Construction of a dictionary of laboratory tests mapped to LOINC at AP-HP

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Abstract
We report on the ongoing process implemented at Assistance Publique-Hôpitaux de Paris (AP-HP), the largest hospital system in Europe, to build a common reference for laboratory tests in French with LOINC mappings. At the time of writing, it contained 24,000 tests, covering all fields of biology, in use in 19 AP-HP hospitals, 30% of which had a mapping to LOINC with a peak of over 60% in biochemistry.

Introduction
The exchange of laboratory test results between health care professionals must be based on a shared vocabulary. A master dictionary of laboratory tests is a key element in the workflow and information exchange between order entry and laboratory systems. Several classifications and nomenclatures have been proposed for laboratory tests (C-NPU, Euclides, Names-Lab, LOINC, CUMUL,...). Logical Observation Identifiers Names and Codes (LOINC) being now the nomenclature with the strongest international development, it was chosen by Assistance Publique-Hôpitaux de Paris (AP-HP), the largest European hospital system, as a standard for exchange with outside actors.

The goal is to have a master laboratory test dictionary common to all laboratory systems in the 180 laboratories of the 40 hospitals of AP-HP. This dictionary must be independent of laboratory systems. Each test must map to a LOINC code. The master dictionary must be maintained to ensure compatibility as LOINC is updated.

A growing master dictionary of laboratory tests performed in AP-HP laboratories has been initiated and mapped to the successive versions of LOINC laboratory codes since 2005. The translation into French labels is provided in a coordinated manner by the French Society for Laboratory Information (SFIL) and AP-HP. This translation focuses on the laboratory tests performed in AP-HP hospitals.

Since LOINC does not cover all current needs of AP-HP, requests for creating LOINC codes and tests are regularly sent to the Regenstrief Institute. When approved, the new codes are incorporated into the AP-HP dictionary and the next version of LOINC.

The comprehensive compilation of AP-HP laboratory tests is done with biologists gathered in colleges by discipline (biochemistry, hematology, immunology, pharmacology, toxicology, microbiology, molecular biology), whose mission is to reach a consensual denomination. Tests obtained in this compilation are sometimes more granular than those of LOINC: additional attributes are added in some cases either because of laboratory practice, or because of laboratory system constraints. This motivated in some instances the mapping of a common LOINC code to several more specific tests of the AP-HP test dictionary.

In early 2008, 19 AP-HP hospitals were involved in the implementation of the master test dictionary. It contained 24,000 tests, 30% of which had a mapping to LOINC. This rate was variable with the disciplines: from over 60% in biochemistry to around 25% in hematology and immunology. Multiple mappings to LOINC codes occurred for 5% to 20% of the tests depending on the discipline. Besides, 5% to 15% of AP-HP master dictionary entries will have no LOINC mapping because they are comments, interpretations and other laboratory-system-dependent needs which do not fit the LOINC model.

This vast project to harmonize the description of laboratory tests and obtain a common master dictionary for laboratory systems first has internal value for the institution. Its mapping to an international nomenclature such as LOINC receives full benefit with data exchange with other agencies or with external health professionals.

This work developed by AP-HP highlights the need and value of cooperation between various organizations. Effective now between AP-HP, SFIL and the Regenstrief Institute, this cooperation is expected to spread within the Francophone world.

References