

A photograph of a broken wine glass lying on its side on a white surface. The glass is shattered, with several sharp fragments scattered around it. A vibrant red liquid, resembling wine or blood, has spilled from the broken glass, creating a large, irregular puddle that spreads across the white background. The lighting is bright, highlighting the transparency of the glass and the rich color of the liquid.

# ALCOHOL AND INJURY in Emergency Departments

Summary of the Report from the WHO  
Collaborative Study on Alcohol and Injuries



# ALCOHOL AND INJURY

## in Emergency Departments

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**World Health  
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## WHY ARE ALCOHOL-RELATED INJURIES A CONCERN FOR WHO?

### Alcohol, injuries and disease burden

Worldwide there are approximately 5.2 million deaths from injuries every year and non-fatal injuries account for about one-tenth of the global burden of disease. Injuries may be divided into two categories: unintentional injuries, including road traffic injuries, drowning, burns, poisoning and falls; and intentional injuries, which result from deliberate acts of violence against oneself or others.

Alcohol is consumed by large proportions of adults in most countries around the world. Though not causing significant problems for most drinkers, alcohol use is associated with numerous negative consequences for the drinker and society at large. Globally alcohol causes 3.2% of all deaths or 1.8 million deaths annually and accounts for 4.0% of disease burden. Many of these deaths are the result of injuries caused by hazardous and harmful drinking. Of the total number of alcohol-attributable deaths, 32.0% are from unintentional injuries, and 13.7% are from intentional injuries. This means that about half of the deaths attributable to alcohol are from injuries.

The problem of alcohol-related injuries is particularly alarming in many low- and middle-income countries, where alcohol consumption is increasing, injury rates are extremely high, and appropriate public health policies have not yet been implemented. While there is little doubt that alcohol consumption is associated with injury occurrence, less is known about the level of risk at which various drinking patterns, quantities of alcohol consumed, or drinking situations place the individual at risk for accidental injury.



Half of all alcohol-related deaths worldwide are the result of an injury.

Emergency rooms are important sites to collect information about the alcohol involvement in injuries. Unfortunately, few hospitals collect this information routinely.

## **Alcohol and injuries in emergency departments**

The contribution of alcohol to injuries is particularly evident for patients presenting at hospital emergency rooms, as well as emergency departments not connected to hospitals. Some studies have estimated that 10-18% of injured patients attending emergency departments are alcohol-related cases. Thus, there is potential for brief interventions in such cases, since this might be the only medical care some of these patients receive. In order to determine how this can be done, assessment of alcohol intoxication and drinking before the injury occurred is an important step. The collection of accurate data on alcohol and injuries at hospitals is vital to an understanding of the nature and extent of the problem. Health professionals working in emergency departments should be aware of the extent to which harmful use of alcohol contributes to the health problems of their patients. To date, however, few emergency departments include the use of alcohol in their assessment of injured patients. This is in part due to the lack of appropriate tools that can be used in emergency settings to screen patients for their alcohol use and patterns of drinking.

## **Identification and recording the level of alcohol intoxication in health care settings**

The International Classification of Disease (ICD) system is a diagnostic and surveillance tool which enables national statistics to be compared in an international context. In the 10th revision of the ICD system, a new provision was made for recording the level of alcohol intoxication (based on blood alcohol concentration and observation/clinical judgment) in a patient - these are referred to as the Y90 and Y91 codes. If such a tool can be shown to be valid, reliable, and easy to use within emergency departments, it would provide an important component of an effective alcohol surveillance system. In the emergency room, it could facilitate the identification of risk factors for different types of alcohol-associated injuries, which in turn would allow policy makers to set appropriate priorities for intervention strategies to reduce alcohol related casualties.

### Y91 categories in ICD-10: Evidence of alcohol involvement determined by level of intoxication

<b>Y91.0</b>	<b>Mild alcohol intoxication</b> Smell of alcohol on breath, slight behavioural disturbance in functions and responses, or slight difficulty in coordination
<b>Y91.1</b>	<b>Moderate alcohol intoxication</b> Smell of alcohol on breath, moderate behavioural disturbance in functions and responses, or moderate difficulty in coordination
<b>Y91.2</b>	<b>Severe alcohol intoxication</b> Severe disturbances in functions and responses, severe difficulty in coordination, or impaired ability to cooperate
<b>Y91.3</b>	<b>Very severe alcohol intoxication</b> Very severe disturbance in functions and responses, very severe difficulty in coordination, or loss of ability to cooperate
<b>Y91.4</b>	<b>Alcohol involvement, not otherwise specified</b> Suspected alcohol involvement

Research from hospital emergency departments also suggests that patients who consumed alcohol prior to their injury are more likely to be heavy drinkers and have had prior experience of alcohol-related problems. Furthermore, these patients are unlikely to access health care services apart from emergency departments. The collection of accurate data on drinking patterns of these patients would therefore be useful in determining whether emergency departments can be used as intervention points for these hard to reach population groups.



Collecting accurate information on the drinking patterns of injured patients would be useful to determine interventions for hard to reach population groups.

