



Regional Report on
Status of Road Safety:
the South-East Asia Region



**World Health
Organization**

Regional Office for South-East Asia

Regional Report on Status of Road Safety: the South-East Asia Region

A Call for Policy Direction

WHO Library Cataloguing-in-Publication data

World Health Organization, Regional Office for South-East Asia.
Regional report on status of road safety: the South-East Asia Region.

1. Accidents, Traffic - prevention and control. 2. Automobile Driving - legislation and jurisprudence – education. 3. Alcohol Drinking 4. Head Protective Devices - utilization. 5. Safety. 6. Data Collection - statistics and numerical data.

ISBN 978-92-9022-355-9

(NLM classification: WA 275)

© World Health Organization 2009

All rights reserved.

Requests for publications, or for permission to reproduce or translate WHO publications – whether for sale or for noncommercial distribution – can be obtained from Publishing and Sales, World Health Organization, Regional Office for South- East Asia, Indraprastha Estate, Mahatma Gandhi Marg, New Delhi 110 002, India (fax: +91 11 23370197; e-mail: publications@searo.who.int).

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use.

Printed in India

Made possible through funding from Bloomberg Philanthropies

Contents

Preface	v
Executive summary	vii
Acknowledgements	x
1. Background	1
Road traffic injury prevention efforts	5
2. The need for situation analysis	9
3. Road traffic injury scenario	13
Road traffic injuries: An epidemic in the Region	13
Vulnerable road users	17
Data on economic cost	18
Registered vehicles.....	19
Safety law exists but the level of implementation is suboptimal	21
Speed	21
Alcohol	23
Helmets	26
Seat-belts and child restraints.....	29
Synopsis of legislative issues	31
Pre-hospital care system	31
All participating countries have the institutional framework for road traffic injury prevention	33
Other measures to reduce exposure and prevent road traffic injuries	34
4. Conclusions and recommendations	37
Main messages from the Report.....	39
Recommended actions	40
References	44
Explanatory notes for Statistical Annex	46
Background.....	46
Data processing	46
Reporting of country-level data	46
Types of data utilized	47
Reported data	47
Adjusted data	47
Modelled data	47
Estimation method	48
References.....	50

Country profiles.....	59
Bangladesh.....	64
Bhutan.....	68
India.....	72
Indonesia.....	76
Maldives.....	80
Myanmar.....	84
Nepal.....	88
Sri Lanka.....	92
Thailand.....	96
Timor-Leste.....	100

Preface

Over the last few decades there have been fundamental changes in disease patterns among the people of Member States of the WHO South-East Asia Region due to rapid urbanization and economic growth. The pattern of mortality and morbidity with regard to communicable and noncommunicable diseases in these Member States has changed. From being largely linked to infectious diseases earlier, it is now mainly related to noncommunicable diseases as well as injuries and violence. Road traffic injuries have emerged as one of the leading causes of death and disability in most countries of the Region.

The *Regional Report on Status of Road Safety: the South-East Asia Region* provides an opportunity to depict the extent and scale of this particular problem. Road traffic injuries are one of the fastest growing epidemics in the South-East Asia Region, and more than 285 000 people are dying on the roads every year. The trend in road traffic deaths in most Member States of the Region has also been on an upward spiral in recent years.

Historically, most of those killed on the roads in accidents are young and aged between 15 and 44 years, thus corresponding to the most economically productive segment of the population. Hence, road traffic injuries lead to a colossal economic burden at both the family and community levels on Member States of the Region.

The report reveals that almost three quarters of all road traffic deaths in South-East Asia occur among the most vulnerable road users, i.e., pedestrians, motorcyclists and cyclists. This report also reaffirms our understating of the rapid growth of two- and three-wheelers in the Region, which is a major risk factor in road traffic injuries. These two critical issues should be prioritized during policy decisions on road safety.

Although primary prevention is a far better option to address the huge toll from road traffic injuries than other measures, only a few Member States in the Region have specific preventive measures on road traffic injuries in place. Measures that will reduce injuries and contribute to a healthier future may include appropriate land use planning, setting safety standards for vehicles, designing infrastructure keeping the protection of pedestrians and

motorcyclists in mind, promoting safe public transport, and campaigning for the improvement of personal behaviour on roads. To realize this goal and implement these measures it is imperative to develop and sustain strong intersectoral partnerships and collaboration.

This is the first report published on the status of road safety in Member States of the South-East Asia Region. This report provides policy-makers and public health practitioners in the Region with a set of recommendations for the development of interventions to prevent avoidable deaths and injuries from road traffic accidents. I trust this report will provide the necessary impetus as well as serve as a benchmark for developing policy directions on road safety in the Region.

Executive summary

Introduction: Road traffic injuries kill nearly 1.3 million women, men and children around the world every year and are responsible for hundreds of thousands of injuries and disability. World Health Organization estimates predict that road traffic injury will increase from being the ninth leading cause of death globally in 2004 to be the fifth leading cause of death by 2030. In 2004, road traffic injury was the tenth leading cause of death in the WHO South-East Region and was responsible for 2% of all causes of mortality.

Need for situation analysis: To address the huge burden of road traffic injuries the *World Report on Road Traffic Injury Prevention* was launched in 2004. Following the launch, several resolutions have been adopted by the UN General Assembly and one by the World Health Assembly which endorsed the recommendations of the Report. Consequently, a number of countries have taken positive steps to begin to address their road safety problem. As more countries begin to take these steps it has become apparent that regular global as well as regional assessments of road safety are needed to improve road safety status.

Methodology: A self-administered questionnaire was developed by WHO using the recommendations of the *World Report on Road Traffic Injury Prevention* as the basis for its structure and content to gather information on the status of road safety. Data from the participating countries of the South-East Asia Region were collected using the global questionnaire. In each participating country a National Data Coordinator coordinated the data collection process, facilitated the consensus meeting for developing final country data set, entered the country data into the database set up for this project, and obtained approval from the relevant government authority for using country data in the global as well regional report. Ten countries (all Member States of the Region except DPR Korea) participated in the survey. All data were compiled and analysed by WHO headquarters (HQ) at the central level. To avoid definition-related bias, modelled data for deaths were considered to estimate the magnitude of the problem. The WHO Regional Office for South-East Asia (WHO SEARO) also compiled regional data and performed sub-analysis of data in the regional context.

Findings: All participating countries have a national framework for addressing road traffic injuries. Funding is available for the lead agencies to carry out road safety activities in seven participating countries. This survey found that approximately 288 768 people were killed in 2007 on the roads in 10 of the 11 countries that make up the WHO South-East Asia Region. The highest mortality rates per 100 000 population were observed in Thailand (25.4), Myanmar (23.4) and the Maldives (18.3). An upward trend in road traffic deaths has also been observed in most participating countries of the Region. It was found that males were almost three times more likely to be victims of road traffic deaths than females. Almost three quarters of road traffic deaths are among vulnerable road-users (pedestrians, motorcyclists and cyclists). It was evident from the survey that motorized two- and three-wheeled vehicles constituted more than 60% of the registered vehicles in all participating countries of the Region except for Bhutan.

All the participating countries reported at least one law related to the five major risk factors (speed, drink-driving, helmets, seat-belts and child restraints) at the national or sub-national level, although these are not all comprehensive in scope. Existing laws appear to be inadequately enforced in most of the countries. Only four participating countries have a formal publicity mechanism in place at national level on the pre-hospital care system and few participating countries have enforced different measures to reduce exposure and prevent road traffic injuries.

Conclusion and recommendations: This report gives us, for the first time, a detailed assessment of the magnitude of road traffic injuries as well as the existence of related institutions, policies, legislation and data-collection systems, and perceived levels of enforcement of legislation at the country level in the South-East Asia Region. During the last couple of years an increase in road safety awareness has been observed in a few Member countries of the Region. However, the findings of this *Regional Status Report* show that much more needs to be done. To reduce the toll of road traffic injuries in the South-East Asia Region, governments and others involved in road safety activity are encouraged to consider the key recommendations of this Report, which are:

1. Strengthen lead agencies with authority, status and resources to guide, develop, coordinate, implement and evaluate road safety issues, policies and programmes.

2. Develop strategic guidelines for road traffic injury prevention with specific measurable targets.
3. Develop and implement specific actions to prevent road traffic injuries, such as:
 - (a) speed control on all arterial roads, urban and intercity areas and national highways; traffic calming in all urban roads and on highways outside the urban areas; and enforcing a speed limit of <50 km/h on urban roads;
 - (b) strict enforcement of mandatory helmet laws for two-wheeler riders (both drivers and pillion-riders);
 - (c) enforcement of drink-driving law (maximum BAC should be 0.05 g/dl for adult drivers and less than 0.02 g/dl for young/novice drivers);
 - (d) enforcement of seat-belt use and use of child restraints;
 - (e) enforcement of all road safety laws needs to be improved. Enforcement efforts must be well-publicized, sustained and implemented through the use of appropriate measures and penalties for infringement;
 - (f) mandatory formal road safety audits for all proposed road construction projects and for existing road infrastructure;
 - (g) segregation of traffic into slow- and fast-moving vehicles on all possible roads with provisions for safe travel of pedestrians, bicycles, motorcycles and buses;
 - (h) setting safety standards for vehicles, especially for motorcycles;
 - (i) establishing pre-hospital trauma care systems with nationwide universal access phone number;
 - (j) modification of products, especially the standardizing of helmets for adults and children; and,
 - (k) promotion of life skills development and behaviour change, etc.
4. Reinforce injury information system.
5. Develop human resources and enhance resource allocation.

Acknowledgements

This publication has been prepared by the World Health Organization's Regional Office for the South-East Asia as part of a global initiative for road traffic injury prevention.

Invaluable inputs for collection of country-level data for this Report were made by the WHO Representatives and staff in Member countries, the National Data Coordinators (Table B.1 in Statistical Annex) and all respondents (Table B.2 in Statistical Annex). The cooperation of all government officials concerned in endorsing the information for inclusion in the Report is gratefully acknowledged.

The Report also benefited from the contributions of a number of people. In particular, Dr Witaya Chadbunchachai who reviewed the report and Prof. Md. Shamsul Hoque (Accident Research Institute), Mr Harman Singh Sidhu (AriveSafe, India), Dr Zaw Wai Soe (Yangon General Hospital, Myanmar) and Ms Suchada Gerdmongkolgan (Ministry of Public Health, Thailand) who provided the photograph.

Several WHO staff at both WHO/SEARO and WHO/HQ were involved in data management (compiling, cleaning, validating and analyzing), in drafting the report and reviewing it. Their inputs are greatly appreciated.

Finally, the WHO Regional Office for South-East Asia thanks Bloomberg Philanthropies for its generous financial support for the development and publication of this Report.

