

# The Map to LOINC Project

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**Abstract:** We describe a pilot project to standardize local laboratory test names to Logical Observation Identifier Names and Codes (LOINC) at five Indian Health Service (IHS) medical facilities. An automated mapping tool was developed to assign LOINC codes. The laboratory test names not mapped to LOINC by the mapping tool were assigned LOINC codes manually. The results achieved matched current benchmarks.

**Background:** Public health information systems are increasingly moving toward automated capture and analysis of data, use of data that are already electronic, and integration of public health and healthcare information systems. Laboratory data is becoming an increasingly valuable tool for public health agencies<sup>1</sup> but code sets for laboratory test names may be different from one information system to another, complicating data aggregation. A solution is to map the local test names from these systems to a standard set of codes, LOINC.<sup>2,3</sup>

A collaborative pilot project was undertaken by the Centers for Disease Control and Prevention (CDC) and IHS to design and test a semi-automated process to standardize local laboratory tests names to LOINC at five IHS medical facilities. IHS facilities use an integrated clinical and administrative information system, the Resource Patient Management System (RPMS). This system consists of more than 35 different applications. The “Lab Package” is used for laboratory records.

**Objective:** The main objective of this pilot project was to map local laboratory test name files to LOINC, using an automated mapping tool, and then to manually map any tests that remained uncoded after the automated mapping procedure. The process was designed to accommodate future changes in laboratory test names/codes; to meet all data security and confidentiality standards; and to be easily expandable to other IHS medical facilities in future.

**Methods:** The laboratory test names and synonyms along with the test units, and specimen sites of the tests, were downloaded from the five participating IHS sites. Only the details of tests in active use at the sites were gathered. These datasets were combined to create a master file. LOINC codes were assigned manually to the tests in the master file by agreement of two scientists. The Regenstrief LOINC Mapping Assistant (RELMA) was used to identify the LOINC

codes for tests. Manual review revealed tests with incomplete or incorrect information, subsequently marked as “uncodeable.” Panel tests with no corresponding LOINC codes were excluded from the master file. An automated mapping tool was developed for mapping local laboratory test names to LOINC using the master file. Tests not assigned a code by the mapping tool were reviewed manually and codes were assigned, if possible.

**Results:** At each of the five sites, we were able to map 63% to 76% of the local active laboratory tests to LOINC using the mapping tool; 11% to 27% of the tests were mapped manually. We could not assign LOINC codes to 7% to 19% of the laboratory tests due to incomplete or incorrect information about these tests. To validate the performance of our mapping tool, we tested it on a laboratory test file from a facility that did not participate in the pilot project. Of 703 local laboratory tests in this file, we were able to map 569 (81%) of the tests to LOINC.

**Conclusions:** By using this semi-automated process, we were able to standardize more than two-thirds of the laboratory data to LOINC, matching the most successful reported efforts to date.<sup>4</sup> The results from the facility that did not participate in the tool development phase suggest that this semi-automated process will achieve comparable results if expanded to other IHS medical facilities. Improvement in quality of data will increase the percentage of tests mapped in future.

## References

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