# WHO COLLABORATIVE STUDY ON ALCOHOL AND INJURIES

## Description of the project

In view of public health importance of alcohol-related injuries and limited data on the extent and role of alcohol involvement in non-fatal injuries reported to emergency departments, particularly in developing countries, the WHO Collaborative Study on Alcohol and Injuries was initiated and implemented by the World Health Organization. This study is the first international attempt of such a scale to quantify the role of alcohol in injured persons from several different countries using the same methodology.

## Objectives of the Study

- To document the proportion of victims of non-fatal injuries with alcohol intoxication in a probability sample of emergency room patients at each site.
- To examine the context in which drinking had occurred prior to the injury and other drinking variables (amount, type of beverage, etc.) in different cultural settings.
- To collect information on the association of patterns of drinking with injuries.
- To test in different societies the ability of emergency room staff to assess and record the degree of alcohol intoxication of injured patients using ICD-10 Y91 coding.
- To develop and pilot the materials to assist emergency departments staff in assessing and coding the degree of alcohol intoxication.
- To explore the ways in which alcohol assessments/measurements could be worked into routine emergency departments practice.



## Methodology

### Study sites, design and participants

The study was conducted in 12 countries as shown in the table below. A cross sectional study design was used to collect information from 5 410 participating patients admitted to hospital emergency departments serving specific areas in the cities and their surroundings. A case-crossover methodology was also used in 10 of the participating study centres (Argentina, Belarus, Brazil, Canada, China, Czech Republic, India, Mexico, New Zealand, Sweden) to estimate alcohol's contribution to the relative risk of non-fatal injuries. Data collection across the sites took place from December 2000 to February 2002.

**Participant countries, sites and sample sizes**

Country	City	Participants meeting selection criteria
Argentina	Mar del Plata	452
Belarus	Minsk	510
Brazil	São Paulo	496
Canada	Orangeville	222
China	Changsha	559
Czech Republic	Prague	511
India	Bangalore	556
Mexico	Mexico City	456
Mozambique	Maputo	488
New Zealand	Auckland	160
South Africa	Cape Town	503
Sweden	Malmö	497

**Total sample size = 5 410**

## Sampling frame

A proportionate sampling design was used that reflected the consecutive arrival of patients to the study emergency departments. This was done to approximate a random sample, while being most suitable to the practical requirements of participating emergency departments.

## Instruments used for data collection

- An administered questionnaire was designed to collect information from patients on:
  - the type of injury sustained (classified according to the International Classification of External Causes of Injury);
  - the context in which drinking had occurred prior to the injury;
  - regular drinking patterns;
  - demographics.
- An observational methodology was used to detect the clinical signs of alcohol intoxication and their severity according to the categories specified in ICD-10 Y91 system. Clinical observers varied by site, ranging from medical doctors to trained researchers.
- Alcohol involvement was also determined by breathalyser (BAC) and coded on the Y90 scale. This was done to assess the current level of intoxication and the reliability and validity of the observational assessment (Y91).

Alcohol involvement was assessed using the ICD-10 Y90 and Y91 codes.



## RESULTS

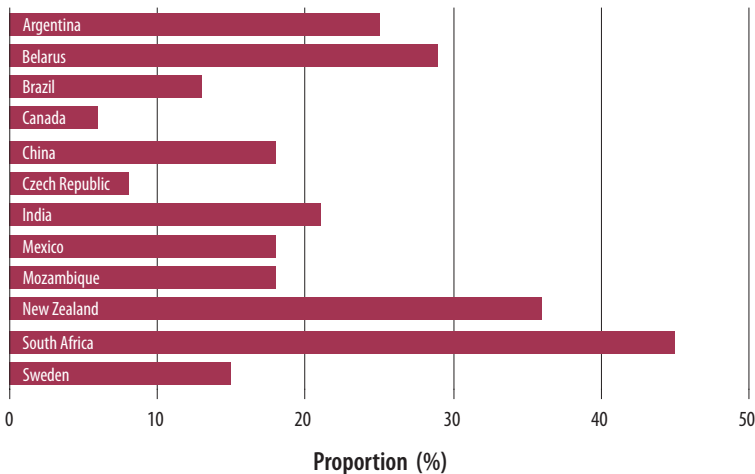
Results of the study showed that there was a clear relationship between alcohol consumption and the risk of injury in most countries.

### What was the proportion of patients drinking alcohol before their injuries?

This study found the proportion of injury cases with alcohol involvement ranged from 6% to 45% (a combined proportion for all countries was 20.4%). This is slightly higher than the 10-18% found in many other international studies. Sites in Argentina, Belarus, New Zealand and South Africa reported higher proportions of alcohol-related injury (25%, 29%, 36% and 45%, respectively). The differences between countries in the proportion of participants who consumed alcohol is likely to reflect the differences in the patterns of alcohol consumption within each country, cultural differences, differences in alcohol policies as well as the differences in service provision for injured patients.

Up to 45% of injured patients report consuming alcohol prior to their injury.