Background

1

Worldwide, there is consensus that low-income and middle-income countries are passing through an epidemiological transition. The pattern of mortality and morbidity in these countries is changing from infectious diseases to noncommunicable diseases as well as injuries and violence. The World Health Organization (WHO) estimates that every day around the world almost 16 000 people die from injuries and violence, and that this accounted for 9.8% of the world's deaths and

12.3% of the world's burden of disease¹ in 2004. In particular, injuries and violence accounted for 17% of the disease burden among adults aged 15–59 years in 2004⁽¹⁾.

Road traffic crashes cause many severe injuries and a large number of deaths each year and, therefore, road

¹ Burden of disease, the time-based measure, combines years of life lost due to premature mortality and years of life lost due to time lived in states of less than full health (disability).



traffic injuries are increasing being recognized as an important public health problem. They claim the lives of nearly 1.3 million women, men and children around the world every year and are responsible for hundreds of thousands of injury and disability.

The situation is particularly acute in low-income and middle-income countries which account for more than 90% of such deaths—despite these countries owning less than half of all motor vehicles(2). The *Global Burden of Disease Study* (2004 update) showed that in 2004, road traffic injuries was the world's ninth most important health problem(3). World Health Organization estimates predict

that road traffic injury will increase from being the ninth leading cause of death in 2004 to the fifth leading cause in 2030 (Table 1) (3). This is mainly due to the increasing number of road traffic crashes in low-income and middle-income countries. It is becoming increasingly evident that poor and vulnerable groups in low-income and middle-income countries have a disproportionate share of the burden arising from road traffic injuries(4). Although the epidemic of road traffic injuries in low-income and middle-income countries is still in its early stages, it threatens to grow exponentially unless swift action is taken to counter it(5).



Table 1: Leading causes of death in 2004 and 2030 compared (global scenario)

Rank	2004 Disease or injury	As % total deaths	Rank	2030 Disease or injury	As % total deaths
1	Ischaemic heart disease	12.2	1	Ischaemic heart disease	14.2
2	Cerebrovascular disease	9.7	2	Cerebrovascular disease	12.1
3	Lower respiratory infections	7.0	3	Chronic obstructive pulmonary disease	8.6
4	Chronic obstructive pulmonary disease	5.1	4	Lower respiratory infections	3.8
5	Diarrhoeal diseases	3.6	5	Road traffic injuries	3.6
6	HIV/AIDS	3.5	6	Trachea, bronchus, lung cancers	3.4
7	Tuberculosis	2.5	7	Diabetes mellitus	3.3
8	Trachea, bronchus, lung cancers	2.3	8	Hypertensive heart disease	2.1
9	Road traffic injuries	2.2	9	Stomach cancer	1.9
10	Prematurity and low-birth weight	2.0	10	HIV/AIDS	1.8
11	Neonatal infections and other ^a	1.9	11	Nephritis and nephrosis	1.6
12	Diabetes mellitus	1.9	12	Self-inflicted injuries	1.5
13	Malaria	1.7	13	Liver cancer	1.4
14	Hypertensive heart disease	1.7	14	Colon and rectum cancer	1.4
15	Birth asphyxia and birth trauma	1.5	15	Oesophagus cancer	1.3
16	Self-inflicted injuries	1.4	16	Violence	1.2
17	Stomach cancer	1.4	17	Alzheimer's and other dementias	1.2
18	Cirrhosis of the liver	1.3	18	Cirrhosis of the liver	1.2
19	Nephritis and nephrosis	1.3	19	Breast cancer	1.1
20	Colon and rectum cancer	1.1	20	Tuberculosis	1.0

^a This category also includes severe neonatal infections and other non-infectious causes arising in the perinatal period apart from prematurity, low birth weight, birth trauma and asphyxia.

The cost of road traffic injuries is enormous—having been estimated at US\$ 518 billion each year. This is approximately 1% to 1.5% of the gross domestic product (GDP) in low-income and middle-income countries and around 2% in high-income countries(6). Though only one person may be involved in a road traffic crash, the entire household can be affected financially, socially and emotionally. Impacts include direct costs such as medical and funeral costs as well as indirect costs such as loss of work time. Crash victims are often working-age adults, whose families are then left without a breadwinner or bear the added expenses of caring for a disabled family member (*Box 1*).

Box 1: Cost of road traffic injuries in Bangladesh

A study in Bangladesh found that 70% of families experienced a decline in household income and food consumption after the death of their family member in a road traffic accident. Victims and their family members frequently experience depression, travel-related anxiety and sleep disturbance for years after a crash.

The study also estimated the national cost of road traffic crashes including property damage, administration, lost output, medical and human costs which is estimated Taka 38 billion (US\$ 644 million) per year. This is 1.5% of GDP and three times the annual expenditure of the roads and highways department. However, even these costs are considered conservative because the study did not take into consideration: (a) the number and cost of those permanently disabled; (b) travel time lost due to road traffic crashes; and (c) the value of prevention, i.e. how much the general public would be willing to spend in order to reduce the risk of road traffic crashes.

Source: Silcock B R. *Guidelines for estimating the cost of road crashes in developing countries*. London, Department for International Development, 2003 (Transport Research Laboratory Project R7780).

Road traffic injuries are one of the fastest growing epidemics in the South-East Asia Region. Every hour 40 people in the Region die as a result of a collision. It is estimated that 306 000 people were killed on the roads of countries of the South-East Asia Region in 2004(1).

Every hour 40 people in the South-East Asia Region die as a result of road traffic injuries

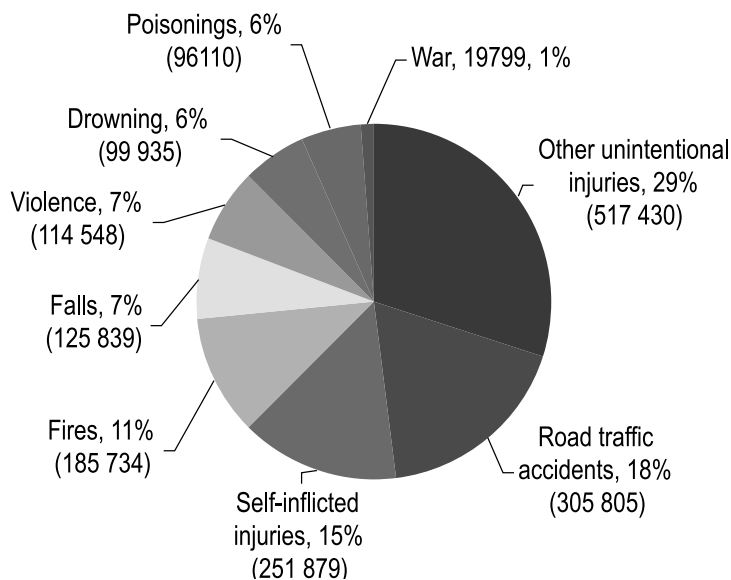
The burden of road traffic injuries has been rising rapidly in the South-

East Asia as countries increasingly motorize. According to The *Global Burden of Disease Study* (2004 update)(1), road traffic injury was the tenth leading cause of deaths in the Region responsible for 2% of all causes of mortality. The study also revealed that road traffic injury was the leading cause of mortality due to injury, accounting for 18% of injury-related mortality (*Figure 1*).

In many South-East Asian countries, a rapid increase in the number of motorized two- and four-wheelers, mixed traffic flows, inadequate infrastructural safety features, suboptimal levels of

traffic safety law enforcement, and inadequate postcrash response are some of the major factors responsible for the increasing number of road traffic injuries and deaths.

Figure 1: Injury-related mortality in the South-East Asia Region, 2004

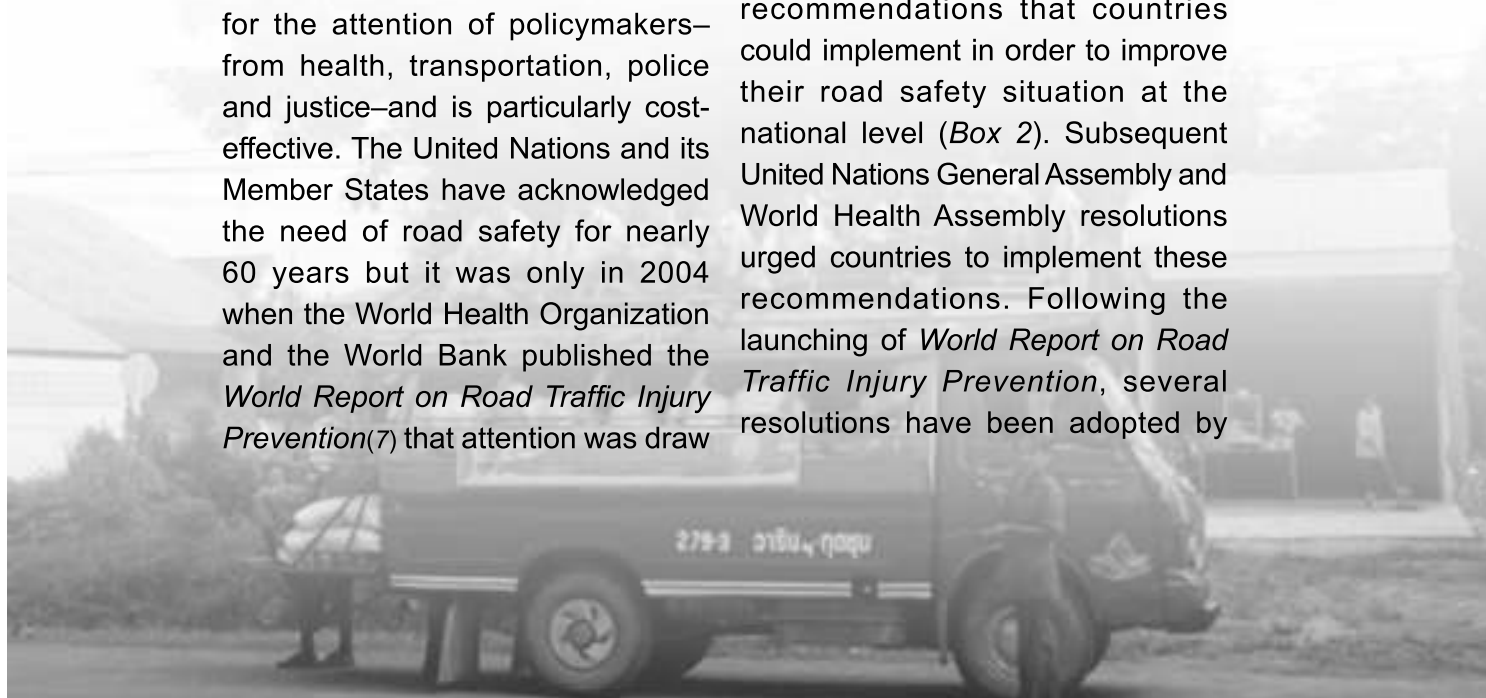


Source: WHO, Geneva, Global Burden of Disease Study (2004 update).

