. Cryer C, Fingerhut LA, Segui-Gomez M. ICE Injury Indicators Working Group. Injury Mortality Indicators: Recommendations from the International Collaborative Effort on Injury Statistics. *Inj Prev* 2011; 17;4: 281-284 PMID 21676959

Injury mortality indicators: recommendations from the International Collaborative Effort on Injury Statistics

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Accepted 16 April 2011

ABSTRACT

Background The International Collaborative Effort (ICE) on Injury Statistics called for an effort 'to reach consensus on what are the 10 most important indicators of injury incidence that offer the potential for international comparisons and for regional or global monitoring.'

Objectives To describe the process of developing the ICE indicators and to present the specifications of selected injury mortality indicators, along with comparisons between selected countries for those specified indicators.

Methods Participants on the ICE list had been asked to send to one of the authors what they considered the most important five indicators of injury incidence. These were synthesised and presented under six themes: mortality indicators (general); mortality indicators (motor vehicle); mortality indicators (other); hospital data-based (overall); hospital data-based (traumatic brain injury (TBI)); long-term disability (overall). Following two work group discussions and after drafting and revising indicator specifications, agreement was reached on mortality indicators and specifications. Specifications for those mortality indicators are presented. Morbidity indicators are still to be agreed.

Results The mortality indicators proposed were age-adjusted rates of injury death; motor vehicle traffic crash-related death; self-harm/suicide; assault/homicide; and TBI death. The empirical work highlighted difficulties in identifying TBI in countries where mortality data do not capture multiple injuries, prompting us to drop the mortality indicator related to TBI and moving us instead to introduce an indicator to monitor the use of undetermined intent in the classification of injury mortality.

Conclusion The ICE has reached a consensus on what injury mortality indicators should be used for comparison between countries. Specifications for each of these have been applied successfully to the mortality data of seven countries.

BACKGROUND

Coinciding with the preparation for the 9th World Conference on Injury Prevention and Safety Promotion held in Merida, Mexico in 2008, the International Collaborative Effort (ICE) on Injury Statistics[1] called for an effort 'to reach consensus on what are the 10 most important indicators of injury incidence that offer the potential for international comparisons as well as for regional or global monitoring.' The ICE on Injury Statistics, established in 1994 and sponsored by the US National Center for Health Statistics, provides a forum for international experts in injury prevention and epidemiology to discuss issues related to data. For more information on projects and participation visit http://www.cdc.gov/nchs/injury/advice.htm.

An injury indicator is defined as a summary measure that denotes or reflects, directly or indirectly, variations and trends in injuries or injury-related or injury control-related phenomena.[2]

This paper briefly describes the process of developing the ICE indicators and presents the specifications of selected injury mortality indicators, along with comparisons between selected countries for those specified indicators. The purpose of the paper is not to address methodological issues related to the comparison of rates (eg, standardisation) or classification issues, but rather to present consensus on injury mortality indicators. Neither does it expand on the benefits of comparing injury rates for research and intervention prioritisation.

METHODS

Consensus work

In 2008 members of the ICE on Injury Statistics were interviewed via email to elicit their suggestions regarding the five most important indicators on injury incidence. A summary of the process followed to distil those suggestions into the indicators presented in this paper is described at the ICE' website. Briefly, 57 'candidate' indicators were discussed at a group meeting (http://www.cdc.gov/nchs/injury/ice/mexico2008/mexico2008_agenda.htm) and clustered into one of the following rubrics: (1) mortality (general); (2) mortality (motor vehicle); (3) mortality (other); (4) hospital (overall); (5) hospital (traumatic brain injury (TBI)); and (6) long-term disability (overall). Subsequent work focused on the mortality indicators which were the focus of discussion of another ICE meeting where indicator specifications were developed (http://www.cdc.gov/nchs/injury/ice/washington2008/wdc_2008_participants.htm). This paper focuses on these mortality indicators.

Empirical work

Mortality data from WHO were made available to us for analysis by the Global Burden of Disease Project, particularly the Harvard University Initiative for Global Health at the Harvard School of Public Health (http://www.who.int/whosis/mort/download/en/index.html). These deaths are registered in national vital registration systems, with underlying cause of death as coded by the relevant national authority. These data are official national statistics as they have been transmitted to the WHO by the competent authorities of the countries concerned. Detailed injury death data are country-specific, ICD-10 coded and aggregated by 5-year age groups. Data were aggregated by the Global Burden of Disease into the format of the

suicide rate; (4) assault/homicide rate; and (5) undetermined intent mortality rate.

