

Classification of External Causes of Injuries (ICECI) - an international task force under the auspices of the WHO

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1 Introduction

At the Fourth World Conference on Injury Prevention and Control (Amsterdam May 17-20, 1998) the WHO Working Group on Injury Surveillance Methodology Development presented the draft International Classification for External Causes of Injuries (ICECI). This classification is the result of at least two decades of exchange and debate on the need for improving the tools for injury data representation which is traditionally based on the International Classification of Diseases (ICD-chapter XIX and XX).

In this paper, the 'raison d'être' of a separate classification is presented as well as its scope and basic structure.

2 The needs for re-engineering current classifications for 'external causes'

2.1 Epidemiology as basis for prevention

Injuries are a most serious health problem in all nations of the world (Murray & Lopez, 1996). Today, we know to prevent a substantial proportion of the diseases that kill or disable, but our knowledge still appears to be insufficient to ensure effective injury control. As a result injuries rank among the leading causes of death and account for ten to twenty percent of all hospital admissions. Injuries are also a costly health problem, in particular due to the fact that children and young adults are at risk which results in long periods of handicapped life or loss of productive life due to premature death.

Any effort to reduce injuries should begin with examining the number and nature of injuries as well as the main determinants, i.e. the causal chain of events leading to the injury event. The realization that injury can be understood with the same tools we have directed against disease is recent. For much of this century injury prevention efforts focused on the assumed shortcomings of the victims and therefore directed much of their energy educational measures as the dissemination of pamphlets and posters. The modern view of injuries does not eliminate personal responsibility but assigns also weight to other factors such as structural environment, life styles and the technical properties of equipment involved in the injury event: injury prevention through *engineering* safer working and living conditions, through *enforcing* rules and regulations for safer practice and through *educating* continuously parents, youngsters and adults (the three E's).

2.2 Shortcomings in current data

Injury mortality data is the easiest to obtain because death records data are maintained in many nations. In a number of countries also hospital discharge statistics are available at national level, however they include much less detail as regards the causes of injuries and the relevant circumstances. The World Health Organization's International Classification of Diseases (ICD) has served for many decades as the main classification for these information systems in particular those implemented in the health sector (such as coroner reporting systems and hospital discharge statistics). But this classification was first developed a century ago, when modern concepts of injury control were still many decades in the future. In the 1980's a broad criticism with respect to the insufficiencies of the ICD commenced to rise, underlining the shortcoming of the nature of injury coding (that combines injuries for instance that are extremely diverse in their severity) and the lack of logic and flexibility in the external coding (E-codes) system.

The ICD is limited in its use for injury prevention due to:

- its being predominantly developed for mortality statistics and therefore not sufficiently discriminating in morbidity data;
- single dimensional in structure where the relevant information is in essence multi-dimensional;
- complex and inconsistent in structure and therefore poor in user-friendliness and certainly not flexible for application in less resourced settings of health care services; and
- insufficient in covering relevant aspects in more specific areas of interest such as injuries due to violence and work-related injuries.

Since the eighties, the need for establishing a logic and simple "modular system" was strongly voiced. Such a system should separate clearly the various aspects involved (i.e. the independent variables), such as the ethnologic agent, event-characteristics, the environmental features or products involved and the intention (purposely inflicted injury or not). In the 80's and 90's some progress has been made in that respect, in particular owing to initiatives from various parts of the world, such as:

- in the Scandinavian region by its Nordic Medico-Statistical Committee (Nomesco, third version published as 1997);
- in the United States of America and the U.S.-Centers for Disease Control;
- in Australia by issuing a National Data Standard for Injury Surveillance and in New Zealand through designing a Minimum Data Set; and
- in the Western European Region by the implementation of a European Home and Leisure Accident Surveillance System (EHLASS) since the early 80's (Rogmans & Mulder, 1998).

From these groups input has been given to the ongoing process of ICD-revision in the second half of the 80's, which as led to significant improvements in the final version of the tenth Revision of the ICD that is now in progress of being implemented in WHO-Member States. Yet the fundamental criticism on the E-coding system and its shortcoming in unfolding the logical dimensions, remains the same for the tenth revision.