Road traffic injury prevention efforts

Preventing road traffic crashes and injuries is an important area that calls for the attention of policymakers—from health, transportation, police and justice—and is particularly cost-effective. The United Nations and its Member States have acknowledged the need of road safety for nearly 60 years but it was only in 2004 when the World Health Organization and the World Bank published the *World Report on Road Traffic Injury Prevention*(7) that attention was draw

to the huge toll from road traffic injuries on the health sector and the need to step up efforts around the world. The Report made six recommendations that countries could implement in order to improve their road safety situation at the national level (Box 2). Subsequent United Nations General Assembly and World Health Assembly resolutions urged countries to implement these recommendations. Following the launching of *World Report on Road Traffic Injury Prevention*, several resolutions have been adopted by



the UN General Assembly and one endorsed the recommendations of the
by the World Health Assembly which Report (*Box 2*).

Box 2: Recommendations of the *World Report on Road Traffic Injury Prevention*

1. Identify a lead agency in government to guide the national road traffic safety effort.
2. Assess the problem, policies and institutional settings relating to road traffic injury and the capacity for road traffic injury prevention in each country.
3. Prepare a national road safety strategy and plan of action.
4. Allocate financial and human resources to address the problem.
5. Implement specific actions to prevent road traffic crashes, minimize injuries and their consequences, and evaluate the impact of these actions.
6. Support the development of national capacity and international cooperation.

Source: Peden M., et al., eds. *World Report on Road Traffic Injury Prevention*. Geneva, Switzerland, World Health Organization, 2004.

Transport Ministers of the Association of South-East Asian Nations (ASEAN) gathered in Phnom Penh, Cambodia, on 23 November 2004 for the 10th ASEAN Transport Ministers' (ATM) Meeting. The meeting concluded with a declaration on raising safety standards on ASEAN roads (2004 Phnom Penh Ministerial Declaration on ASEAN Road Safety). Since three of the participating countries (Indonesia, Myanmar and Thailand) were members of ASEAN, this Declaration would have had a positive impact in drawing the policy-makers' attention. However, another Declaration on improving road safety in Asia and the Pacific was made during the meeting of senior government officials (Ministerial Conference on

Transport) in 2006 in Busan, Republic of Korea. The Declaration invites the members and associate members of the Commission to implement the recommendations contained in the *World Report on Road Traffic Injury Prevention* in line with UN General Assembly resolution 60/5 of 26 October 2005 on improving global road safety.

Although, several initiatives have been taken in different parts of the globe by a number of national and international organizations, including the United Nations, to improve the road traffic injury situation, road traffic injuries continue to be a neglected public health problem in most Member States of the WHO South-East Asia Region.

๓๖ อ.วังน้อย
Wang Noi
กรุงเทพ
Bangkok
←

352 อ.ธัญบุรี
Thanyaburi
↓



The need for situation analysis



As more countries continue to take steps towards addressing their national road safety problem, regular global as well as regional assessments of road safety are needed. Such assessment requires a standardized methodology that can provide governments, donors, practitioners, planners and researchers with the information that they need to make evidence-based decisions.

In August 2007 WHO began to develop the *Global Status Report on Road Safety* (GSRRS) to address this data gap and assess road safety around the world. The specific objectives of the project were:

- to assess the status of road safety in all WHO Member States using a core set of road safety indicators and a standardized methodology;
- to indicate the gaps in road safety; and
- to help countries identify the key priorities for intervention, and to stimulate road safety activities at the national level.

Using the data collected for this global initiative and published in the *Global Status Report on Road Safety: Time for Action*(2), this regional report on status of road safety for the South-East Asia Region explores the magnitude of road traffic injuries and efforts to address the problem in the Region. Most Member States are still at the incipient stage of addressing the problem and hence this assessment is essential to provide baseline data and specific recommendations so that progress at a national level within the Region can be measured over time.

Methodology

A self-administered questionnaire was developed by WHO using the recommendations of the *World Report on Road Traffic Injury Prevention* as the basis for its structure and content to gather information on the status of road safety in all WHO Member States. The questionnaire addresses the following areas:

- National set up and policy (lead agency for road safety activity, national strategy on road safety and funding).
- Data (road traffic deaths/injuries and costs of road traffic injuries).
- Exposure to risk (number of registered vehicles, national policies to encourage non-motorized modes of transport and to support public transport).
- Infrastructure and vehicle standards (road safety audit, manufacturing standard and vehicle inspection).
- Legislation (some main behavioural risk factors, e.g. speed, drink-driving, motorcycle helmet use, seat-belts and use of child restraints, and perception of enforcement levels of this law by the respondents).
- Postcrash care (existence of formal publicly available pre-hospital care system and universal access phone number for pre-hospital care).

The questionnaire was used to collect data from 10 of the 11 Member States of the South-East Asia Region. In each country a National Data Coordinator (*Table B.1 in the Statistical Annex*) was recruited to coordinate the data collection process, facilitate the consensus meeting to finalize country data, obtain approval from the relevant government authority for



using country data in the global as well regional report, and enter the country data into the database set up for this project. Before starting data collection at the country level all National Data Coordinators were provided with training on the methodology and tools for collection.

The National Data Coordinators in each country worked closely with the WHO country offices and Regional Office to identify respondents for the consensus meeting (*Table B.2 in the Statistical Annex*). In some countries National Data Coordinators directly communicated with the relevant ministries and institutes to identify respondents. Since the questionnaire covers a broad range of road safety issues; participants from the following sectors were identified as the respondents to adequately answer the range of questions:

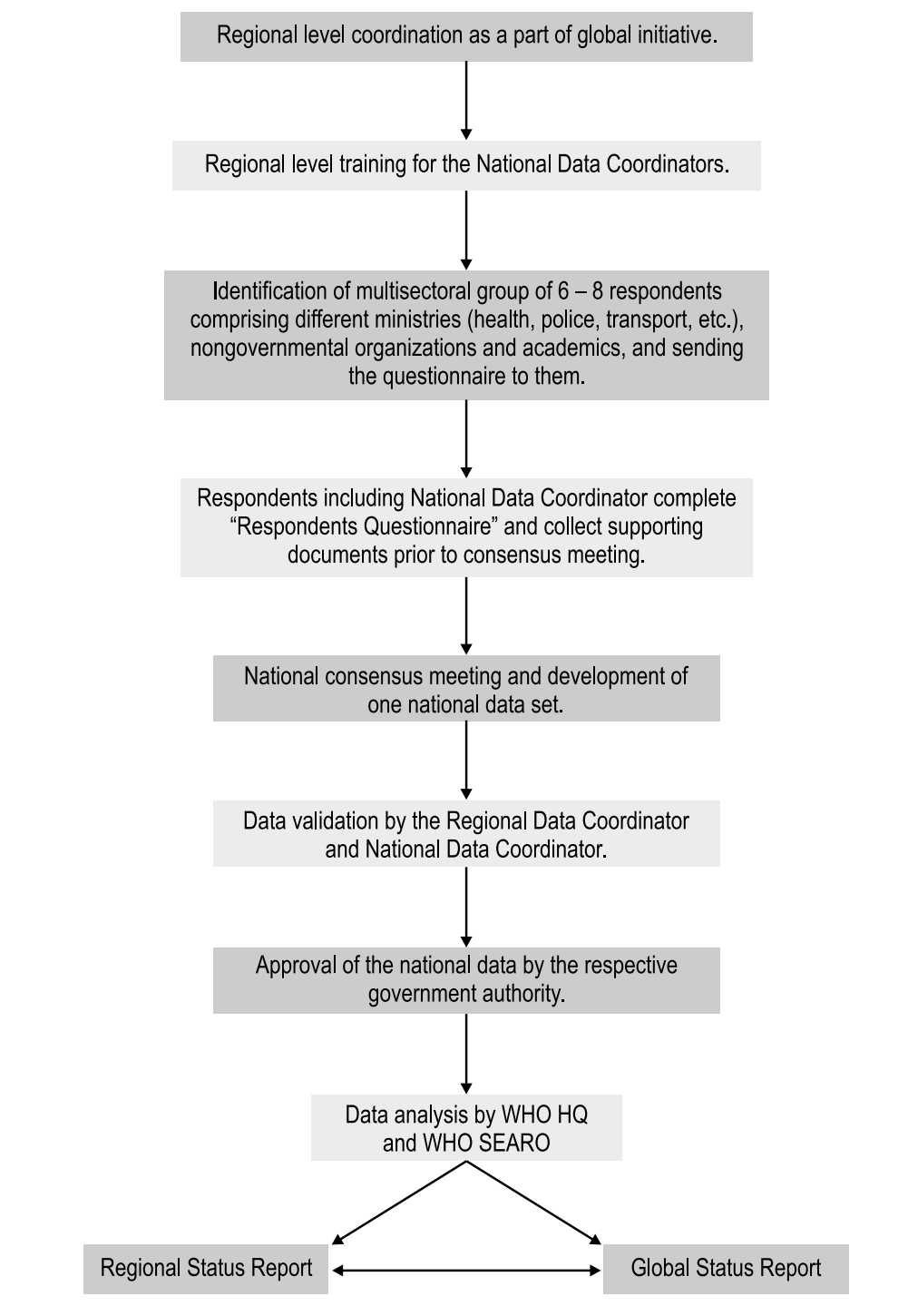
- Ministry of Health/Dept responsible for public health;
- Ministry of Transport/Ministry of Highway;
- Ministry responsible for law enforcement/police;
- National statistics office;
- Academics having experience in road traffic injury research; and,

- Nongovernmental organizations involved in road safety activities.

In the South-East Asia Region, data collection began in April 2008 and was completed in June 2008. All Member States of the South-East Asia Region except DPR Korea participated in the survey. Each respondent was asked to complete the questionnaire independently and then invited to discuss the answers to each question at the consensus meeting where they would agree as a group on one final country response. This was then submitted to WHO SEARO, except in the case of Timor-Leste where the National Data Coordinator along with Regional Data Coordinator interviewed the respondents.

Thereafter, the Regional Data Coordinator and National Data Coordinators validated all data based on supporting documents (*Figure 2*). The final data set was then sent to the respective country for clearance/approval through the relevant government authority. All data were analysed by WHO headquarters with sub-analyses conducted in SEARO. We have considered the modelled data to avoid definition-related bias in calculating death rates.

