

UNIT 1

Magnitude and impact of road traffic injuries

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Overview

Road traffic injuries are a growing public health and development problem. In this unit, we examine in detail the magnitude and impact of road traffic injuries using evidence at global, regional and national levels. This evidence shows how serious the problem of road traffic injuries is at present and indicates that it will become worse if no appropriate action is taken now.

Objectives

By the end of this unit, the trainee should be able to:

- describe the global magnitude and trends of road traffic fatalities;
- discuss the global socioeconomic and health burden of road traffic injuries;
- describe the magnitude and trends of road traffic injuries in his or her own country, region and city;
- discuss the socioeconomic and health burden of road traffic injuries in his or her own country, region and city.

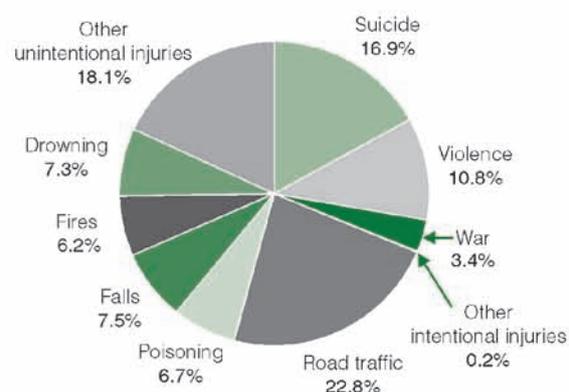
Global estimates and pattern

Data provided by the World Health Organization (WHO) and the World Bank were used for the statistical analyses that form the basis of the *World report on road traffic injury prevention* (1). In summary, these data showed that, in 2002:

- 1.2 million people died as a result of road traffic collisions. This means that on average 3242 people were killed daily on the world's roads.
- 20 million to 50 million people were injured or disabled in road collisions.
- Road traffic injuries were the 11th leading cause of death worldwide and accounted for 2.1% of all deaths globally. Furthermore, these road traffic deaths accounted for 23% of all injury deaths worldwide (Figure 1.1).
- 90% of road traffic deaths occurred in low-income and middle-income countries, where

FIGURE 1.1

Distribution of global injury mortality by cause



Source: reproduced from reference 1.

Note: Unintentional (or “accidental”) injuries are those attributable to road traffic crashes, falls, drowning and fires. Intentional (or deliberate) injuries are those attributable to violence, suicide and war.

5098 million people or 81% of the world's population live (2) and own about 20% of the world's vehicles.

- The WHO African Region had the highest mortality rate, with 28.3 deaths per 100 000 population. This was followed closely by the low-income and middle-income countries of the WHO Eastern Mediterranean Region, at 26.4 per 100 000 population (Table 1.1). Countries in the WHO Western Pacific Region and the WHO South-East Asia Region accounted for more than half of all road traffic deaths in the world.

TABLE 1.1

Road traffic injury mortality rates (per 100 000 population) in WHO regions, 2002

WHO region	Low-income and middle-income countries	High-income countries
African Region	28.3	—
Region of the Americas	16.2	14.8
South-East Asia Region	18.6	—
European Region	17.4	11.0
Eastern Mediterranean Region	26.4	19.0
Western Pacific Region	18.5	12.0

Source: reproduced from reference 1.

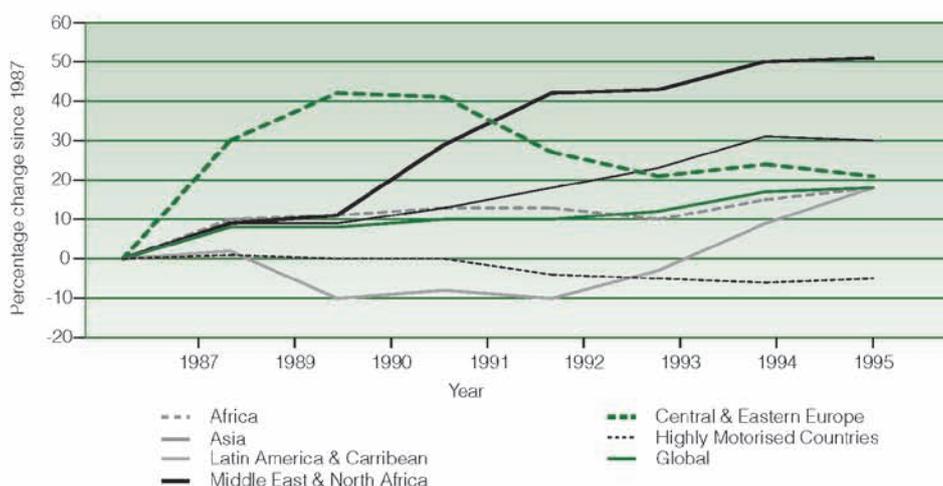
Global trends and projections

The key findings on global trends and projections presented in the *World report on road traffic injury prevention (1)* are summarized below:

