. These tests comprised a small percentage of unique test codes but a large percentage of laboratory message volume. We propose mapping a few clinically significant laboratory tests can deliver a low cost increase in functionality for a RHIO.

Background
The Logical Observation Identifier Names and Codes (LOINC) standard is used to match observation codes among disparate systems to a single standard code set for data exchange purposes. The standard has grown to include over 40,000 unique LOINC observation codes with a large majority being laboratory codes. To use the LOINC standard, a mapping from local observation codes to matching LOINC codes must be created.

The Midsouth eHealth Alliance (MSeHA) is a regional data exchange organized as a Regional Health Information Organization (RHIO) composed of 9 healthcare organizations servicing the Memphis, Tennessee area. The MSeHA receives pharmacy claims data from Memphis Managed Care Corporation along with various amounts of laboratory results, radiology text reports, cardiology studies, and other dictated reports from 13 of the 15 participating hospitals. Over 90,000 laboratory messages are sent each day from 7 laboratory systems. Currently, clinicians use the user interface provided by the MSeHA in the Emergency Departments (EDs) of 3 participating hospitals.

Using the LOINC standard improves the utility of a regional data exchange by enabling aggregated views of similar laboratory tests across multiple systems. Due to a lack of a true need, many of the participating organizations have not been motivated to create LOINC mappings. In order to provide needed functionality, the MSeHA has committed to mapping a portion of the most needed lab tests.

Methods
In order to use LOINC effectively while avoiding mapping the entire set of unique test codes sent to the MSeHA, a clinical work group identified 53 clinically significant tests for the ED. The test codes from each lab system corresponding to these tests were then mapped to 61 different LOINC codes.

A message volume analysis was then performed using archived laboratory messages collected during February, 2007. This produced a vocabulary of test codes for each lab system and the volume of each test code calculated as the number of messages received with that code, including update messages.

Results
During the sample period, 2,656,945 laboratory messages with 4,790 distinct test codes were received by the MSeHA. The test codes corresponding to the 53 LOINC mapped tests comprised 7.6% of the total number of unique test codes and 54.9% of the total message volume over the sample period. The 53 highest volume test codes from each lab system were compared to the 53 most significant tests identified by the clinical workgroup. 58% of the high volume tests were previously identified as clinically significant.

Conclusion
Clinically important laboratory tests account for a small percentage of total test codes and a large percentage of laboratory message volume. Mapping the most clinically significant test codes to LOINC maps a large amount of the message volume offering a cost effective way to increase functionality within a regional data exchange. Additionally, a clinical workgroup can use a message volume analysis to aid identification of clinically significant tests.

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