Figure 2: Methodology of the survey



Road traffic injury scenario

3

Road traffic injuries: An epidemic in the Region

According to the results of this survey, approximately 288 768 people were killed on the roads in 10² of the 11 countries of the WHO South-East Asia Region in 2007³. Almost 73% of

An estimated 288 768 people died due to road traffic injuries in the South-East Asia Region in 2007.

this burden belongs to India, which accounts for approximately 66% of the Region's population. However, the highest mortality rate per 100 000 population was observed in Thailand (25.4), followed by Myanmar (23.4) and Maldives (18.3) (*Table 2*).

² DPR Korea did not take part in the survey.

³ Reported data were adjusted to reflect a 30-day definition of road traffic death. Underreporting issues were taken into consideration during managing the global

data and a statistical model using negative binomial regression was developed and applied to those countries with known poor vital registration systems (see *Statistical Annex*).



Table 2: Road traffic deaths (per 100 000 population) in 10 countries of the South-East Asia Region (using modelled data), 2007*

Country	Population ^a	Reported number of deaths ^b	Modelled number of deaths ^c		Estimated road traffic death rate per 100 000 population ^c
			Point estimate	90% confidence interval	
Bangladesh	158 664 959	4 108	20 038	14 882–29 155	12.6
Bhutan	658 479	111	95	72–115	14.4
India	1 169 015 509	105 725	196 445	155 727–266 999	16.8
Indonesia	231 626 978	16 548	37 438	29 785–65 158	16.2
Maldives	305 556	10	56	37–105	18.3
Myanmar	48 798 212	1 638	11 422	6 905–16 883	23.4
Nepal	28 195 994	962	4 245	3 453–5 288	15.1
Sri Lanka	19 299 190	2 334	2 603	2 185–3 097	13.5
Thailand	63 883 662	16 240	16 240	-	25.4
Timor-Leste	1 154 775	49	186	143–255	16.1

(Source: Government approved data from the participating countries)

* Except Bangladesh (2006), Bhutan (mid 2006-mid 2007) and India (2006). Indian data for 2007 is available.

^a Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2007). *World population Prospects: The 2006 Revision, Highlights*. New York: United Nations.

^b Adjusted for 30-day definition of a road traffic death.

^c Modelled using negative binomial regression (see http://www.who.int/violence_injury_prevention/road_safety_status/methodology/en/index.html for detailed methodology).

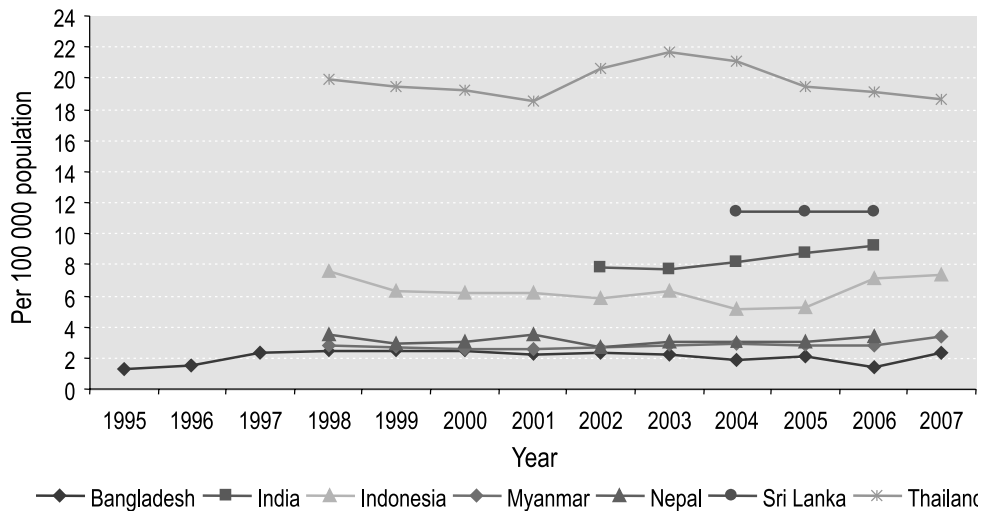
Most countries in the Region have begun to collect data on road traffic death routinely over the last decade. It is evident from the available data on trends in road traffic deaths from countries that there is a perceptible rise in cases of road traffic deaths in Bangladesh, Indonesia and Myanmar, as well as

Males are almost three times more likely to be victims of road traffic deaths than females in the South-East Asia

in India (Table A.1 in the Statistical Annex). A slight downward trend in deaths has been observed in Thailand in the past few years (Figure 3).

Males in all countries of the Region are almost three times more likely to die due to road traffic accidents than females (Figure 4).

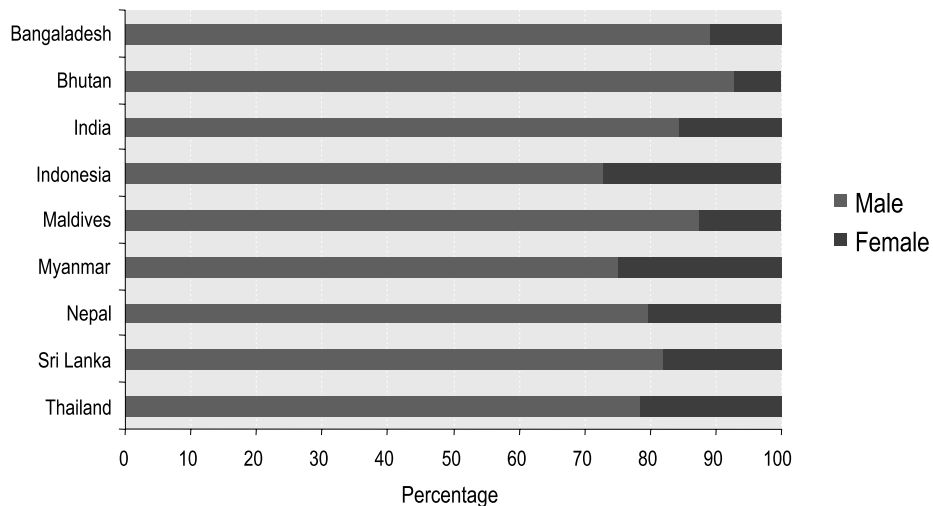
Figure 3: Road traffic deaths rate (per 100 000 population^a) trends in the South-East Asia Region (using actual data updated from countries), 1995 - 2007



(Source: Government approved data from the participating countries.)

^a Populations of the respective year have been cited from the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, <http://esa.un.org/unpp>.

Figure 4: Road traffic deaths in nine countries of the South-East Asia Region, classified by sex, 2007*



(Source: Government approved data from the participating countries.)

* Except Bangladesh (2006), Bhutan (mid-2006 – mid-2007) and India (2006). Indian data for 2007 is available.

Reported data on road traffic injuries is known to underestimate the true extent of the road safety problem in many countries, particularly in low-income ones. Participating countries provided information on road traffic deaths from different sources—mainly the police—which are known to underreport (*Box 3*). Besides, variations among the countries in defining what constitutes a road traffic death were observed⁴. Thus, a number of underreporting issues, including variations in defining death,

⁴ Deaths at the scene of crash are considered as fatal cases in Bangladesh and Maldives. In Nepal, died within 35 days of a crash are recorded as fatal cases. The rest of the countries use standard definition of death (died within 30 days of crash) to record fatal cases. Although there is no standard definition in Timor-Leste, at the consensus meeting all respondents agreed that “died within a week following a crash” could be considered as a fatal case.

were taken into consideration at the time of managing the global data.

Hence, a statistical model was developed (using negative binomial regression) and applied to those countries with known weak vital registration systems (completeness less than 85%) or with more than 30% of deaths undefined (see *Explanatory Notes on Page 46*). We have considered the modelled data to avoid definition-related bias while calculating death rates. For instance, the actual number of deaths in Bangladesh was 4108 (on spot) but the modelled number is 20 038 ranging from 14 882 to 29 155, the number of road traffic deaths (30-day definition) reported by India was 105 725 but the modelled number for India is 196 445 with a range of 155 727 to 266 999.

Box 3: Police record is grossly underreported in the Region: A report from Nepal

Underreporting of road traffic deaths and injuries is a critical issue in the South-East Asia Region. Availability of reliable, accurate and valid data is fundamental in preventing road traffic injuries.

A study conducted in Nepal revealed that compiling the accurate number of road accidents is difficult. Only those accidents with severe degree of injury or property damage or with accompanying disputes are reported and recorded by the police. The total number of road traffic accidents in Nepal (Year 2062-63 (2006)) was 1752. Of these 102 cases were fatal, followed by 345 serious injuries. However, long-term effects of accidents are not recorded by the Valley Traffic Police. Hence, the police report on road traffic injuries does not reflect the actual scenario.

Source: Joshi S.K.. Injuries in Nepal: A growing public health problem. *Kathmandu University Medical Journal*, 2007.5(1):2-3

In addition, road traffic injuries data are largely underreported due to classification and coding errors as well as poorer reporting processes. For example, Maldives has no nationwide system to record road traffic injuries data (Table A.2 in the Statistical Annex).

Injury data could not be analysed and compared since the data provided by the participating countries is from different years and sources. However, the ratio between death and injury in the available data was 1:5, which is not similar to the previous estimates at the global as well as regional level (the *Global Status Report on Road Safety* showed a ratio of 1:20 between deaths and severe injuries).

A study conducted in Delhi revealed that the rates of morbidity; disability and mortality per 1000 population due to road traffic injuries were 18.5, 3.4 and 0.4 respectively(8) while global data showed that for lifetime exposure, the average person in a developed country has a 1% risk of death and a 30% risk of injury(9). Probably the vast difference in ratio is due to gross underreporting of injury data. For instance, for the country profile, Bangladesh provided injury data from a national survey and not from the government records to offset the underreporting issue.

Almost three quarters of road traffic deaths in the South-East Asia are of vulnerable road users (motorcyclists, pedestrians and cyclists).

