The need for a Classification System of External Causes of Injuries

Dr. Claude Romer (World Health Organization) and Dr. Wim Rogmans (Consumer Safety Institute - WHO-Collaborating Center on Injury Surveillance)

Introduction

Injuries are a most serious health problem in all nations of the world. 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 reproductive 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 caused chain of events leading to the injury event. Therefore, routine scrutiny of the occurrence of injury is an essential component of effective public health injury control. The main purposes of injury surveillance are to:

1 describe injury levels and patterns to provide a basis for broad policy development and to inform communities on their injury experience;
2 identify and describe specific categories of injury and risk factors which are to be subject of control efforts (i.e. priority-setting and target setting);
3 describe and characterise groups of injury cases epidemiologically to generate hypotheses for causal research; and to
4 monitor progress towards these goals and the impact of intervention programmes and identify new emerging hazards timely.

In addition, injury surveillance may facilitate the monitoring of some basic aspects of trauma care and rehabilitation service management.

Only limited information can be obtained through the existing data sources such as coroners records and hospital discharge information systems. Although the virtue of these systems is that they are already in place, they lack precision in information for injury prevention since they are established for other purposes, i.e. population statistics and hospital management.

The World Health Organisation'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 main shortcoming of the E-coding system is that it folds several concepts and dimensions into a single classification (one dimensional). Since that time, 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. independent variables), such as the ethologic agent, event-characteristics, the environmental features or products involved and the intentionality (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);
- in the United States of America and the US-Centres for Disease Control;
- in Australia and New Zealand through the development of Injury Surveillance Information Systems and the designing of 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.

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 the guidance of the SPIC-programme manager at WHO in Geneva.

The structure of ICD-classification

The purpose of the ICD is to permit the systematic recording, analysis, interpretation and comparison of mortality and morbidity data collected in different countries or areas and at different times.
Although the ICD is suitable for many different applications, it does not always allow the inclusion of sufficient detail for some specialities, and sometimes information on different attributes of the classified conditions may be needed.

The main ICD (the three- and four-character classification), covered by the three volumes of ICD-10, can not incorporate all this additional information and remain accessible and relevant to its traditional users. So the idea arose of the "family" of disease and health-related classifications, including volumes published separately from the main ICD, to be used as required (figure 1).

The "core" classification of ICD-10 is the three character code, which is the mandatory level of coding for international reporting to the WHO mortality database and for general international comparisons. The four-character subcategories, while not mandatory for reporting at the international level, are recommended for many purposes and form an integral part of the ICD, as do the special tabulation lists.

