Interoperability Criteria for health-related classifications: the ICHI workbench

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Abstract

The development of an international classification of interventions has been an elusive challenge for decades. The evolution of health care has emphasized the need for one such classification. At the same time, applications in various areas of research, management and communication have highlighted its multifaceted nature. Piecemeal solution development has succeeded in creating a patchwork of ad hoc views that fall short of meeting the interoperability needs of increasingly automated, highly integrated information management systems, resulting in poor portability of data, recurrent costly maintenance and upgrade procedures, and excessive dependence on actors whose interests may not always coincide with genuine international public good.

Aspects of desirable solutions are reviewed and tabled for an open multidisciplinary discussion among experts. They could lead to agreeable technical specifications to be taken into account in a possible international call for tenders towards distributed implementation.

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1. Introduction

Communication on health interventions (as we call them now) has pervaded the entire health information systems scene for quite some time. It has recently become lively in relation to specific development projects, notably linked to the deployment of ICTs in the health field.

While exchange of information on patients between doctors has existed, be it "only" through the circulation of paper files, new use cases for that information have become technically imaginable. Particular applications have been developed, with increasing levels of sophistication and complexity, but also, until stabilized standards emerge, with decreasing levels of readability and portability, resulting in limited interoperability. Many areas of work were affected, beyond bed-side care: they range from hospital activity management and planning to cost monitoring and containment, from health system financing to health insurance coverage, from patient safety to public health concerns, such as epidemiological studies, improved equity, patient-citizen empowerment, and critical cross-border and cross-cultural communication in emergency situations.

Each of the subject fields has a specific standpoint in relation to the health information universe. Different perspectives may be explored using different methodologies, and reason on different subsets of data elements. Some overlap in data requirements is likely between domains, but differences are also to be expected.

Proposed solutions to classify health interventions have so far failed to meet the expectations of a large array of potential users, collectively and severally, at facility, sub-national, national or international levels. Some of the determining factors are reviewed and options towards practical solutions are explored.

2. Do we need to classify interventions at international level, or don’t we?

At the International Conference for the tenth revision of the International Classification of Diseases, it was decided that efforts towards an international classification of medical procedures should be suspended. Rapid progress in medical knowledge and even faster changes in medical technology implied that classifications of interventions would require sustained maintenance and updating efforts beyond the Member States' capacity. Experience gained with the much less volatile ICD called for caution and the allocation of available resources to priority actions.

Since then, a number of developed countries have developed their own classifications of procedures. Yet, the purpose, scope and governing principles of such classifications vary.

National vs international needs. In certain cases, medical procedures have been added to the classification of diseases in force in the form of so-called modifications, such as ICD-9-CM, ICD-10-AM. Others preferred distinct though related schemes.
Claiming to meet different requirements in different health systems, the variety of solutions soon met the needs of the originating countries, but paid only lip service to international comparison needs.

As international cooperation intensified, and in the absence of a common standard, bilateral efforts were made to implement ad hoc solutions, resulting in larger communities of practices, with common references, using similar methodologies, calling on the same battery of tools... but still producing only marginally comparable data sets.

In an attempt to bridge the gaps, the international community has continued to advocate a multilateral approach, with a so-called XM, i.e. one that could materialize as common backbone of commonly agreed categories defined on the basis of commonly agreed principles. Commonly agreed business rules would then allow the mapping of particular national implementations to the backbone mediating technical interoperability. This is still under discussions, but many practical questions regarding the overall feasibility still need to be answered.

Different perspectives. The existing lists of medical procedures feature mainly surgical interventions performed at health care facilities. Most of them are therapeutic. Imaging techniques have been recently added but diagnostic procedures tend to be left out.

Medicine or health. With the systemic approach to health systems, new roles emerge that would also benefit from coding schemes. Hospitals and other health care facilities are no longer the only subject of investigations and monitoring. For particular purposes or for use in particular environments, new procedures need to be added for monitoring and evaluating health care delivery outside hospitals. In the primary care context, many measures are taken with great positive impact on the health of entire population. Some are truly medical in nature, but others are more preventive. Medical procedures became health interventions, but the change in language was not followed by a change in attitude.

Integration or co-operability. As an example, ICHI, which has recently been proposed as a candidate member of the Family of International Classifications, has been criticized for its insufficient coverage of such non-surgical interventions. Conversely, the general organizing principle of the medical procedures doesn't allow for the adequate representation of hundreds of interventions properly assessed for cost-effectiveness by WHO using standardized open-source protocols. Those interventions would deserve close monitoring at international level, as they can use up sizeable portions of the countries resources. The justification for monitoring medical procedures when it comes to monitoring hospital costs cannot be denied to other countries for other interventions. Yet, do both sets of procedures have to be in the same classification? In other words, do they need to be integrated or should they be designed in such a way that they would co-operate?

Patient or system. Another illustrative case of domain asymmetry is that of patient safety. Efforts are under way by the international community to analyze formally the
domain of patient safety event reporting and classification. The conceptual framework that has emerged points at intrinsic and contextual aspects of interventions which are very relevant to patient safety and should best be collected in the operating room and at the bed side. Is it an acceptable overhead cost? Can it be reasonably assumed that all data elements for all possible uses in health information systems will be systematically collected for all patients? This has been denied in some quarters, recalling that the primary purpose of medical practice is to safeguard the health of patients, and only marginally after that to improve system performance.