Vulnerable road users

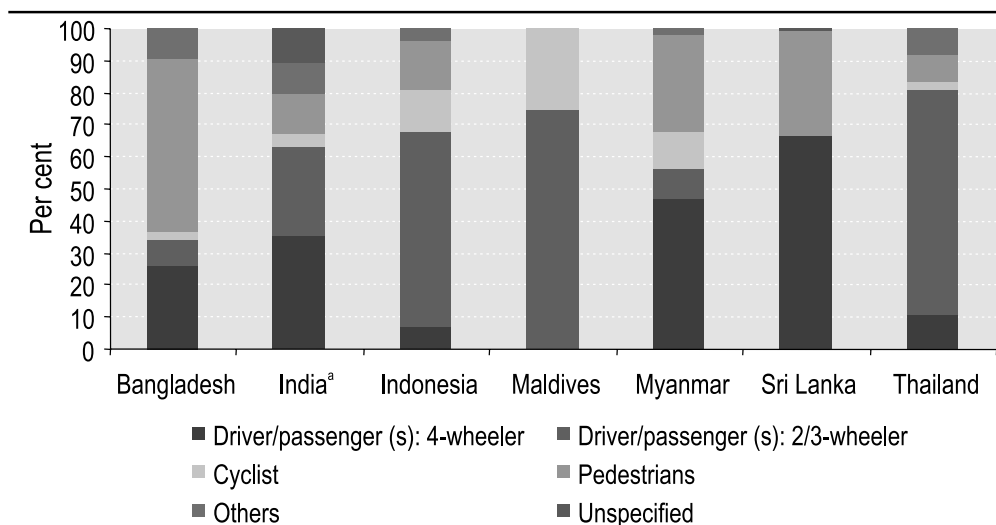
Data from this survey show that in the South-East Asia Region vulnerable road users (pedestrians, motorcyclists and cyclists) make up the highest proportion of reported deaths. However, there is considerable variability among the various participating countries. For instance, over 89% of those killed on the roads in Indonesia are vulnerable road users while the corresponding figures for Thailand and Myanmar are 80% and 51% respectively. In India, Indonesia, Maldives and Thailand, drivers and passengers of motorized two-wheelers account for the bulk of the most vulnerable road users, while pedestrians make up this group in Bangladesh and Myanmar (Figure 5).

Vulnerable road users in the Region are at additional risk as their needs have not been taken into consideration by policy-planners (Box 4). No comparison between countries was made because of differences in source of data. For instance, the data from Bangladesh, India and Myanmar are from the relevant government authority while data from Maldives and Sri Lanka are from the police and in the case of Thailand it is from the national injury surveillance system.

Box 4: Poor road engineering: a major risk factor

Poor road and land-use planning often leads to a deadly mix of high-speed through traffic, heavy commercial vehicles, motorized two-wheelers, pedestrians and bicyclists on developing-country roads. Accommodation for vulnerable road users, such as sidewalks and bicycle lanes, are rare.

Figure 5: Road traffic deaths in seven countries of the South-East Asia Region, classified by road user group, 2007*



(Source: Government approved data from the participating countries.)

* Except Bangladesh (2006), Bhutan (mid 2006-mid 2007) and India (2006). Indian data for 2007 is available.

^a Total proportion furnished was less than 100%. Since this is official data 10.8% of “unspecified” was added so that the figures totalled 100%.

Data on economic cost

This analysis was done to determine the economic burden incurred by road traffic injuries and deaths in the Region. Most of the people killed on the roads are young and aged between 15 and 44 years, which corresponds to the most economically productive segment of the population. Hence, road traffic injuries pose a huge economic burden on countries in the Region. Seven out of ten participating countries have at least one study on the cost of road traffic injuries. Gross output methodology⁵

⁵ Gross output is an economic concept used in *national accounts* such as the *United Nations System of National Accounts (UNSNA)* and the *US National Income and Product Accounts (NIPA)*. It is equal to the

value of net output or *GDP* (also known as *gross value added*) plus *intermediate consumption*. Thailand followed the human capital method⁶ to analyse the cost of road traffic injuries (*Table A.3 in the Statistical Annex*). However, this study did not attempt to quantify the economic impact of road traffic injuries on families which is also an important issue in the SE Asia Region.

value of net output or *GDP* (also known as *gross value added*) plus *intermediate consumption*.

⁶ Human capital/lost wages method is based on neoclassical economic theory. Lost product is the value of the wages (measured as average earnings) plus other inputs to production (capital, plant and equipment, land, enterprise, etc) multiplied by the number of work days missed. For reduced productivity while working, a percentage of this calculation is used.

Box 5: The impact of road traffic crashes on the poor in Bangalore, India

A study undertaken by the Transport Research Laboratory commissioned by the GRSP (Global Road Safety Partnership) focused on the involvement and impact of road crashes on the poor, in comparison to the non-poor, in both urban and rural areas in Bangalore, India. Defining poverty was not straightforward—the study relied on official definitions and consequently the poor were defined on the basis of post-crash income—due to the difficulty in identifying household income in the five years preceding the survey.

The study revealed that the poor were not found to be consistently at greater risk of road traffic death and serious injury: Only in the rural areas of Bangalore did poverty correlate with a higher death rate. However, what the study did reveal was that many households which were not poor before the road traffic injury were pushed into poverty after a crash because of loss of contribution to the household from the injured person. In Bangalore, the majority of households reported at least one person having to give up work or study to care for the injured. The injured poor also had a lesser degree of job security and fewer were able to return to their previous jobs.

Registered vehicles

Huge growth of motorized vehicles especially motorcycles in the region has been observed during last few years. From the survey it was evident that motorized two- and three-wheeled vehicles

constituted more than 60% of the registered vehicles in all participating countries of the Region except Bhutan (Table 3). Bhutan has highest proportion of motor cars in the Region: about 55% of all registered vehicles in the country.

In India, Indonesia, Maldives, Nepal, Thailand and Timor-Leste, almost 70% of all registered vehicles are motorized two- or three-wheelers. However, in Bhutan more than half are motor cars

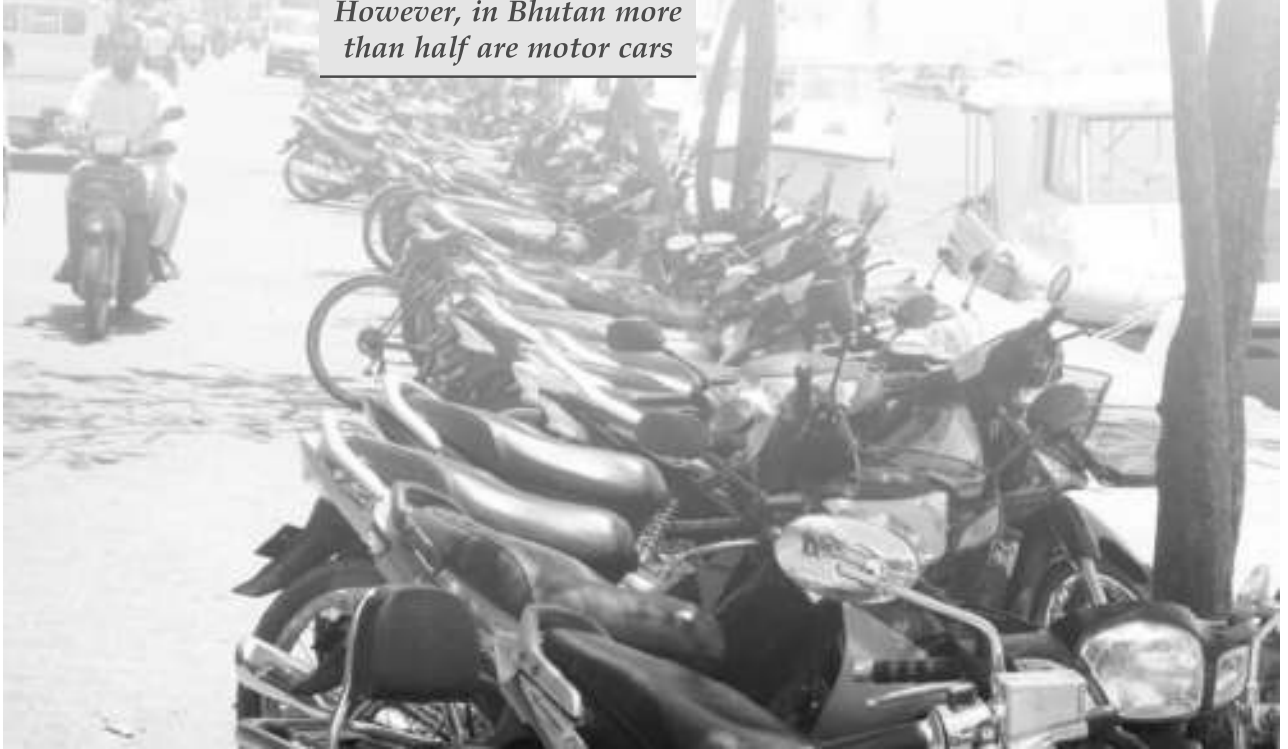


Table 3: Proportion of registered vehicles (%) in 10 countries of the South-East Asia Region, most recent year reported between 2004 and 2008

Country	Motor cars	Motorized two- or three-wheelers	Minibus	Trucks	Buses	Others	Reporting year
Bangladesh	15.2	62.2	9.8	5.9	3.3	3.6	2007
Bhutan	55.1	20.9	1.5	12.6	0.5	9.4	2007
India	11.2	71.4	4.8	3.3	1.0	8.3	2004
Indonesia	15.0	73.0	0.0	8.0	4.0	0.0	2007
Maldives	8.1	79.2	7.2	0.8	0.2	4.5	2007
Myanmar	26.0	64.6	2.3	3.2	1.8	2.1	2008
Nepal	14.3	69.2	1.5	5.4	2.7	6.9 ^a	2007
Sri Lanka	11.6	62.9	6.2	7.7	2.6	9.0	2007
Thailand	14.2	63.0	18.6	2.9	0.5	0.8	2007
Timor-Leste	6.00	72.1	13.8	7.9	0.2	0.0	2008

(Source: Government approved data from the participating countries)

^a Nepal has 6 per cent registered non-motorized vehicles.

Box 6: Involvement of motorcycles in road traffic accidents: An emerging issue in South-East Asia

A feasibility study for prospective road traffic injury surveillance in Bangalore and Pune in India was conducted by the Indian Council of Medical Research in 2006-2007. The data reveal that two-wheeler riders were the most frequently injured, accounting for 30% of all road traffic victims.

Data from the Indonesian police department shows that 44% of all vehicles involved in road traffic accidents in 2001 were motorcycles. This gradually increased to more than 68% in 2007.

A situation analysis was conducted to strengthen and establish the injury surveillance system in two districts of Nepal in 2008. Motorcycles comprised 43% of all vehicles involved in road traffic accidents.

In Sri Lanka, after establishing the national injury surveillance system in 2006, an analysis of data of the first three months shows that more than half (51%) of vehicles involved in road traffic accidents were motorcycles.

In Thailand, an analysis of injury surveillance data of the first six months of 1995 clearly showed that motorcycle accidents were the most important cause of transport injuries and deaths. Motorcycle driver and passenger deaths comprised 66%-72% of all deaths due to transport accidents for that period.