### The proportion of participants who reported consuming alcohol before their injury



## Who were patients with injuries associated with alcohol consumption?

- The majority of patients were under 35 years of age, with a peak in the late teen and young adult age groups.
- In all study centres, a higher proportion of males than females were found to have alcohol involvement in injuries.
- In the majority of centres, there was a higher prevalence of alcohol involvement among injured patients of low to middle socio economic status. In Brazil, Mozambique and Sweden, those in the low or very low income brackets comprised the majority of injury patients.
- In 11 countries patients who had consumed alcohol prior to their injuries were more likely to drink at least once a week than patients without alcohol involvement in injuries.

**Injured patients who have consumed alcohol tend to be male, young, poor and regular heavy alcohol drinkers.**

- Those who had consumed alcohol six hours prior to their injury had higher average quantities of alcohol consumption and consumed more frequently over the last year than those who had not consumed alcohol before their injuries.
- In Canada, China and South Africa a strong association was found between heavy drinking patterns and injury.

## What were the circumstances of injuries associated with drinking?

- Excluding Mozambique, a third or more of the participants reported their injury occurred within 30 minutes of their last drink. In sites in Belarus, China, Mexico and New Zealand, half of those with an alcohol-related injury reported having their last drink within 30 minutes before the time of injury.
- Across all countries, patients who consumed alcohol prior to their injury were more likely to have suffered an injury that was "intentional by someone else."
- Apart from the Asian region, a friend or acquaintance was most likely to have been the perpetrator of an intentional injury and had frequently also been drinking.
- Injuries with alcohol involvement were more likely to occur in public places in sites of all countries except in Canada and the Czech Republic, where the participant's own home was the most common location.

- People who had been drinking were more likely to be injured during leisure or play activities and were less likely injured doing paid work.
- For all countries there was only a moderate chance that the location of the last drink location was the same as the injury.

### **Was there an agreement between the different tools used to assess alcohol intoxication?**

- Agreement among the three methods of alcohol assessment used in the study was generally low.
- The highest levels of agreement regarding the level of alcohol intoxication were between self-assessment by patients themselves and clinical assessment.
- Those who performed a clinical assessment (based on Y91 codes) were able to accurately distinguish not-intoxicated participants ( $BAC < 0.059$ ) and very severely intoxicated participants ( $BAC > 0.299$ ), but their ability to estimate the level of intoxication corresponding to BAC levels in the middle categories was weak. This suggests that although the reliability of matching BAC to assessment based on the five Y91 categories is poor, the identification of alcohol involvement was significantly accurate.

**Self-reported alcohol consumption is a cheap and accurate measure of alcohol use prior to injury. All patients should be asked about their alcohol consumption when admitted to an emergency room.**

## **What barriers are there to routinely documenting the alcohol involvement of injuries in emergency departments?**

The following most common barriers to the documentation of alcohol involvement were identified in the study sites:

- Alcohol is not considered enough of an issue in emergency departments to warrant a specific recording system, despite the fact that alcohol was acknowledged as an inherent factor in the reasons for some patient admissions.
- Perception that emergency department is not appropriate place for interventions targeting alcohol use and alcohol use disorders.
- Medico-legal implications of recording alcohol intoxication (for example, in some sites medical staff was required to report to insurance companies if alcohol was involved in injury).
- Lack of recognition due to deficit in medical education and training of staff in emergency departments.
- Lack of support system: emergency department staff can identify problem but no capacity to intervene.

## **How can the recording of alcohol involvement in injuries in emergency departments be improved?**

From the study results the following main ways of improving the recording alcohol-relatedness emerged:

- A commitment to ongoing training to raise awareness of the extent to which hazardous and harmful use of alcohol is contributing to the health of patients.
- Developing clinical practice guidelines for the emergency departments as an effective mechanism for ensuring the routine documentation of alcohol involvement.
- Inclusion of a special section recording alcohol involvement as a part of the standard surveillance form used in emergency departments (for example, by integration of ICD-10 Y90/Y91 codes into standard forms).
- Reporting back to the staff of emergency departments on the usefulness of data including validation and reliability of the data collected.
- Linking/integration of screening and recording of alcohol involvement in injuries in emergency departments with specialist services and resources.

## FUTURE DIRECTIONS AND IMPLICATIONS

- The protocol used in this study proved to be feasible for implementation in different emergency clinical settings, and similar studies can be replicated in other countries. They can be included in an overall system of monitoring alcohol-related harm.
- Information gained from studies conducted in emergency departments can be used to inform policy-makers of the high burden of intentional and unintentional injuries associated with alcohol use.
- ICD-10 Y91 codes proved to be a useful tool in assessing alcohol intoxication in hospital settings and can be used in cases where breathalysers are unavailable or cannot be funded. Further work is required for improving the reliability of the assessments of alcohol intoxication.
- Further research should be done on the ethical and legal barriers to recording alcohol involvement in healthcare settings.
- Results of the study indicate that emergency departments are well positioned for identifying hazardous and harmful drinking, but further international research is needed to study the feasibility and effectiveness of interventions for alcohol problems in emergency departments.



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