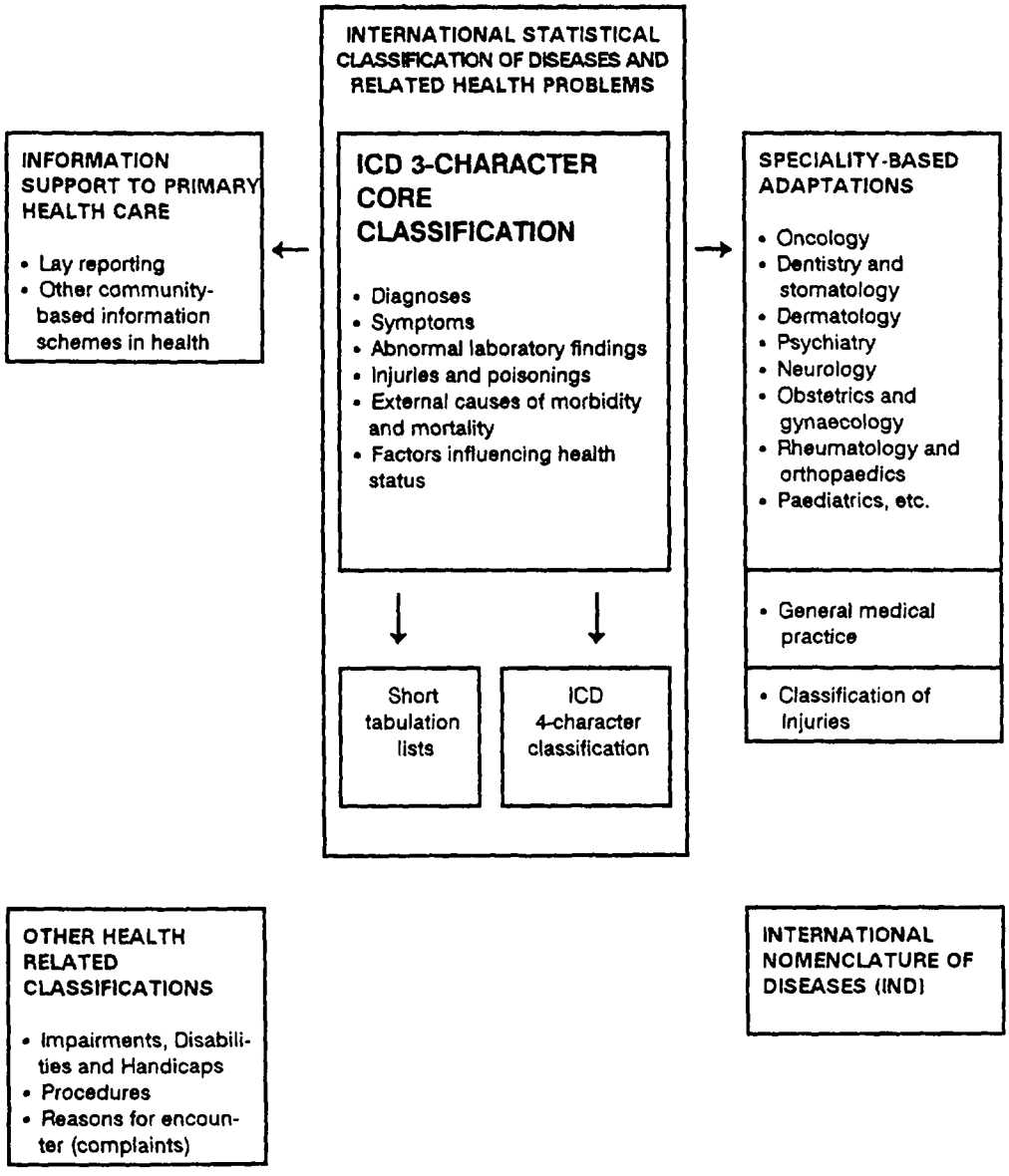
There are two main types of classification. Those in the first group cover data related to diagnoses and health status, and are derived directly from the ICD by either condensation or expansion of the tabular list. The expanded lists are used to obtain increased clinical detail as in the speciality-based adaptations. This group also includes classifications complementary to the tabular list, that allow the allocation of diagnoses using a different axis of classification, such as the Classification of External Causes of Injuries which is in progress of development now.

The second group of classifications covers aspects related to health problems generally outside the formal diagnoses of current conditions, as well as other classifications related to health care. This group includes classifications of disablement, of medical and surgical procedures, and of reasons

for contact with health care providers.

The ICD family also covers a conceptual framework of definitions, standards, and methods that, although they are not classifications in themselves, have been closely linked to the ICD for a long time. One of these concepts is the development of methods to support the local collection and use of information for primary health care.

Figure 1 Family of disease and health-related classifications



Purpose of classification and its applicability

The intent of the new classification is to provide a general instrument for the health sector's routine registration of all types of injuries (transport, occupational, home and leisure, violence and self-harm).

This injury classification has been developed in close collaboration with the sectors inside and outside the health care system, including those responsible for planning and implementation of injury prevention in the respective sectors (consumers agencies, traffic authorities, labour inspections, product safety committees etc).
These sectors' need for injury data to accomplish their assignments has been fully taken into account in selecting the main variables as well as by including the minimum amount of items for each variable.
Furthermore the classification should act as an instrument for management and planning of health services' resources for those injured.

Since it is neither realistic nor expedient that all sectors of the health services are making detailed recordings, the intention was to construct the classification in such a way that it can be used on various levels of detail. The lowest level (the basic data set) has been designed so as to enable staff to have a basic recording of injuries with only a modest investment in human resources and data processing facilities.