- The number of road traffic injuries has continued to rise in the world as a whole, but there has been an overall downward trend in road traffic deaths in high-income countries since the 1970s, and an increase in many of the low-income and middle-income countries (Figure 1.2).
- Road traffic injuries are predicted to rise from tenth place in 2002 to eighth place by 2030 as a contributor to the global burden of diseases (Figure 1.3).
- Road traffic deaths are predicted to increase by 83% in low-income and middle-income countries (if no major action is taken), and to decrease by 27% in high-income countries. The overall global increase is predicted to be 67% by 2020 if appropriate action is not taken (Table 1.2).

FIGURE 1.2

Global and regional road fatality trends, 1987-1995^a



^a Data are displayed according to the regional classifications of TRL Ltd, United Kingdom.
Source: reproduced from reference 3.

FIGURE 1.3

Change in rank order for the 10 leading causes of death, world, 2002-2030

2002		2030	
Rank	Disease or injury	Rank	Disease or injury
1.	Ischaemic heart disease	1.	Ischaemic heart disease
2.	Cerebrovascular disease	2.	Cerebrovascular disease
3.	Lower respiratory infections	3.	HIV/AIDS
4.	HIV/AIDS	4.	Chronic obstructive pulmonary disease
5.	Chronic obstructive pulmonary disease	5.	Lower respiratory infections
6.	Perinatal conditions	6.	Diabetes mellitus
7.	Diarrhoeal diseases	7.	Trachea, bronchus, lung cancers
8.	Tuberculosis	8.	Road traffic injuries
9.	Trachea, bronchus, lung cancers	9.	Tuberculosis
10.	Road traffic injuries	10.	Perinatal conditions

Source: reference 4.

TABLE 1.2

Predicted road traffic fatalities by region (in thousands), adjusted for underreporting, 1990-2020

World Bank Region ^a	Number of countries surveyed	Year				Change (%) 2000–2020	Fatality rate (deaths per 100 000 persons)	
		1990	2000	2010	2020		2000	2020
East Asia and Pacific	15	112	188	278	337	79	10.9	16.8
East Europe and Central Asia	9	30	32	36	38	19	19.0	21.2
Latin America and Caribbean	31	90	122	154	180	48	26.1	31.0
Middle East and North Africa	13	41	56	73	94	68	19.2	22.3
South Asia	7	87	135	212	330	144	10.2	18.9
Sub-Saharan Africa	46	59	80	109	144	80	12.3	14.9
Sub-total	121	419	613	862	1 124	83	13.3	19.0
High-income countries	35	123	110	95	80	-27	11.8	7.8
Total	156	542	723	957	1 204	67	13.0	17.4

^a Data are displayed according to the regional classifications of the World Bank.

Source: reference 5.

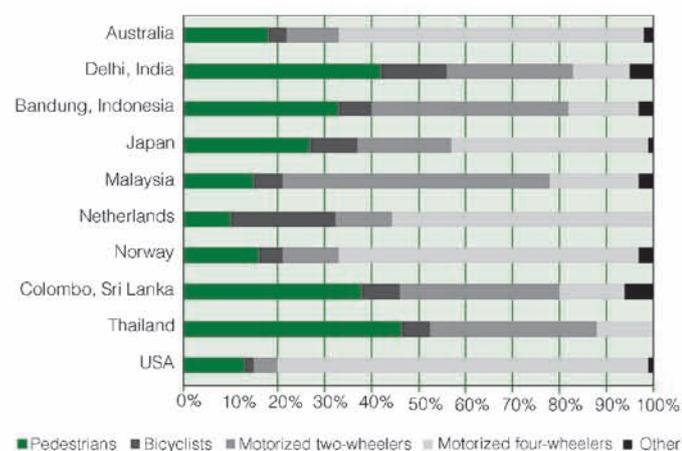
Who is affected by road traffic injuries?

The *World report on road traffic injury prevention (1)* indicates that there are notable differences in the way different road users are affected by road traffic collisions as summarized below:

- More than half of all global road traffic deaths occur among young adults between 15 and 44 years of age.
- 73% of all global road traffic fatalities are males.
- Vulnerable road users – pedestrians, cyclists and motorcyclists – account for a much greater proportion of road traffic collisions in low-income and middle-income countries than in high-income countries (Figure 1.4).