This was the very reason for the WHO and its programme for Safety Promotion and Injury Control (SPIC), to help to create synergy between the various initiatives already taken in the different parts of the world and to establish a separate Classification of Injuries. This classification should meet the requirements of injury control practitioners and fit in the family of WHO-classifications for diseases and "health-related problems". This task has been taken up by a "WHO-Working Group on Injury Surveillance Methodology Development" (see annex) under guidance of the Violence and Injury Prevention-programme manager at WHO in Geneva.

3 Aims and scope of ICECI-classification

The ICECI-classification and its guidelines aim to ensure a high degree of uniformity in the methodology, structure and data content of injury surveillance systems that operate where injured people are treated. The guidelines and its classification serve as a general instrument for the health sector's routine registration of the aetiology of all types of injury, complementing to the already existing system of ICD and its section on external causes. The injury classification is, in essence, compatible with and collapsible to the relevant ICD-sections.

The purpose of the classification is to assist researchers and prevention practitioners in (WHO, 1998):

- defining more precisely the domain of injuries they are studying;
- answering questions such as where did the injury occur, how, under what circumstances and which products were involved?; and
- in providing a more detailed description of specific categories of injuries such as traffic related injuries and injuries due to violence.

In developing the classification due consideration is given to include at least the basic factors that are relevant for primary, secondary and tertiary injury prevention. In first instance, we focussed on basic data that is helpful for primary prevention, i.e., relevant information on "where and how did the injury occur" and not on secondary or tertiary prevention. However, it is our ambition to expand the guidelines and classifications in due course with data elements that are relevant for injury control and rehabilitation: injury typology and severity measurement, the role of protective equipment, first aid and emergency care, measurement of long term consequences and so on.

4 Structure of the classification

In developing the ICECI four basic conditions had to be fulfilled rigorously. It should ensure:

- a. compatibility with ICD-10 and its chapter XX on injuries, poisonings and other external causes,
- b. optimal relevance for injury prevention research and should therefore focus on the primary factors that influence injury risks and injury events,
- c. world-wide relevance with respect to data items and categories included in the system, and
- d. ensure also broad applicability of the classification at different levels of sophistication in research-implementation and facilitate in particular data capture in health settings in general and Emergency Departments in particular.

These requirements can only be met by developing a system that is flexible in adapting to the needs and demands in different settings and in different regions of the world while maintaining the basic principles of a logic structure: a system with an open and transparent structure.

4.1 Structure

For developing ICECI three steps have been taken:

1. Unravelling the fuzzy one-dimensional structure of ICD-external cause into the three essential dimensions that the ICD-designers collapsed into one: 'intent', 'mechanism', and 'objects involved in the injury event'.
2. Add additional codes to these three data items as well as to the activity and place item;
3. Develop additional sets of items that are specifically relevant for one or two subsets of cases such as traffic-related injuries or injuries due to violence.

For compatibility with ICD-10 codes for external cause, the following items provide the key: intent, mechanism, objects/substances, place, activity, transport mode and transport counterpart.

Figure 1 also demarcates the boundaries of both ICD and ICECI. ICECI adds to ICD a set of additional codes for the traditional variables as well as a limited set of additional modules. Both additional sets of codes and modules can be separated from ICECI and partially as well as fully applied as a complement to an already running ICD-based surveillance system without interfering in the integrity of the existing ICD-system.

4.2 Relation to ICD-10

Within the ICD-structure it is acknowledged that for some specialities, such as in oncology and in dentistry, it does not include enough detail and that information may be needed on different attributes of the classified condition than those included in ICD. The main ICD cannot incorporate all this additional information without losing its relevance and accessibility for the traditional users. Therefore the concept of 'family of disease and health related classifications' arose, allowing expansion of the mandatory three-digit and recommended four-digit character code. The ICECI, although not yet formally adopted as such, is an example of such a complementary classification that allow the allocation of diagnosis using different axes of classification in addition to ICD.