In this work we compared trends in these fully specified five mortality indicators between seven selected countries for illustrative purposes rather than for comparisons between these specific countries. It was clear, however, from these example countries that there was much variation in rates between countries. The wide variation in undetermined intent cannot be ignored. Despite WHO coding guidelines for assigning undetermined intent, there is country-specific use of the codes, sometimes for cultural reasons and sometimes for death certification reasons. This needs to be carefully distinguished from true variation in the rates. This paper acknowledges the variation but does not attempt to disaggregate its usage.

When presenting these indicators, we favour presenting deviations from baseline (figure 2A–E) rather than absolute rates, since comparing fatal injury rates can produce results that are unreliable or difficult to interpret. The way an injury-related death is defined, the way it is recorded on a death certificate and the sources of information used to collate the statistics may all differ between countries and thus affect the validity of the comparisons made.[4] These threats to validity are less for comparisons of trends, provided consistent methods are used within each country across the time period considered.

We are only aware of one other project that measured injury mortality data across countries—ANAMORT—which was partially funded by the EU DG SANCO.[5] However, the aim of this project (completed in 2008) was to evaluate differences in the specific ICD-9 or ICD-10 codes that were being used in eight European countries in order to improve comparability of vital death statistics reported, for example, to EuroStat. In ANAMORT the emphasis was on the selection of indicators that are based on those ICD codes, but not the actual variability or validity of those codes—albeit the issue of validity was a concern expressed in the ANAMORT discussion section.

Limitations of the mortality indicators

Despite the use of common specifications for these indicators, these comparisons could be misleading for a number of reasons. Valid international comparisons depend on good quality data and consistent definitions. Potential limitations identified by the ICE work group on mortality indicators were: variability in the quality and completeness of deaths recording; variability in specifying the manner of death on the death certificates which could influence assignment of the underlying cause of death code; and completeness, specificity and accuracy of coding underlying cause of death across countries. For example, in 2006, 18% of injury deaths in the UK were coded to unspecified mechanisms of injury while in Venezuela this proportion was only 5%. Other potential limitations were: possible use of non-comparable sources of data and, when classifying by year of death, the occurrence of undercounts where deaths registered after the year of death are not used to update the counts. If the international comparisons presented in this paper were being carried out for more than illustrative purposes, each of these potential limitations would need to be investigated for each country involved.

A further problem is that, when comparing injury death rates, we have to accept that the likelihood of death given an injury is influenced not only by severity of the injury but also by access to and the quality of health services (eg, speed of emergency services). The effect of such external factors can be reduced through international comparison of serious injury with intelligent case selection.[2] We aim to develop valid international comparisons of serious (fatal and non-fatal) injury in the medium term.

What is already known on the subject

This paper is the first to provide an international consensus on injury mortality indicators.

What this study adds

- Consensus on the most important mortality indicators for use for international comparison.
- The operational definitions for five injury-related mortality indicators for international comparison of rates and trends: (1) injury mortality rate; (2) MVTC mortality rate; (3) self-harm/suicide mortality rate; (4) assault/homicide rate; and (5) undetermined intent mortality rate.

Implications for prevention

Providing a set of agreed injury mortality indicators should facilitate setting priorities for research and intervention around the world. Although injury prevention experts know the benefits of investigating differences in rates and trends (whether because of coding differences or because of effective interventions), this paper presents the only effort to date to create internationally agreed indicators to use in the foreseeable future as developed by an expert group of injury researchers from almost 20 countries.

CONCLUSIONS

The ICE has reached a consensus on what injury mortality indicators should be used for comparison between countries. Specifications for each of these have been produced and applied successfully to the mortality data of seven countries.

Acknowledgements We thank Kavi Bhalla, Harvard University, for the WHO Mortality Database aggregated by 5-year age groups into the format of the ICD-10 External Cause of Injury Mortality Matrix and by detailed ICD-10 codes. We also thank Gordon Smith, Yvonne Robitaille and J Lee Annest for their comments on an earlier draft. We thank all the participants in the ongoing meetings of the ICE on Injury Statistics. Those who participated in the two meetings highlighted in this paper are listed in http://www.cdc.gov/nchs/injury/ice/washington2008/wdc_2008_participants.htm. Montserrat Ruiz-Pérez assisted in the manuscript preparation and submission process.

Competing interests None.

Provenance and peer review Not commissioned; externally peer reviewed.

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