FIGURE 1.4

Road users killed in various modes of transport as a proportion of all road traffic deaths



Source: reproduced from reference 6.

Activity

Task

Look at Table 1.3 which presents data on estimated road traffic fatalities per 100 000 population in the WHO African Region for 2002. Carefully study the table and write down key features related to the distribution of road traffic fatalities per 100 000 by sex and age.

Expected results

The purpose of this exercise is to assist trainees to identify and summarize key elements in the distribution of road traffic fatalities per 100 000 population for the WHO African Region. They are to describe variations noted in this indicator by different age groups for males and females.

TABLE 1.3

Estimated mortality^a caused by road traffic injury^b in WHO African region

Age ^c in years	Males	Females
0–4	18.6	11.0
5–14	42.6	25.5
15–29	27.2	10.0
30–44	53.4	15.0
45–59	65.7	22.1
60 and above	81.9	35.8
Total	39.3	17.4

^a Mortality is measured by number of road traffic fatalities per 100 000 population.

^b Road traffic injury = ICD10 V01–V89, V99, Y850 (ICD9 E810–E819, E826–E829, E929).

^c Age-standardized.

Source: reproduced from reference 1.

Socioeconomic and health effects of road traffic injuries

Road traffic injuries cause emotional, physical and economic harm. There is a moral imperative to minimize such losses. A case can also be made for reducing road crash deaths on economic grounds, as they consume massive financial resources that countries can ill afford

to lose (3). It is important to estimate the cost of road traffic injuries to society:

- to justify the expenditure necessary in promoting road traffic injury prevention;
- to make the best use of investments when different options are available;
- to ensure that the most cost-effective safety improvements are introduced in terms of the benefits that they will generate in relation to the cost of their implementation.

Global estimates of costs of road traffic crashes

It is estimated that road traffic crashes cost (Table 1.4):

- US\$ 518 billion globally;
- US\$ 65 billion in low-income and middle-income countries, exceeding the total amount received in development assistance;
- between 1% and 1.5 % of gross national product in low-income and middle-income countries; and
- 2% of gross national product in high-income countries.

Road traffic injuries put significant strain on families (1). For everyone killed, injured or

TABLE 1.4

Road crash costs by region

Region ^a	GNP, 1997 (US\$ billion)	Estimated annual crash costs	
		As percentage of GNP	Costs (US\$ billion)
Africa	370	1	3.7
Asia	2 454	1	24.5
Latin America and Caribbean	1 890	1	18.9
Middle East	495	1.5	7.4
Central and eastern Europe	659	1.5	9.9
Subtotal	5 615		64.5
Highly motorized countries	22 665	2	453.3
Total			517.8

GNP: gross national product.

^a Data are displayed according to regional classification of the TRL Ltd, United Kingdom.

Source: reproduced from reference 3.

BOX 1.1**Cost of road traffic injuries to households**

A case study conducted in Bangladesh found that poor families were more likely than those better off to lose their head of household and thus suffer immediate economic effects as a result of road traffic injuries. The loss of earnings, together with medical bills, funeral costs and legal bills, can have a ruinous effect on a family's finances. Among poor people, 32% of the road deaths surveyed in the Bangladesh study occurred to a head of household or that head's spouse, compared to 21% among those not defined as poor. Over 70% of households reported that their household income, food consumption and food production had decreased after a road death. Three-quarters of all poor households affected by a road death reported a decrease in their living standard, compared to 58% of other households. In addition, 61% of poor families had to borrow money as a result of a death, compared with 34% of other families.

Source: based on reference 1.

disabled by a road traffic crash there are many others deeply affected. Many families are driven into poverty by the cost of prolonged medical care, the loss of a family breadwinner, or the extra funds needed to care for people with disabilities. Road crash survivors, their families, friends and other caregivers often suffer adverse social, physical and psychological effects. Various studies have made an effort to analyse some of these detailed aspects (Box 1.1) but further research is needed in this area. There is a need not only for more evidence but also for improvement in methods of data collection and analysis, especially concerning poor families and communities.

Key points

- Worldwide, about 1.2 million persons are killed in road traffic crashes every year.
- 20 million to 50 million more are injured or disabled in these crashes.
- Road traffic injuries account for 2.1% of global mortality and 23% of all injury deaths worldwide.
- The position of road traffic injuries as a contributor to the global burden of disease is predicted to rise from tenth place in 2002 to eighth place by 2030.
- Over the past four decades there has been an

overall downward trend in road traffic deaths in high-income countries and an increase in many of the low-income and middle-income countries.