ICD-compatibility of any health services based injury classification will always remain essential as:

1. In the health sector the ICD provides the common nomenclature both to health professionals and to administrators in their professional and scientific work. It is the common language to which any supplementary information system should link as much as possible.
2. Most information related to deaths and increasingly also related to in-patients is classified in accordance with ICD. For comparing information from different sources, such as death certificates, hospital discharge statistics and ED-records, it is important that all data fit to the common core classification of ICD.
3. As important health indicators (such as DALY's), cost estimates (DRG's) and impairment assessment (ICDH) are based on ICD-structure, full linkage between ICECI and ICD is also important.
4. Most of the current regionally developed injury classifications took ICD as a reference frame, but made their own exegesis resulting in quite divergent structures. Any harmonisation should therefore start with 'the mother of classifications'.

In the current draft ICD-compatibility has been given prime, but not sole, priority. Compatibility was given an operational definition as follows: data collected according to ICECI should be able to be reported according to ICD-10 Chapter XX at three character level or better.

In practice , this goal can be approached by a multi-axial system meeting the other design criteria, but it appears to be impractical to meet it completely.

Various levels of compatibility can be achieved and this involves trade-offs against other characteristics of the classification. For example, the proportion of three character ICD-10 Chapter XX categories that can be mapped from ICECI to ICD can be increased at the cost of adding complex, rarely needed, or poorly ICD-defined categories to ICECI. Empirical testing is required to reveal the losses and gains in this process.

4.3 Guide for use

This section is not yet completed but certainly will contain a short guide to using the ICECI in different settings and environments. It is expected to include also suggested case definitions and inclusion criteria, an overview of technical and administrative issues and pointers to sources of further information.

5 Further development and maintenance

It is evident that ICECI is far from complete: additional modules still need to be developed for work-related injuries and sport injuries, and some of the data items, such as activity and place, need further redesigning. Also the violence module needs further development and specificity in accordance with the research needs on the one hand and the practical limitations on the other hand.

It is also intended to develop additional data items that can cover important information elements related to issues as: socio-economic status (indicator), alcohol and drug use and other precipitating factors.

The current version of the ICECI is deliberately intended for a much broader consultation among the injury prevention and research community. The Working Group will actively seek comments and suggestions from the various safety sectors involved (traffic/ work/ consumers/ violence prevention) and from the health sector. The main purpose of the field testing is to ensure the guidelines' utility and the classification's comprehensiveness and global applicability. It will include the following components:

- checking compatibility with ICD in situ;
- testing the hierarchy and the codes for mutual exclusivity and adequacy for purpose (including the completeness of instructions and clarifications);
- checking the utility and acceptability of operational definitions with relevant international agencies and sectoral interests (traffic, work, consumer products, violence control and so on); and
- identifying the size of the efforts and costs to be invested in collecting routine information in accordance with the protocol and in a variety of settings.

Testing in the field will be part of a process of screening and testing. This will include the following components:

- review of the content of the classification through screening its structure and testing it on paper;
- operational testing of the classification in different settings on a limited number of cases and looking into the process of data collection and coding, the specificity of the classification and in reliability and validity issues.

This will be done in the course of 1999 allowing the Working Group to revise the ICECI into a version 1.0 for publication in 2000.

After this process of testing and revision, ICECI's implementation in practice will be continuously monitored by the Working Group. Regular updates will appear and new and interactive media will be used for that purpose.

The Working Group will also initiate the development of additional data items and support tools. Beyond that it will launch a programme of activities that aims at enhancing expertise and professional quality in injury epidemiology and injury surveillance in the various regions.

- For further information: Secretariat at the Consumer Safety Institute, WHO-Collaborating Center for Injury Prevention & Safety Promotion (director dr. Wim Rogmans), P.O. Box 75169, 1070 AD Amsterdam, The Netherlands. Request for a copy of the draft classification are welcome at this address or at fax number: + 31 20 6692831/e-mail: S.Mulder@consafe.nl

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