Toward a Harmonized WHO Family of International Classifications Content Model

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Abstract. An overarching WHO-FIC Content Model will allow uniform modeling of classifications in the WHO Family of International Classifications (WHO-FIC) and promote their joint use. We provide an initial conceptualization of such a model.

Keywords. ICD, ICF, ICHI, Family of International Classifications

1. Introduction

The 11th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-11) represents a fundamental change in the methodology for developing new classifications at the World Health Organization (WHO). Major departures from past ICD revisions include an information model of ICD categories called the Content Model, the maintenance of all-inclusive knowledge about ICD-11 content, called the Foundation, and the ability to create specialized classifications, called linearizations, for a range of use cases.

In addition to ICD, the WHO-FIC reference classifications include the International Classification of Functioning, Disability, and Health (ICF)[1], and the emerging International Classification of Health Interventions (ICHI)[2]. The goal of this work is to develop a generalized WHO-FIC Content Model that defines the information structure of the entities in the classifications and their semantic roles.

2. Method

The Content Model defines the types of entities and relationships in the WHO-FIC Foundation. We analyzed the structure of ICD, ICF, and ICHI to determine an

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overarching conceptualization.

3. Results

We conceptualize the generalized WHO-FIC Content Model as consisting of the following: (1) *Codable entities* in a classification: These are the categories that represent phenomena that a classification is designed to encode. For ICD, diseases, disorders, and injuries are examples of codable entities. For ICHI, health interventions are the codable entities. For ICF, functioning situations (defined in terms of ICF domains and the impairment/limitation/restriction qualifiers) and environmental factor roles, will be codable entities. (2) *Structural component*: These are the entities that help to define the meaning of codable entities. For ICHI, targets, actions, and means are the structural components of health interventions. For ICF, body structure, body function, activities and participation, and environmental factors are the structural components that help to define the functioning situations and environmental factor roles that ICF is designed to code. No structural component is defined for ICD at this time. (3) *Defining qualifiers*: In ICF, some attributes, such as the extent of impairment qualifier, are necessary for the definition of codable entities. (4) *Extension codes*: These are entities that can be used to refine the codable entities. (5) *Properties of the classification entities*: These include informational properties, such as title and definition, and post-coordination properties that represent axes along which the entities can be defined logically or specialized.

In addition, a *post-coordination model* specifies how the structural components, defining qualifiers, and extension codes can be used, in conjunction with post-coordination properties, to define and refine codable entities. Finally, a *linearization model* specifies what entities and relationships are necessary to describe any linearization in the Foundation. It allows the specification of the entities that should be included in a linearization, the post-coordination axes are allowed or required in a given linearization, and constraints on the values of the post-coordination axes in a linearization.

4. Discussion

ICD and ICHI can easily be formulated in this framework. For ICF, the introduction of the concept of codable entities as composed from ICF domains and qualifiers formalizes what has been informally defined. The post-coordination model defines the semantic roles that each type of entity plays in the information model. In conclusion, the unification of WHO reference classifications in a common modeling framework is promising and provides a solid foundation for future enhancements of these classifications.

References

[1] World Health Organization, International Classification of Functioning, Disability, and Health: ICF, Geneva, 2001.
[2] World Health Organization, *International Classification of Health Interventions (Draft in Development)*, https://www.who.int/classifications/ichi/en/.