**Size is not all.** Progress in technology has caused many to be carried away by a data collection frenzy. Larger collections of items, however, with finer granularity, accommodating more numerous analytical axes, may not prove to produce better or more useful information. Consistency in the descriptive and relational analysis of the content, based on an agreed ontological vision of the world and an agreed set of rules and principles to represent it, are preconditions for developing acceptable co-operability platforms.

### 3. Logically, questions arise

A number of issues need to be addressed.

If the revision of the International Classifications of procedures in medicine was postponed due to the rapid change in practice and the excessive cost it would entail for its subsequent maintenance, why do many countries prefer to carry alone the cost of developing individual products.

Considering only industrialized countries, with very comparable levels of quality of care, how can it be justified to maintain and to keep developing different intervention lists?

Don't health systems in other parts of the world need to be managed as well? Is it not crucial for all countries to manage health care in general? Are problems less acute in other countries as compared to those who feel the need and can afford to have a solution?

If the reason for having classifications of interventions is cost monitoring, doesn't it make sense to cover preventive and other public health interventions as well? They can be very costly on a national scale, yet have an enormous impact in alleviating the burden of disease in countries.

If the justification given for developing national versions is the specificity of the national health systems, how can it be justified to market such classifications in very different countries with different histories and medical traditions?

More fundamentally, given the variety of purposes in monitoring interventions of a very diverse nature, and the elusive implementation of a single international classification of interventions, shouldn't the issue of the feasibility of such a classification be entirely revisited? Shouldn't the intrinsic difficulties be analyzed...
and explicitly formulated?

Is the international community adequately equipped to address the issue? Are tools and mechanisms available that are robust enough to produce reliable outputs? Are there areas that need further investigation and research? Can existing projects and programs elsewhere be called upon?

Should or can a typology of genuine needs and corresponding system requirements be established to guide international action? Are standards available that would, in this area as in others, guarantee evolutionary stability of the products developed on their basis?

Do we clearly understand reasons for the limited international cooperation on this subject?

4. What should/could be done about it?

Does it mean that an international classification of interventions is impossible, or even not desirable?

Not necessarily. But the case should be reviewed on its own merits.

1. Currently, the need to have an ICHI is not uniformly perceived among stakeholders. In Member States, the situation regarding the adoption, or a fortiori the development, of a classification of interventions is variable. The usefulness of such a classification for national health systems seems well established and materialized in richer countries. It is recognized in a number of other countries, but implementation is often postponed or hampered by insufficient resources for deployment and support. The merits that could be derived from an international version are often evoked in general terms, but the real benefit for international health does not seem to have been sufficiently convincing to result in firm political commitment and adequate allocation of resources.

  ➢ The real merits of an international classification of interventions (as opposed to a collection of national classifications with their respective outside adopters) should be supported by stronger scientific evidence, regardless of the final form that would have to be further clarified.

  ➢ Scientists and senior public health officials should raise awareness among decision makers in their respective countries\(^1\) and place it on their agenda.

2. The relative risk of uncoordinated bilateral cooperation developments may result in incompatible data sets produced in different groups of countries. If the merits of a global cooperation in health are recognized, the absence of

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\(^1\) It should be remembered in this respect that WHO currently has no specific mandate to address this issue. The generality of the constitutional mandate is insufficient as such to determine decisive action.
a truly international offer might result in an inequitable offer to WHO Member States.

- The implications of the persistence of the current situation must be fully evaluated.

3. Investigatory efforts have focused on existing end products, such as ICD-9-CM, ICD-10-AM, CCAM, OPCS, NOMESCO, and their planned updates, adaptations, and replacement products.

- There might be a need to further analyze and better understand the rationale for such developments: national priorities, economic drivers, public and private interests, political interests and other synergies and alliances must be investigated.

4. Knowledge management techniques have gained recognition in many domains. Plans are being made to revise the ICD taking advantage of advanced knowledge management techniques and ontology-based representation techniques. Efforts so far to develop an international classification of interventions seem to have adopted a fairly conservative stance.

- Methods used in the past to develop health-related classifications might now be in part obsolete, and any potential international project on classification of interventions could benefit from a thorough audit of the various classification development approaches.

5. The structural implications of the multiplicity of use cases appear to be extremely serious in a relatively volatile domain. The shift in emphasis from surgical procedures to a much broader scene is still recent and may not have been fully appreciated among all stakeholders. Questions such as a unique, all-inclusive classification, versus a backbone approach with plug-in modules, and their respective feasibility, need to be answered clearly to lay down the technical and operational specifications of the final product.

- Knowledge engineering techniques must be investigated thoroughly. To that end, specific resources such as the International Terminology Network in preparation under the aegis of WHO, could prove invaluable in providing a robust theoretical base.

6. Some areas may have been underestimated and under-investigated. This is not surprising at all in a very dynamic area where concerns for service delivery and cost-effectiveness are crucial. In spite of all the past investments, why are concrete results so few? Large scale research road-mapping projects are under way, with the direct involvement of WHO, to identify missing elements in the research agenda that could ensure short term results.

- Several centers that are part of the WHOFIC network or the planned International Terminology network are actively involved. Networking
efforts by the WHOFIC network, for instance through the Terminology Reference Group, the technical specifications applicable to the possible future classification of interventions are swiftly investigated and shared with the Network.

5. Conclusion

The present situation related to classifications of health interventions is highly unsatisfactory. In spite of all the frustrations, the WHOFIC network is invited to review the lessons learned and redefine a common development perspective. On the WHO side, efforts will be pursued to collate requests from Member States for cooperation in this area. Detailed analytical work will be encouraged among all advisory partners, within the limits authorized and in line with the decisions of the Governing Bodies.