X-eHealth project proposes the use of SNOMED CT as candidate terminology to exchange electronic health records for lab

Cátia Pinto, Sérgio Dinis, Flávio Soares | Serviços Partilhados do Ministério da Saúde, EPE (SPMS)

Abstract

- X-eHealth is an EU-funded Cooperative and Support Action (CSA) aiming at promoting a faster and sustainable European Union digital transformation. The project's main goal is to create the foundation for a usable, interoperable, secure, and cross-border Electronic Health Record Exchange Format (EEHRxF), which will contribute to a future adoption of a European eHealth governance framework and ICT infrastructures.

- The importance of sharing cross-border clinical laboratory results for diagnosis, treatment and follow-up of patients cannot be overstated. As the exchange of laboratory orders and results is currently not a supported use case by the existing infrastructure, the SNOMED CT terminology is being explored here as an option for the coded representation of several facts related with the laboratory domain. The goal is to integrate the new EEHRxF domain at the national level and for the cross-border eHealth services (eHDSI).

X-eHealth
Exchanging Electronic Health Records in a common framework

X-eHealth CSA, Grant Agreement 951938

SNOMED CT EXPO 2022
Sept 29-30, 2022 × Lisbon, Portugal

Introduction

Health Data Interoperability and the European Commission's Vision

- The lack of interoperability is the most persistent barrier to the deployment of the digital health services and a major factor impeding investments in digital health infrastructures. Well-implemented and interoperable eHealth services used by health professionals and citizens have the potential to make a significant societal contribution towards improving healthcare while also providing a high socioeconomic return.

- The digital transformation of health and care is one of the European Commission's top priorities. Recognizing the potential of digital health and care to innovate and improve overall healthcare efficiency, the X-eHealth CSA intends to contribute to the European Commission's Digital Single Market Strategy. In this line, the announced European Health Data Space (EHDS) features a legal, governance, data quality, and interoperability architecture that intends to improve health care delivery, research, and policymaking by facilitating access to and reuse of health data. However, many challenges are being already identified, such as lack of data interoperability, fragmented laws for the use of health data and individuals facing hurdles to access and control their own health data.

X-eHealth project proposes the use of SNOMED CT as candidate terminology to exchange electronic health records for lab

Cátia Pinto, Sérgio Dinis, Flávio Soares | Serviços Partilhados do Ministério da Saúde, EPE (SPMS)

The X-eHealth Scope

- Working towards a common federated data space presents challenges both general and specific, which requires synergized solutions. The overall vision of X-eHealth is to contribute to a future European Union with integrated health processes, in which the health record of every European citizen can be immediately accessed in any Member State with the European Electronic Health Record Exchange Format (EEHRxF). On this basis and building upon the already running eHealth Digital Service Infrastructure (eHDSI) infrastructure (Patient Summary and ePrescription/eDispensation services), X-eHealth is defining Generic Aspects to the System Architecture and Integration, as well as the Functional and Technical Requirements for the following new use cases: 1) Laboratory Results, 2) Medical Imaging and Reports, 3) Hospital Discharge Reports and 4) Rare Diseases.

Medical Imaging

Discharge Letters

Laboratory Results

Rare Diseases

The role of SNOMED CT

- Based on the identified use cases, X-eHealth intends to develop a set of clinical and functional requirements and definitions for the Laboratory Domain. It includes the logical definition of the required data elements and data structures, as well as the specification of links to the terminologies required for Laboratory Orders and Reports in the selected subdomains considered essential for cross-border EHR exchange. Several existing national conventions for coding laboratory results, including SNOMED CT, are being reflected as viable starting points towards European laboratory data harmonization.

- The safe and successful exchange of test results between different healthcare facilities requires a standardized terminology, a challenge which is even greater when the ultimate goal is a cross-border implementation. The member states of the European Union do not collectively implement a single terminology, or a universal laboratory data interoperability protocol. X-eHealth's laboratory domain requires a mapping of terminologies that can be integrated in a cross-border, wide-ranging implementation of electronic health record sharing. Since SNOMED CT is the most extensive terminology, it can be implemented to represent most cases of coded laboratory test result facts. It has also already been adopted by many EU countries, and whilst SNOMED CT is only one of several terminologies being used in European Union countries, it is widely recognized by European healthcare and laboratory professionals as one of the most disseminated and recognizable terminologies.

snomedexpo.org
SNOMED CT EXPO 2022
Sept 29-30, 2022 × Lisbon, Portugal

Methods

X-eHealth project proposes the use of SNOMED CT as candidate terminology to exchange electronic health records for lab

Cátia Pinto, Sérgio Dinis, Flávio Soares | Serviços Partilhados do Ministério da Saúde, EPE (SPMS)

EEHRxF and SNOMED CT

- SNOMED CT has coded result values which allow for the coding of non-numerical laboratory result data, which by default, cannot be represented directly by a numeric value. For example, SNOMED CT code 761983013 corresponds to Staphylococcus aureus, concepts such as “negative”, “grade 1”, or “on empty stomach” are also coded in SNOMED CT, and it is also capable of describing non-human concepts.

- This added versality allows for the coding of laboratory facts that may not be featured in other terminologies. Consequently, some users of other terminologies (such as LOINC and NPU) have adopted SNOMED CT to successfully fulfil this task. EU wide standard test result units should be agreed upon, and a test code system (or a set of test code systems) should be selected. A mapping of different terminologies may be needed for the exchange of laboratory information across EU countries, and SNOMED CT has features and advantages that are able to respond to specific challenges and roles in this regard.

- SNOMED CT has coded result values which allow for the coding of non-numerical laboratory result data, which by default, cannot be represented directly by a numeric value. For example, SNOMED CT code 761983013 corresponds to Staphylococcus aureus, concepts such as “negative”, “grade 1”, or “on empty stomach” are also coded in SNOMED CT, and it is also capable of describing non-human concepts.

- This added versality allows for the coding of laboratory facts that may not be featured in other terminologies. Consequently, some users of other terminologies (such as LOINC and NPU) have adopted SNOMED CT to successfully fulfil this task. EU wide standard test result units should be agreed upon, and a test code system (or a set of test code systems) should be selected. A mapping of different terminologies may be needed for the exchange of laboratory information across EU countries, and SNOMED CT has features and advantages that are able to respond to specific challenges and roles in this regard.

X-eHealth project proposes the use of SNOMED CT as candidate terminology to exchange electronic health records for lab

Cátia Pinto, Sérgio Dinis, Flávio Soares | Serviços Partilhados do Ministério da Saúde, EPE (SPMS)

Building for the Laboratory Domain

- Information must be shared, merged, and reused for the healthcare process to run well, making health data interoperability a practical need of high importance. Shareable information also means reusable information, for scientific research, discharge letters, decision support, financial-, management- and quality reporting. Thus, the mapped requirements (uses cases and terminologies such as SNOMED CT) would be used as the basis to build a set of implementable specifications for the Laboratory Domain.

Conclusions

- Ultimately, the X-eHealth project aims to create architecture guidelines for an easier adoption/implementation of the new EEHRxF domains and use cases by the different Member States within their country and, also cross-border, into the already in place eHDSI used for the ePrescription and Patient Summary.