Safety law exists but the level of implementation is suboptimal

Speed

What is known:

- The speed of the vehicle is an important determinant of injury; the faster the vehicle is travelling, the greater the energy inflicted on the occupants during a crash and the greater the injury.
- Research on effective speed management indicates that the speed limits on urban roads should not exceed 50 km/h. However, it is imperative to give the local or provincial decision-makers the authority to reduce national-level speed limits as required. For example, speed limits in residential areas or near schools or roadside markets should be brought down.
- An increase of 1 km/h in mean traffic speed results in a 3% increase in the incidence of injury crashes and a 4%-5% increase in fatal crashes(10).
- A 5% increase in average speed leads to an approximately 10% increase in crashes that cause injuries, and a 20% increase in fatal crashes. Pedestrians have a 90% chance of survival when struck by a car travelling at 30 km/h or below but less than 50% chance of surviving an impact at 45 km/h. Pedestrians have almost no chance of surviving an impact at 80 km/h(11).
- Passengers in a car with an impact speed of 80 km/h are 20 times more likely to die than at an impact speed of 32 km/h(12).
- If a car suddenly stops when travelling at 50 km/h, the human body becomes like a pinball—bouncing off the inside of the car. The car can also collide with people in the car who are wearing their safety belt, severely injuring them.

- Enforcement of set speed limits through radar guns and police presence has lowered crash deaths by 14% and injuries by 6%(13).
- The well-publicized use of speed cameras has also been shown to reduce crashes substantially(14,15).

What this survey found:

All participating countries except India have speed limit legislation for cars at a national level (Table 4). India has only state-level legislation on speed limits that may be modified by local authorities⁷. However, national speed

limits for urban roads is set at 50 km/h or less in all other Member countries except Indonesia and Thailand. Local authorities in Indonesia, Myanmar and Thailand have the authority to modify national speed limits.

Hence, only 10% of participating countries have speed limits of 50 km/h or below on urban roads and they allow local authorities to modify national speed limits. It was also observed that speed limits for urban and rural roads are different in all participating countries and this limit varied according to vehicle type.

No country in the Region rated the degree of enforcement of speed limit laws at higher than 5 on a scale of 0 to 10 (Table 4). This suggests that enforcement is frequently found lacking in the Region.

⁷ Due to the structure of the questionnaire, India was not required to supply information regarding state-level speed limits.

Table 4: National speed limits (km/h) for vehicles and enforcement levels in nine countries of the South-East Asia Region, 2008

Country	Urban (km/h)	Rural (km/h)	Inter-city/ highways (km/h)	Law enforcement on a scale of 0 to 10 (as per consensus of the respondents)
Bangladesh	25	40	60	0
Bhutan	30	50	50	3
India ^a	–	–	–	4
Indonesia	70	100	100	3
Maldives	30	30	60	5
Myanmar	40	40	80	5
Nepal	40	–	–	5
Sri Lanka	50	70	–	5
Thailand	80	90	120	2
Timor-Leste	50	90	120	0

(Source: Government approved data from the participating countries.)

^a India does not have a national speed limit. However, there are state-level speed limits.

– No data available.

What needs to be done?

- Reset the national as well as local/provincial speed limits keeping in mind road infrastructure and vulnerable road-users.
- Speed enforcement detection devices, especially speed cameras, can be put in place where required.
- Local or provincial administrations need to be given the authority, resources and political support to modify the national speed limits where vulnerable road users are particularly at risk.
- Behaviour change communication programme can be implemented to raise public acceptance levels on enforcing speed limits.

Alcohol

What is known:

- Crash risk at a blood alcohol concentration (BAC) of 0.05 g/dl is 1.83 times greater than at zero BAC⁽¹⁶⁾.
- Laws which establish lower BACs (between zero and 0.02g/dl) for young/novice drivers can lead to reductions of between 4% and 24% in the number of crashes involving young people⁽¹⁷⁾.

- Sobriety checkpoints and random breath-testing have been found to lower alcohol-related crashes by about 20%⁽¹⁸⁾ and an effective way to deter drunk driving is to raise drivers' perceived risk of getting caught⁽¹⁹⁾.

What this survey found:

All participating countries in the Region except Indonesia and Maldives have legislation on drinking and driving. However, standard methods for defining drink-driving have not been stipulated in Bangladesh and Nepal. Only three countries have a drink-and-drive law that uses a BAC limit of less than or equal to 0.05g/dl, as recommended by the *World Report on Road Traffic Injury Prevention*. Among the participating countries the maximum BACs are different (*Table 5*). Although young or novice drivers are at a much increased risk of having a road traffic crash when under the influence of alcohol, there is no special BAC limit for them in any country. Thailand is the only country in the Region to have data on the alcohol-relatedness of road traffic deaths, estimated to be 34.8% in 2007⁸.

⁸ Based on sentinel surveillance; includes deaths in hospitals only. The original figure (4%) submitted to the study and published in the *Global Status Report on Road Safety*. Officially the Thai government has requested that the figure be changed instead.



Box 7: Alcohol and road traffic injuries: Experiences from South-East Asia

Alcohol impairs judgement and increases the possibility of involvement in other high-risk behaviours (e.g. speeding, violating traffic rules, etc.). It also affects vision and poses difficulties in identifying risks and perceiving dangerous situations in the road environment. Several studies conducted in India, Nepal and Sri Lanka showed that a significant number of road traffic injuries are contributed by alcohol.

In Sri Lanka, the number of people riding vehicles under the influence of alcohol increased from 1494 in 1984 to 5667 in 1999. Information from the police also indicated that more than 10% of drivers were under the influence of alcohol. It was also observed from a study that 12% of all patients admitted to the emergency departments of hospitals following road traffic injuries had been under the influence of alcohol.

Jha *et al.* in a hospital-based study in Nepal found that most of the road traffic injuries occurred during weekends and nearly 17% of these accidents occurred because the driver was under the influence of alcohol.

A hospital-based study conducted in casualty departments in India revealed that 7% of road traffic injury patients had consumed alcohol. Another study also found that 29% of two-wheeler victims had been under the influence of alcohol.

Source: Gururaj G. Alcohol and road traffic injuries in South Asia: Challenges for prevention. *Journal of College of Physician and Surgeon Pakistan*, 2004; 14(12): 713-718

Table 5: Blood alcohol concentration (g/dl) stipulated in 10 countries of the South-East Asia Region, 2008

Country	General population	Young/novice drivers	Professional/commercial drivers
Bangladesh ^a	–	–	–
Bhutan	0.08	–	–
India	0.03	–	–
Indonesia ^b	–	–	–
Maldives ^b	–	–	–
Myanmar	0.07	–	–
Nepal ^a	–	–	–
Sri Lanka	0.08	0.08	0.08
Thailand	0.05	0.05	0.05
Timor-Leste	0.05	0.05	0.05

(Source: Government approved data from the participating countries.)

^aDrink-driving law exists but no standard definition or no national blood alcohol concentration limit.

^bNo drink-driving law.

– No data available.



Table 6: Mechanisms for enforcing drink-driving laws and level of enforcement in the select Member countries of the South-East Asia Region, 2008

Countries	Random Breath-testing	Police check points	Breath-testing of all drivers involved in crashes	Blood testing of all drivers involved in crashes	Law enforcement on a scale of 0 to 10
Bangladesh	No	No	No	No	1
Bhutan	No	No	Yes	Yes	3
India	Yes	Yes	Yes	Yes	3
Myanmar	Yes	No	No	No	5
Nepal	Yes	Yes	Yes	No	6
Sri Lanka	Yes	Yes	No	No	5
Thailand	Yes	Yes	No	No	5
Timor-Leste	Yes	Yes	No	No	0

(Source: Government approved data from the participating countries.)

Random breath-testing and police checkpoints are important enforcement mechanisms that have been shown to reduce alcohol-related crashes. Three quarters of the countries reported that they use one or both of these methods to enforce the law. However, the degree of enforcement appears to be unsatisfactory. Nepal and Sri Lanka rated the enforcement of their drink-driving law at 6 on a scale of 0 to 10 while all other countries rated it at 5 or less (*Table 6*).

What needs to be done?

- All Member States should have and should strictly enforce the law on drink-driving with clear definitions and blood alcohol concentration (BAC) limits set at or below 0.05g/dl.
- Special BAC limit (below 0.02g/dl) should be set for the young or novice drivers in all Member States.
- Behaviour change communication programme can be implemented to raise public awareness levels on the magnitude of drink-driving and the reasons for enforcing the law.

Helmets

What is known:

- Head injury is the major cause of hospital admissions and deaths

among riders of motorized two-wheelers and bicycles(20,21).

- Among motorized two-wheeler riders it has been found that in a crash no-helmets users are three times more likely to sustain head trauma than helmet-users(22).
- Wearing a motorcycle helmet correctly can reduce the risk of death by almost 40% and the risk of severe head injury by over 70%(23).
- When motorcycle helmet laws are enforced effectively, helmet-wearing rates can increase to over 90%(24).
- Mandatory helmet laws reduce head injuries among cyclists by about 25%(13).

What this survey found:

Drivers and passengers (both adult and child) of motorized two-wheelers are required by law to use helmets in all participating countries of the Region except Maldives. This law also applies to all road types and vehicles of all engine sizes. However, four countries have exceptions for religious reasons and Sri Lanka does not enforce the wearing of helmets among children going to school in uniform (*Table 7*). In addition, only six of the participating countries stipulate that helmets need to meet a specific standard. Effectiveness of enforcement of the existing helmet law is satisfactory (greater than or

equal to 6) in several participating countries compared to enforcement levels of other road traffic injury prevention laws (*Table 7*). Taken together these findings reveal that countries in the Region are making

a progress towards implementing the law on wearing helmets. However, the effectiveness of enforcement of helmet laws is quite low in Bangladesh, India, Thailand and Timor-Leste.

Box 8: Mandatory helmet use law reduces head injuries significantly in Thailand

In Thailand, mortality due to traffic injuries began to increase in the late 1980s. According to hospital data, approximately 80% of all road traffic injury victims are motorcyclists and about half had had head injuries. To reduce motorcycle-related deaths, the Act on wearing of helmets for motorcyclists was enacted nationwide in Thailand in December 1994 and was subsequently enforced. Trauma registry data (two years before and after the enforcement of the Helmet Act) at the Khon Kaen Hospital were analysed to evaluate the effectiveness of the law. It was found from the study that after enforcement of the Act, the number of motorists wearing helmets increased five-fold while head injuries decreased by 41.1% and deaths by 20.8%.

Source: Ichikawa M, Chadbunchachai W, Marui E. Effect of the Helmet Act for motorcyclists in Thailand. *Accident Analysis and Prevention*, 2003, 35:183-189.

