

Health information systems learn to speak ICF: Toward electronic ICF-based individual records

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Abstract The alpha version of a new web application was developed using ICF-CY and other medical terminology systems as a basis for a flexible electronic standards-based bio-psycho-social record. The web application translates information into ICF-CY EFs and releases a neutral list of EFs as first output. The functioning/disability ICF-CY based assessment is carried out by multi-professional teams, who input information to be coded, being facilitated by the web application in matching EFs to each B, S and A&P categories. The web application releases specific outputs useful to distinguish between functioning and disability in the same functioning profile and to highlight the EFs involved, to provide disability certifications, and to plan reasonable adaptations to overcome disability. The first field trial is ongoing in the Friuli Venezia Giulia Region, implementing the regional Health and Social Action Plan 2010-2012.

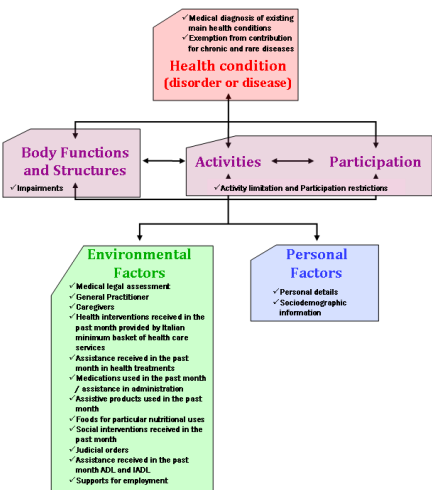
Introduction

To create interoperable Electronic Health Records (EHRs), standards are needed for: (i) clinical vocabularies; and (ii) healthcare message exchanges, in which one system exchanges messages with another EHR ontology (i.e., content and structure of the data entities in relation to each other). In addition, EHR systems must follow appropriate privacy and security standards, especially as they relate to national regulations. In order to collect valuable data on disability, Italian WHO-FIC CC was committed to develop the alpha version of a new web application named FBE/ electronic ICF-based individual record (EICFR) was developed using ICF-CY and other medical terminology systems as a basis for a flexible standards-based electronic bio-psycho-social record (1)

Methods & Materials

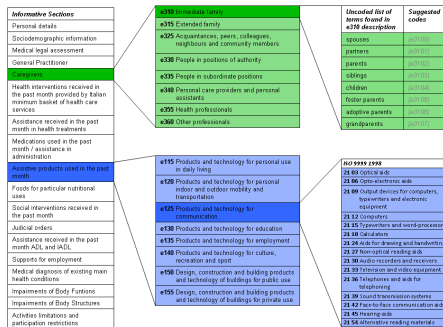
The conceptual design and implementation of a minimum dataset for individual records were developed in accordance with an ad hoc bio-psycho-social assessment protocol tested in more than 1,300 Italian outpatients in the past three years (2). The web application includes an information model and a description model. The information model contains concrete record entries summarized in Figure 1.

Figure 1. FBE Web application model considering the ICF model of Functioning and Disability



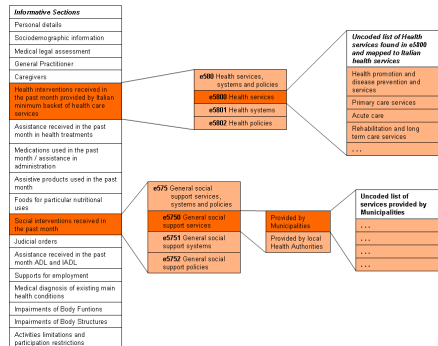
The description model provides templates for the bio-psycho-social record. The templates describe information that can be entered, all referred to the ICF conceptual model. Particular emphasis was placed on collecting information useful to describe the interaction between an individual and his/her environment. The information were automatically mapped to ICF-CY concepts, and specify how the concepts can be combined with natural language sentences and which concepts are mandatory or not (Figure 2).

Figure 2. ONE to MANY Environmental Factors mapping



Descriptive labels are provided for the ICF-CY categories of Environmental Factors (EFs), which are too broad for a precise description of the interaction between an individual and his/her surrounding environment, and for individual care planning purposes (Figure 3).

Figure 3. Examples of descriptive labels for some categories of Environmental Factors



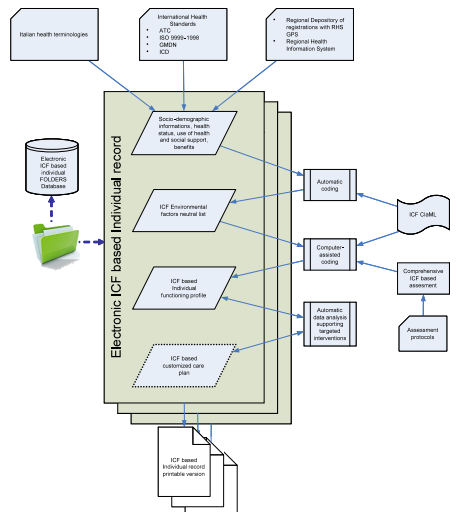
To create a suitable bio-psycho-social lexicon, information is aligned with a terminology collection containing ICF-CY, ISO9999 (1998), national nomenclatures of medical products, and social and health intervention vocabulary. A proposal of an HL7 CDA2 specification of representation of the records will be defined following the model of specification proposals for health records approved by national bodies.

Results

The EICFR is filled in different steps and by different professionals. Information on personal and environmental factors is collected using natural language (no skill in ICF language is needed) by health or social professionals at patient admission. The web application translates information into ICF-CY EFs and releases a neutral list of EFs as first output. The functioning/disability ICF-CY based assessment is carried out by multi-professional teams, who input information to be coded, being facilitated by the web application in matching EFs to each category.

The web application releases specific outputs useful to distinguish between functioning and disability in the same functioning profile and to highlight the EFs involved, to provide disability certifications, and to plan reasonable adaptations to overcome disability (Figure 4).

Figure 4. FBE Web application content model schema



Conclusions

The major value of integrated clinical systems is that they enable to capture clinical data as a part of the overall workflow. An EHR integrates data to serve different needs. The goal is to collect data once and then use it several times (3). The EICFR in Figure 4 depicts the integration of healthcare data from a participating collection of systems for a single patient encounter. By using the electronic ICF-based assessment tool box it is possible to standardize data collection for evidence-based health and social planning and care and for statistical purposes. Some proposals may be submitted to update the EF components of ICF and ICF-CY. Recommendations are given to operationalize the concepts of "disability" and "functioning" respectively as a "negative interaction" and a "positive interaction" between an individual and his/her environment.

References

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- (3) National Institutes of Health National Center for Research Resources. Electronic Health Records Overview, 2006