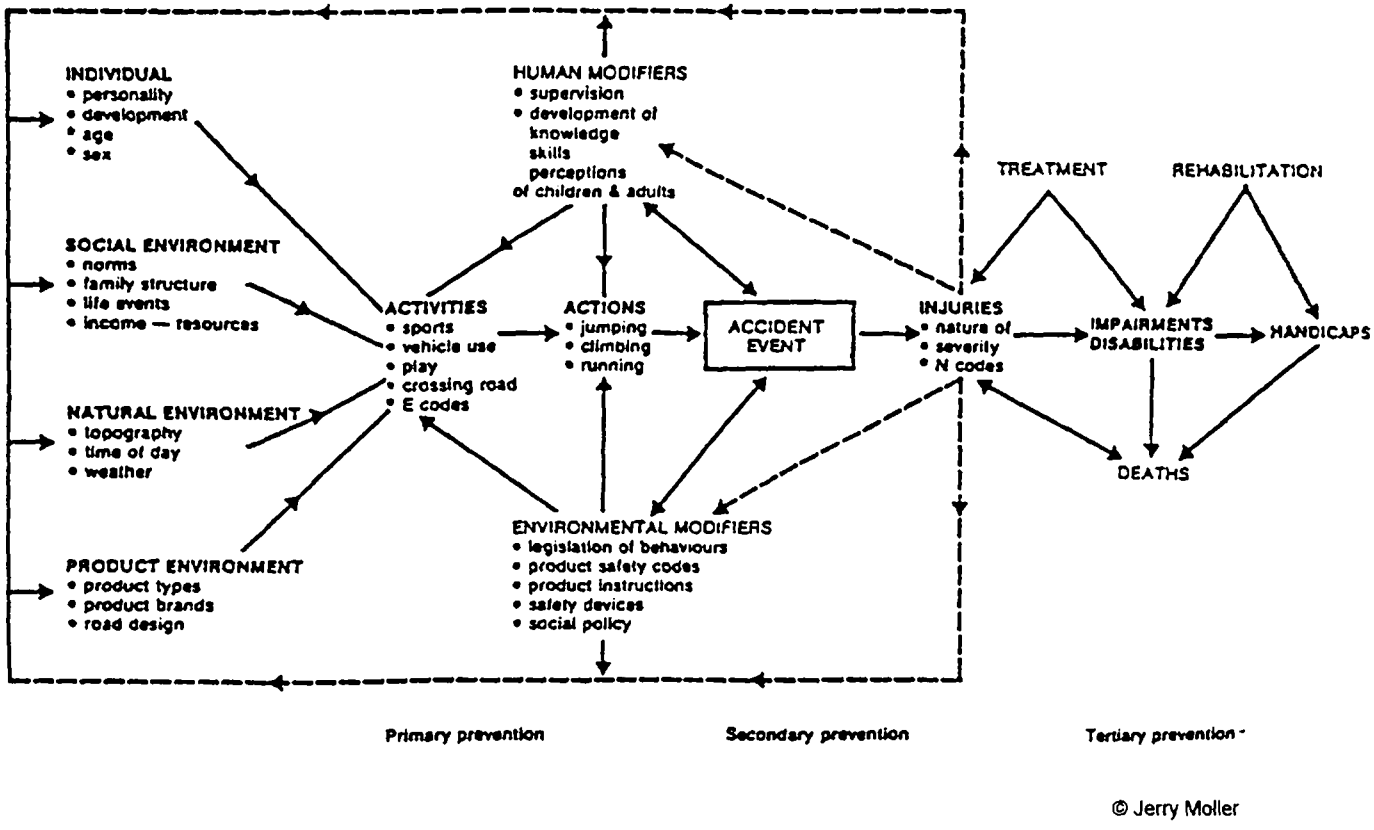
The purpose of the classification is to separate contacts due to injuries from contacts due to diseases and to answer the following questions:
- where did the injury occur
- how did the injury occur
- what was the activity at the moment of the injury
- which products were involved in the event
- give a more detailed description of transport accidents including road traffic accidents, work-related accidents, sports accidents, and events characterised by intentional injuries (violence and self-harm).