Table 7: Helmet-wearing laws and enforcement in the South-East Asia Region^a, 2008

Country	Existence of helmet law	Exemptions	Requires helmet standards	Law enforcement on a scale of 0 to 10
Bangladesh	Yes	No	No	3
Bhutan	Yes	No	Yes	9
India	Yes	Religious headgear	Yes	2
Indonesia	Yes	Religious headgear	Yes	7
Maldives	No	n/a	n/a	n/a
Myanmar	Yes	Religious headgear	Yes	6
Nepal	Yes	No	No	9
Sri Lanka	Yes	Schoolchildren in uniform	Yes	7
Thailand	Yes	Religious headgear	Yes	4
Timor-Leste	Yes	No	No	5

(Source: Government approved data from the participating countries.)

^aDPR Korea did not participate in the survey.

n/a: Not applicable.



Indonesia, Myanmar and Thailand have a national estimate on the proportion of helmet use among riders of motorized two-wheelers though the reliability and the generalizability of the results vary considerably. More than 93% of motorized two-wheeler riders use a helmet in Indonesia, 60% in Myanmar and only 27% in Thailand. Although there is no national estimate for Timor-Leste respondents at the consensus meeting agreed that approximately 70% of all motorized two-wheeler drivers in that country used helmets.

What needs to be done?

- All Member States should have law on mandatory helmet use by the driver and passengers of all engine types of motorized two wheelers and enforce strictly to obtain substantial impact in reducing deaths and head injuries.
- Motorcycle helmets should meet a national or international standard and should be available for all population, and especially for children.
- Member States should develop system to collect data to monitor

helmet-wearing rate and use it as a police performance indicators.

Seat-belts and child restraints

What is known:

- Seat-belt use reduces crash death risk by 40%-65%, moderate and severe injuries by 43%-65% and all injuries from 40%-50%(25, 26).
- Wearing a vehicle safety belt reduces the risk of being killed or seriously injured in a road crash by about 40%.
- Use of child restraints has been shown to reduce infant crash deaths by about 71% and the deaths of small children by 54%(27).
- Mandatory child restraint laws and their enforcement lead to an increase in the use of child restraints(28,29).

What this survey found:

While seat-belt laws are widespread in other Regions of WHO only six countries in the South-East Asia Region have formulated national laws on seat-belt use (Table 8). In three of these countries (Bhutan, India and Timor-Leste) the law is applied to both front- and rear-seat occupants while in the other three countries the law is only applicable

to front-seat occupants. Indonesia has the highest rating of seat-belt law enforcement (7 on a scale of 0 to 10) in the Region. Other countries have a law enforcement rating of 5 or less on the said scale.

According to the behavioural risk factors surveillance system of the Bureau of Noncommunicable Diseases, Ministry of Public Health, Thailand, 56.4% of all front-seat occupants use seat-belts. Although there is no national data on the proportion of seat-belt users in Indonesia, a survey in Jakarta showed that 85% of all car occupants use seat-belts. During the consensus meeting in Timor-Leste it was estimated that about 5%-10% of front-seat occupants use seat-belts. In other countries there was no data on the proportion of seat-belt users among motorists at a national level.

Seat-belt laws cannot be effective if large numbers of cars are not fitted with seat-belts. Among the car manufacturing countries in the Region, Indonesia has seat-belt installation standards for both seats. However, India and Thailand have seat-belt installation standards applicable only for the front seats.

Use of child restraints is mandatory in Timor-Leste as per government decree (Decree law No. 06/2003, Section 55). In other Member countries, there is no law on the use of child restraints.

Table 8: Seat-belt and child restraint laws in the South-East Asia Region^a, 2008

Country	Seat-belt law exists	Applies to all occupants	Law enforcement on a scale of 0-10	Child-restraint law exists
Bangladesh	No	n/a	n/a	No
Bhutan	Yes	Yes	4	No
India	Yes	Yes	2	No
Indonesia	Yes	No	7	No
Maldives	No	n/a	n/a	No
Myanmar	No	n/a	n/a	Don't know
Nepal	Yes	No	4	No
Sri Lanka	No	n/a	n/a	No
Thailand	Yes	No	5	No
Timor-Leste	Yes	Yes	0	Yes

(Source: Government approved data from the participating countries.)

^aDPR Korea did not participate in the survey.



What needs to be done?

- Car manufacturing countries in the Region should have seat-belt installation standards for both front and rear seats of all vehicles.
- All countries should enact laws that require car occupants of both front and rear seats to use seat-belts.
- Strengthening the enforcement of the law for occupants of both front and rear seats of cars.
- All Member countries should pass child restraint laws specifying the type of restraint, the child's age for which each restraint is appropriate, and the seating position.
- Improve access to affordable child restraints.
- Countries need to establish systems to collect data on rates of use of seat-belts and child restraints.
- Enforcement efforts must be supplemented by raising public awareness on wearing a seat-belt and using child restraints through mass media campaigns.

Synopsis of legislative issues

While positive steps towards the enacting of appropriate legislation have been taken in most participating

countries, much remains to be done. Governments need to enact and enforce comprehensive laws that will save thousands of lives from road traffic injuries.

All participating countries reported at least one law related to the five major risk factors (speed, drink-driving, helmets, seat-belts and child restraints) at the national or sub-national level, although these are not entirely comprehensive in scope. Only Timor-Leste has national laws relating to all risk factors while Bhutan, India, Nepal and Thailand have laws on four major risk factors (with the exception of the use of child restraints). Laws need to ensure that legal loopholes that could exempt particular groups of road-users are plugged. Existing laws also appear to be inadequately enforced in most countries.

Enforcement efforts must be highly visible, well-publicized, sustained, and implemented by appropriate measures and with accompanying penalties for infringement. Effective enforcement of these laws depends on police performance and public support.

Pre-hospital care system

Many road traffic deaths may be prevented or their severity reduced by adequate pre-hospital trauma care. However, pre-hospital care is virtually non-existent in most countries of the



South-East Asia Region. The major benefits of pre-hospital care are realized when the timely provision of care can limit or halt the cascade of events that otherwise lead quickly to death or lifelong disability. Mortality is related to at least four major variables: severity of the injury, host factors, quality of care, and elapsed time before definitive treatment. Pre-hospital trauma care could influence the survival rate of trauma patients by providing first aid at the scene of crash, transferring patients to the appropriate hospital, as well as by reducing transfer time(31).

Table 9: Nationwide universal access phone number in participating countries* for pre-hospital care system, 2008

Country	Formal pre-hospital care system in existence	Nationwide universal access phone number for pre-hospital care	Regional or local access phone numbers for pre-hospital care
Bangladesh	No	–	–
Bhutan	No ^a	112	–
India	Yes	102	–
Indonesia	Yes	118- ambulance 113-fire department 112-police department 1717-police SMS centre	–
Maldives	No	–	–
Myanmar	Yes	No	01500005
Nepal	No ^a	–	–
Sri Lanka	No ^b	No	110
Thailand	Yes	1669	–
Timor-Leste	Yes	110 112	–

(Source: Government approved data from the participating countries.)

* DPR Korea did not participate in the survey.

^aThere is no formal pre-hospital care system in Bhutan but a free ambulance service is available. In Nepal almost all ambulances are free with some exceptions.

^bOnly in some major cities in Sri Lanka but not nationwide.

Data from participating countries revealed that six of them have either a national or regional formal, publicly available pre-hospital care systems (*Table 9*). Although there is no formal pre-hospital care system in Bhutan and Nepal a free ambulance service is available in both countries. Among the countries with pre-hospital care facilities, Myanmar has only a regional-level access phone number for pre-hospital care whereas other Member countries have nationwide universal access phone numbers for pre-hospital care.

All participating countries have the institutional framework for road traffic injury prevention

All participating countries in the South-East Asia Region have a lead agency to address road traffic injuries (*Table 10*). In most of the countries, lead agencies are part of a government ministry, mostly the ministry of road, transport and highways. Inter-ministerial bodies serve as the lead agency in Bangladesh, Myanmar and Thailand while the National Cabinet of Indonesia is the lead agency in that country. In seven countries funding is available for the lead agencies to carry out road-safety activities.

Table 10: Road safety management in the South-East Asia Region*, 2008

Country	A lead agency is present	Has a national strategy	Strategy has measurable targets	Strategy is funded
Bangladesh	Yes (inter-ministerial)	Yes	Yes	No
Bhutan	Yes (within a government ministry)	No	n/a	n/a
India	Yes (within a government ministry)	Yes ^a	n/a	n/a
Indonesia	Yes (National Cabinet)	Multiple strategies	n/a	n/a
Maldives	Yes (within a government ministry)	Yes	Yes	Yes
Myanmar	Yes (Inter-ministerial)	Yes	Yes	Yes
Nepal	Yes (within a government ministry)	Yes ^a	n/a	n/a
Sri Lanka	Yes (within a government ministry)	Yes ^a	n/a	n/a
Thailand	Yes (Inter-ministerial)	Yes	Yes	Yes
Timor-Leste	Yes (within a government ministry)	Multiple strategies	n/a	n/a

(Source: Government approved data from the participating countries.)

*DPR Korea did not participate in the survey.

^aNot formally endorsed by government.

Four countries in the Region have a national strategy for the prevention of road traffic injuries with measurable targets formally endorsed by the government. In these countries, except for Bangladesh, there is funding to carry out activities under the national strategy. While Indonesia and Timor-Leste have multiple strategies, Bhutan has no national strategy. However, seven of the 10 countries surveyed (except India, Nepal and Timor-Leste) have included measurable targets in their national road safety strategy irrespective of government endorsement.

Other measures to reduce exposure and prevent road traffic injuries

Reducing exposure to the risk of injury or death on the road can be

achieved by reducing the volume of traffic on the road as well as behavioural change of the road users. This in turn requires considerable investment in infrastructure that allows pedestrians and cyclists to walk and cycle safely and ensure the availability of affordable and safe public transport. This survey found that India, Indonesia and Myanmar have national or local policies to promote walking and cycling as an alternative to motorized transport. However, Thailand has the same policy at the provincial and municipal level. All these countries have made investments to construct exclusive bicycle lanes and footpaths. The Government of Myanmar runs a special programme to support increased use of bicycles for transport. The governments of India, Indonesia, Myanmar, Sri Lanka and Thailand





have taken initiatives to improve public transport services as a viable alternative to private car transport. Such initiatives are expected to bring about a tangible improvement in road safety standards.

Theoretical and practical assessments for securing a driving license are mandatory in all Member countries in the Region. In addition, medical fitness is compulsory in India while colour blindness and appearance tests are also required to be passed in Myanmar.

