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Health Informatics — Terminology resource map quality measures (MapQual)

bsi.

National foreword

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 215, *Health Informatics*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

0.1 General

Healthcare organizations and software vendors are increasingly using maps to convert data from one code system to another code system. In the past, data in health information systems was largely used for organizations' administrative planning and decision making. Data captured in Electronic Health Records (EHR) systems for patient care has a significant impact on patient safety. The use of this data as the source of data for other purposes and for information exchange in clinical care through the use of information technology is an emerging problem. Where that data is translated through maps from one code system to another, the safety and quality issues associated with data use can be significant. The increasing use of maps is costly.

The objective of this work is to support the definition of quality requirements for map sets to

a) establish standard quality conformance requirements for a map for a purpose,

b) assess the quality of a map for a purpose,

c) guide decision makers in map project requirements and processes, and

d) establish pathways to improvement.

Maps are widely used but the quality of these maps cannot be accurately and consistently assessed and compared against their intended use. It is not currently possible for decision makers to assess whether a map will be worth the cost of building and whether the scope and map processes will deliver a map which is able to meet the intended business case.

This document is based upon ISO/TR 12300[1]. Some terminological resources are so different in their content and purpose that they will never map closely to a resource designed and structured differently. Therefore, the decision maker might need to consider whether to map at all or to move to a new terminological resource.

Quality measures consider a wide range of requirements and processes relevant to the creation and maintenance of data maps and their use (including manual and tool-based mapping), as well as for the map sets delivered as a result of using that process.

0.2 Stakeholders and audience

This document is focused on the needs of

a) implementers and software vendors developing and implementing maps sets,

b) health information and data managers developing and using maps sets,

c) data users such as researchers, government, decision makers, and

d) developers of map sets including all in mapping teams including terminologists, coders, clinical users, epidemiologists and statisticians, project managers.

Additionally, the target audience for this document might include

— procurement officers who establish requirements of map product capacity and quality, or

— decision makers to determine and assess resources needed in projects and services associated with map produce, maintenance or use.

0.3 Challenges of mapping

Healthcare organizations and software vendors are increasingly using maps to convert data from one terminological resource to another terminological resource. In the past, data in health information systems was largely used for organizations' administrative planning and decision making.

Today, maps are being used for a much broader range of use cases and the challenges of their use include the following:

a) Map purpose — a map built for one purpose might or might not suit use for other purposes. It is important to establish the purpose and use of a map at the beginning of a project to ensure the best result when building a map from a source code to a target code. When the purpose changes, the resultant map content is likely to need to be different.

b) Map accuracy — there are three broad aspects to accuracy. The first is whether the map development and maintained. The second is how closely the results of applying the map deliver an outcome consistent in meaning to that of original source data. The third is the ability of the outcome of the map to be used for the purpose intended.

c) Map effectiveness — Information retrieval is a critical functionality of maps.

The actual consequence of assigned map links imposed between terms of different code schemes impacts the effectiveness of information retrieval searches. Map purpose and accuracy might both impact the potential safety and appropriateness of the use of that map in healthcare. If the original meaning is changed through use of a map, this might impact clinical safety. There is also the consideration of whether the map is applied consistently to defined data elements in the health record. The data element in which the original source data is recorded might add meaning to the code allocated (e.g. family history of condition versus clinical diagnosis of the individual).

Another significant issue is the cost of creation and maintenance of a map and the ongoing risk and difficulties of maintaining currency of the map.

More information on this topic is available in ISO/TR 12300.

If map quality is neglected, maps will continue to be classified in non-standard ways, increasing barriers to establishing the purpose, accuracy, effectiveness of the quality of terminological maps. The longer the international community is without a publication in this area, the more expensive the problem will be to resolve due to the persistence of legacy metadata and the cost of modifying existing mapping processes to fit an agreed specification; therefore, a TS solution is highly desirable.

Health Informatics — Terminology resource map quality measures (MapQual)

1 Scope

This document provides quality requirements for producing a quality map between terminological systems.

This document establishes measures which can be used to assess the quality and utility of a map between terminological resources in order to determine the types and levels of measure required for common use cases in healthcare.

NOTE Examples of such cases include conformity assessment.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
auto-matching
computational mapping task, undertaken using an algorithm based upon the relationship between *concepts* (3.5)

3.2
categorial structure
reduced system of concepts to describe the organization of the semantic categories in a particular system of concepts

Note 1 to entry: A categorial structure for body structure representation could include the categories for body system (e.g. skin, digestive) and anatomical location (upper body, abdomen).

3.3
classification
exhaustive set of mutually exclusive categories to aggregate data at a pre-prescribed level of specialization for a specific purpose

3.4
code system
organized, managed collection of codes each of which has associated designations, meanings and in some cases relationships, properties or rules

Note 1 to entry: Code systems are often described as collections of uniquely identifiable concepts such as ICD-10, SNOMED CT and LOINC. Code systems are often established and maintained by authoritative sources such as standards development organisations.