- Globally, the economic cost of road traffic injuries is about US\$ 518 billion with low-income and middle-income countries accounting for US\$ 65 billion.
- Road traffic injuries put significant financial strain on families. Many families are driven into poverty by the cost of prolonged medical care, the loss of a family breadwinner or the extra funds needed to care for people with disabilities.
- Road crash survivors, their families, friends and other caregivers often suffer adverse social, physical and psychological effects.

Definitions of key concepts

- Road traffic fatality: a death occurring within 30 days of the road traffic crash.
- DALY (Disability-adjusted life year): a health-gap measure that combines information on the number of years lost from premature death with the loss of health from disability.
- Willingness to pay approach: an approach used by economists to measure the value of pain and suffering by asking people what they are willing to pay or by studying what people actually pay

for small improvements in their chance of avoiding the risk of being killed or injured.

- Prevalence costs: costs that measure all injury-related expenses during one year, regardless of when the injury occurred.
- Incidence-based costs: costs that take into account the lifetime costs that are expected to result from injuries that occur during a single year.

Questions to think about

- a) What challenges does your country face as a result of road traffic crashes?
- b) In most countries, road traffic injury costs exceed 1% of gross national product. This figure is generally considered to be an underestimate of national road crash costs. What is the estimated cost of road traffic injuries in your country? How is this estimate derived? How frequently is this estimate updated?
- c) Conduct a review of literature to establish how much research has been done on costs of road traffic injuries in your country. Look for published research on this issue in both local and international journals. This activity is meant to equip you with library research skills and the capacity to examine existing literature. You can work on your own, or with two or three colleagues. Try to summarize the results and indicate gaps in knowledge that need to be filled. Consider preparing a manuscript based on your review to submit to a journal.
- d) Identify a family you know where someone has been involved in a non-fatal road crash recently. Seek permission to gather information on the economic costs of that crash for that family. Prepare a summary of the economic costs to the

family and immediate society. Think of ways of using this information to enhance prevention of road traffic injuries in your local setting.

References

1. Peden M et al. *World report on road traffic injury prevention*. Geneva, World Health Organization, 2004.
2. *World population prospects: the 2002 revision*. Volume 1: Comprehensive tables. New York, United Nations, 2003.
3. Jacobs G, Aeron-Thomas A, Astrop A. *Estimating global road fatalities*. Crowthorne, Transport Research Laboratory, 2000 (TRL Report 445).
4. Mathers C, Loncar D. *Updated projections of global mortality and burden of disease, 2002-2030: data sources, methods and results*. Geneva, World Health Organization, 2005.
5. Kopits E, Cropper M. *Traffic fatalities and economic growth*. Washington, DC, World Bank, 2003 (Policy Research Working Paper No. 3035).
6. Mohan D: Traffic safety and health in Indian cities. *Journal of Transport and Infrastructure*, 2002, 9:79-94.

Further reading

Hauer E. Can one estimate the value of life or is it better to be dead than stuck in traffic? *Transportation Research Series A*, 1994, 28:109–118.

Trinca G et al. *Reducing traffic injury: the global challenge*. Melbourne, Royal Australasian College of Surgeons, 1988.

Notes

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Trainee's evaluation of Unit 1: Magnitude and impact of road traffic injuries

This form is to be completed by the trainee at the end of this unit to assess the content and approach used. This evaluation is helpful to the trainee, trainer and developer of this manual.

1. To what extent did you achieve the objectives set for this unit? (Please check once using "X" for each objective)

Objectives	Completely successful	Generally successful	Completely unsuccessful
Describe the global magnitude and trends of road traffic fatalities.			
Discuss the global socioeconomic and health burden of road traffic injuries.			
Describe the magnitude and trends of road traffic injuries in your own country, region and city.			
Discuss the socioeconomic and health burden of road traffic injuries in your own country, region and city.			

2. What is your overall rating of the content presented in this unit? (Please check one using "X")

Scale	Excellent	Better than expected	Satisfactory	Below average
Rating				

3. How do you rate the balance between theoretical and practical content in this unit? (Please check one using "X")

Scale	Good balance	Too theoretical	Too practical
Rating			

4. a) Did you find the activities presented in the unit helpful? (Please check one)

Yes _____ No _____

- b) If yes, in what ways were they helpful? What improvements do you suggest?

- c) If no, what were the shortcomings? What suggestions do you have to make them helpful?

5. What did you like most about the unit?

6. What did you like least about the unit?

7. What did you learn most from this unit?

8. Explain how your organization, community, city and country, and other interested parties will benefit from your having read this unit.

9. What do you think should be added to this unit?

10. What do you think should be dropped from this unit?