Relevant characteristics of the injury-phenomenon

Over the years many attempts have been made to describe the injury phenomenon, and to identify the major causal factors leading to injuries. Although these descriptive models have severe limitations, as they are supposed to cover such a diverse and heterogeneous phenomenon as accidental and intentional injuries, the basic structure that underlies most of these models is very helpful in conceptualising the injury process and its relevant characteristics. In figure 2 such a descriptive model is presented.

In the Accident/Injury Process-model a myriad of relevant factors involved in the process are put in two perspectives:
- a time sequence perspective (along the horizontal dimension), i.e. factors being involved in the onset of the process by contributing to the building-up of a hazardous situation (for instance a risktaking life style) or factors later involved in the process by triggering the event (for instance the break down of a vital piece of equipment someone is working with) or by aggravating the outcome of the event (for instance the absence of protective equipment or lack of first aid and adequate follow up care);

Figure 2 The Accident/Injury Process



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- a categorical perspective (along the vertical dimension), i.e. by making distinction between on the one hand social and behavioural factors such as personal characteristics and socio-economic aspects, and on the other hand physical and environmental characteristics such as road condition, housing condition and products/vehicles involved in the injury process.

The first, time sequence, perspective is clearly related to the classic distinction between primary, secondary and tertiary prevention. In injury-prevention these concepts are commonly understood as:

- primary prevention, being related to the factors that are present before the actual injury event occur or that trigger the injury event; so they may prevent the injury event occurring;
- secondary prevention, being related to factors that respond to the immediate injury event and may contribute to lessen the consequences of the injury event; and
- tertiary prevention, being related to all factors that may help to restore the damage and loss after its occurring by providing appropriate emergency care and rehabilitation, which of course may help to prevent future injury risks as is evident for instance in the case of sport injuries.

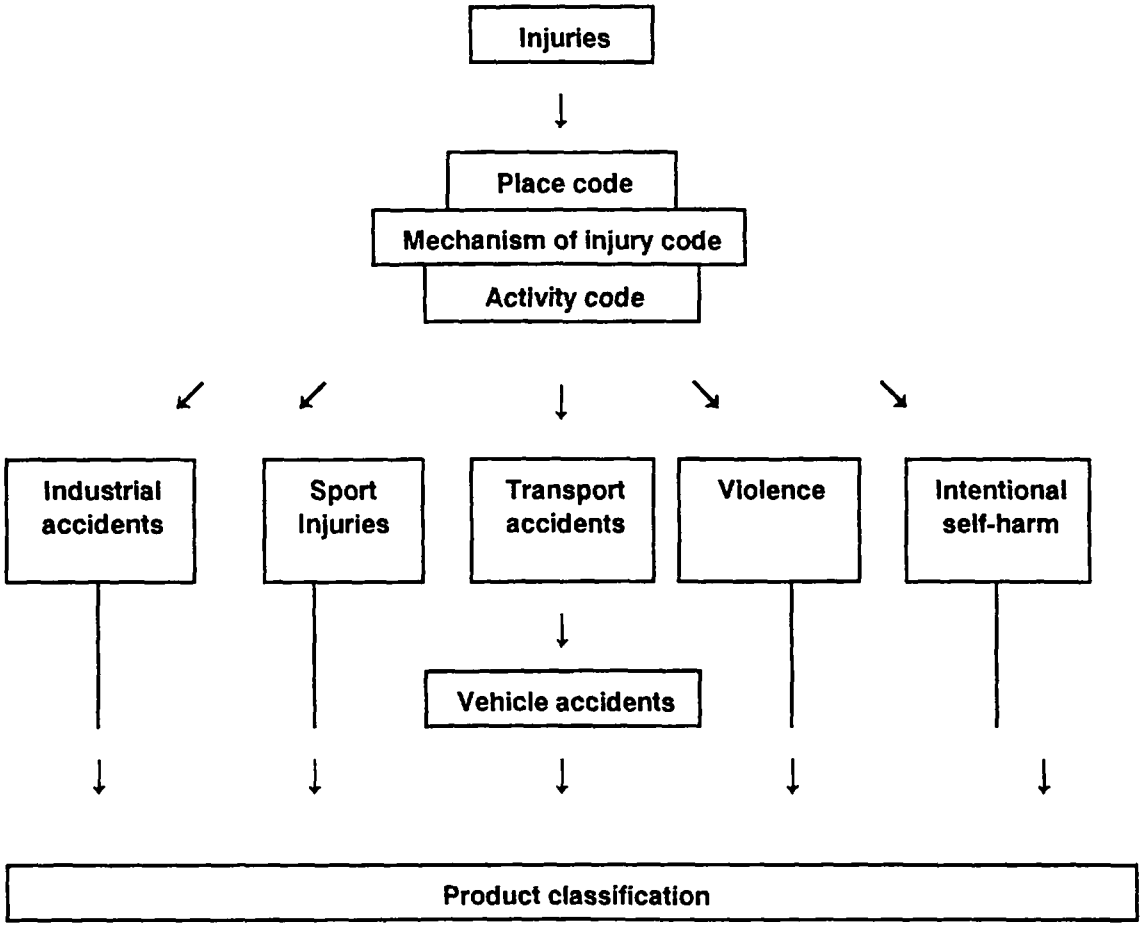
Although these two perspectives may seem theoretical at first sight, they provide an important framework for assessing the completeness of a surveillance and classification system's coverage of factors. It is also a helpful tool in assessing the relevance of information gathered in view of injury prevention. As regards the latter aspect, it is evident that a lot of systems are still focusing on injury outcome characteristics such as the nature and severity of the injury, which is not so relevant for primary and secondary prevention. In developing the WHO-Classification of Injuries, due consideration is given to include at least the basic factors that are relevant for primary, secondary and tertiary prevention.

The structure of the Classification

The classification is to be used in connection with the reason for contact code that sorts out contacts owing to disease from contacts to the health services due to accidents, violence and suicide attempts.

The Injury Classification is constructed with a basic part, following by supplementary classifications for transport accidents, vehicle accidents, occupational accidents, sports accidents, intentional injuries, and products involved in events leading to injuries (figure 3).
The basic classification is built up in axes that one by one describe place of occurrence, mechanism of injury and activity of victim at the time of injury. The individual axes are hierarchical with specifications at the 1st level at a 2nd level.

Figure 3 Structure of the Classification of External Causes of Injuries



Annex

Working Group

From its very beginning the Working group consisted of experts from the European Region, Australia/New Zealand and the USA, and of representatives from WHO/PAHO. To date the Working group counts the following members:

- Dr. Wim Rogmans* (chair) & Saakje Mulder*, Consumer Safety Institute, Amsterdam
- Dr. Claude Romer, World Health Organisation, Geneva (co-chair)
- Dr. James Harrison, National Injury Surveillance Unit, Adelaide
- Henning Bay Nielsen* & Birthe Frimodt-Møller*, National Health Council, Copenhagen
- Lois A. Fingerhut, National Center Health Statistics, Washington DC
- Dr. Richard Waxweiler, Center for Injury Epidemiology and Control, Atlanta
- Dr. John Langley, Injury Prevention Research Unit, Dunedin (NZ)
- Dr. Leif Svanström, Karolinska Institute, Stockholm
- Dr. Anne Tursz, International Children's Center, Paris
- Dr. Yvette Holder, PAHO/WHO Caribbean Epidemiology Center, Trinidad
- Mr. André L'Hours, World Health Organisation, Geneva
- Dr. H. Adbul Radjak, Ministry of Health, Indonesia

Four members of the Working group (indicated by an asterix) will act as a core group, working out technical drafts that are to be discussed in the plenary working group sessions before further dissemination among the reference group.

A reference group will consist of experts that contributed to previous discussions in the framework of ICD and experts that expressed a strong interest in Injury Statistics and their improvement (among which participants of the ICE-seminar and the Stockholm-Surveillance-meeting).

The secretariat of the project is at the chairman's office: Consumer Safety Institute, Amsterdam