Myanmar and Timor-Leste are the only countries in the Region that require formal road safety audits for major new road construction projects. Myanmar is also the only country that reports conducting regular road safety audits of existing infrastructure.

Several other countries in the Region however, conduct informal road safety audits.

India, Indonesia, Myanmar and Thailand are the car manufacturing countries in the Region. They have in place national legislation on car-manufacturing standards. While India has seat-belt installation standards (applicable for the front seats), Myanmar has only fuel consumption standards. Indonesia has both fuel consumption and seat-belt installation (all seats) standards. Thailand has seat-belt installation standard applicable for the front seats only.

This survey also revealed that motorized vehicle insurance is mandatory in all participating countries except Maldives, which protects the rights of the victims.

A list of existing road safety measures which are being practised in the participating countries is enclosed in the Statistical Annex (Table 11).

Table 11: Different road safety measures to reduce exposure and prevent injuries in the South-East Asia Region*, 2008

	Policies		Audits		Driving test			Insurance
	There are policies to promote walking and cycling	There are policies to promote investment in public transportation	Formal audits on new roads	Regular audits on existing roads	Written	Practical	Medical	Compulsory insurance
Bangladesh	No	No	No	No	Yes	Yes	...	Yes
Bhutan	No	No	No	No	Yes	Yes	...	Yes
India	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Indonesia	Yes	Yes	No	No	Yes	Yes	...	Yes
Maldives	No	No	No	No	Yes	Yes	...	No
Myanmar	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nepal	No	No	No	No	Yes	Yes	...	Yes
Sri Lanka	No	Yes	No	No	Yes	Yes	...	Yes
Thailand	Sub-national	Yes	No	No	Yes	Yes	...	Yes
Timor-Leste	No	No	Yes	No	Yes	Yes	...	Yes

(Source: Government approved data from the participating countries.)

*DPR Korea did not participate in the survey.a Not formally endorsed by government.

Conclusions and recommendations

4

The previous chapter has discussed in detail the magnitude of road traffic injuries and the existing legislation related to the major key risk factors (speed, drink-driving, helmets, seat-belts and child restraints) as well as the rate of implementation of these laws in Member States of the WHO South-East Asia Region. Furthermore, government initiative towards reducing road traffic injuries, including the promotion of use of alternative transport, was also highlighted.

This chapter brings together the major and outstanding findings, and the strengths and weaknesses of this survey. The chapter concludes by presenting a set of feasible options or suggestions that governments and others involved in the field of road traffic injury prevention should consider to develop national or local strategic guidelines to address the problem.

This survey has provided the first comprehensive assessment of road safety status in the South-East Asia Region. The methodology of

the survey was designed to bring multisectoral road safety practitioners on to the same platform with the aim of fostering collaborative efforts at the national level. However, as with any study, there are a number of limitations, namely:

- Information collected for this survey was based on self-administered questionnaires, which is subject to potential biases. Furthermore, a degree of subjectivity was introduced as respondents were asked to rate enforcement of the legislations on risk factors in their country according to their perception.
- Cross-country comparisons for some indicators couldn't be made due to:
 - unavailability of data related to the magnitude of the problem. For instance, Bhutan and Maldives have no national data on road traffic deaths classified by type of road-users;

- unavailability of data on legislation related to major risk factors (e.g. Indonesia and Maldives have no data on drink-driving);
 - different interpretations of terms used in the questionnaire (e.g. what constitutes a rural road or a highway may differ between countries);
 - data representing the period are different (2003-2008);
 - there are different sources of data for the same variables (e.g. data on deaths in some countries came from the police sector and in others from the health sector. In the case of Bangladesh the national survey was the source of injury data whereas other countries provided the same data from either the health sector or the police); and,
 - unavailability of data related to monitoring and evaluation indicators such as rate of seat-belt use and the use of helmets and child restraints.
- The survey focused on national-level data, but in a few participating countries legislation related to major key risk factors are enforced at the sub-national or local level (e.g. in India each state has its own law on speed limit). Besides, local authorities are entitled to modify national-level legislation. This survey did not record these sub-national or local data.
 - Most of the countries in the Region do not manufacture motor cars but import them. However, this survey did not collect any information on seat-belt requirements for imported cars.
- Despite its limitations, this survey has generated information that could be useful for policy guidance in addressing road traffic injuries at the national as well as regional level.
- The results of this survey can serve as an information base for policy-makers on the magnitude of road traffic injuries as well as existing road safety practices in Member States of the Region for the purposes of setting priorities. This survey may also be a supplementary source of information along with other international and national studies and programmes; for example, implementation and evaluation of the good practice manuals developed through the United Nations Road Safety Collaboration.
- The response to road traffic injuries cannot and should not be different from other public health responses. Enhancing public health

response to include road traffic injuries requires obtaining commitment from professionals concerned. The momentum of response to road traffic injuries as a regional crisis needs serious attention, and we must search for more effective strategies to end the pandemic of road traffic injuries across the Region. The commitment from the political leadership in countries, and from policy-makers in WHO, the World Bank, United Nations and the international community has provided a platform on which we can work together.

This survey, however, shows that much more remains to be done. No country can afford to be complacent and assume that its road safety work is complete. The international community must continue to recognize road traffic injuries as an important health and development issue and intensify support for their prevention. The action brooks no delay as every hour is witness to the continuing scourge of deaths, injuries and disabilities on the road.

Main messages from the Report

This survey, the first report on road safety status in the WHO South-East Asia Region, presents the magnitude of road traffic injuries; status of institutions, policies, legislation, data collection systems; and perceived levels of enforcement of legislation

at country level. The following are the main messages of the Report:

- Few countries in the Region have a national road safety strategy in place with measurable indicators formally endorsed by the government as well as with a special budgetary allocation for carrying out its mandated activities.
- National-level data on road traffic deaths and injuries are routinely collected in all participating countries by government authorities. However, variations have been observed among the countries defining “death”.
- Road traffic deaths remain a major public health problem and approximately 285 020 people had died on the roads of countries of the South-East Asia Region in 2007. Maldives, Myanmar and Thailand have highest death rates. Pedestrians, cyclists and users of motorized two- or three-wheelers (the vulnerable road-users) together account for more than half of all road traffic deaths in the Region. The high proportion of motorcycles may have a conspicuous association in this context.
- Police data are mostly underreported and the police departments were the main source of road traffic injury data in the Region. Hence,

underreporting is a crucial issue. Reported data on road traffic deaths and injuries were found to be grossly underreported as per previous global estimation.

- Most of the countries in the Region have legislation on key risk factors (e.g. speed, drink-driving, helmets, seatbelts and child restraints) with some flexibility to certain laws. However, implementation of these laws at the national level is suboptimal in many countries.
- Four of the participating countries have nationwide formal pre-hospital care systems.

Recommended actions

It is the responsibility of the governments to make road safety a political priority, set road safety targets, develop multidisciplinary approaches to road safety, set and enforce strong and uniform vehicle safety standards, and enforce safety laws already in existence. The findings of this survey suggest that while most countries have taken tangible steps towards addressing road safety, additional efforts are needed. Hence, governments and others involved in road safety activity are encouraged to consider the following recommendations for addressing the problem:

1. Strengthen lead agencies and develop strategic guidelines for road traffic injury prevention with specific measurable targets

Few countries in the Region have institutional frameworks with funding to carry out road safety activities. Thus, the critical first step is to revitalize or strengthen lead agencies to move forward and closely monitor road safety activities. Since road traffic injury is a multifaceted and multidimensional event, a multidisciplinary body led by the appropriate ministry needs to be established to guide-supervise-develop-coordinate-monitor all activities to address the problem.

Evidence suggests that the development and endorsement of a national strategy with realistic targets and earmarked funding for implementation are important factors towards meeting long-term road safety goals. Governments must assess the road safety problem in their country and prepare a national strategy that incorporates those steps that are most likely to have an impact on road traffic injuries. National strategic plans should outline various short-, medium- and long-term programmes with clearly achievable targets addressing all three phases of road traffic injuries: prevention, and post-crash and long-term care. Plans should also outline efforts required from different sectors and the desired coordination mechanisms

along with resource allocation at various levels.

2. Develop and implement specific actions to prevent road traffic injuries

Specific actions to prevent, control and minimize the consequences of road traffic injuries should be based on sound evidence and analysis of existing information on epidemiology of injuries, culturally sensitive and tested locally, and form part of the national strategy. The result of this survey can serve as an insight for policy-planners to develop specific interventions to address the problem considering the "vulnerable road-users". There are several good practices that all countries can follow, including:

- Strengthening lead agencies with the authority, status and resources to guide, develop, coordinate, implement and evaluate road safety issues, policies and programmes;
- Developing strategic guidelines for road traffic injury prevention with specific measurable targets; and,
- Developing and implementing specific actions to prevent road traffic injuries, such as:
 - Speed control on all arterial roads, urban and intercity areas and national highways;

traffic calming in all urban roads and on highways outside the urban areas; and speed limits on urban roads <50 km/h.

- Strict enforcement of mandatory helmet laws for two-wheeler riders (both drivers and pillion-riders);
- Enforcement of drink-driving law (maximum BAC should be 0.05 g/dl for adult drivers and less than 0.02 g/dl for young/novice drivers.
- Enforcement of seat-belt use and use of child restraints;
- Enhanced enforcement of all road safety laws. Enforcement efforts must be well-publicized, sustained, and implemented through the use of appropriate measures and penalties for infringement;
- Mandatory formal road safety audits for all proposed road construction projects and for existing road infrastructure;
- Separation of traffic into slow- and fast-moving vehicles on all possible roads with the provision for safe travel of pedestrians, bicycles, motorcycles and buses.
- Setting safety standards for vehicles, especially motorcycles;

The segregation of different types of road-users is a key step for improving safety. Crashes will be reduced if we keep pedestrians and cyclists off the motorways, create bicycle lanes, provide sidewalks and erect safety barriers between pedestrian zones and the roadway

- Establishing pre-hospital trauma care systems with nationwide universal access phone numbers;
- Modification of products, especially the standardization of helmets for adults and children; and,
- Life skills development and behaviour change, etc.

Encouraging safe behaviour among road-users is important but is not enough to eradicate or stop the road traffic injury epidemic. Programmes to teach people to look both ways before crossing the street will prevent a limited number of injuries, but if we provide sidewalks and speed bumps, mandate safer vehicle fronts and enforce speed limits, many lives will be saved from death or lifelong disability

3. Reinforce injury information system

Valid and reliable data on the magnitude of the problem and associated factors are essential to develop feasible interventions for road safety. Only few countries in the Region have injury information systems to identify vulnerable road-users. It is crucial to improve injury information and surveillance systems. Hence the appropriate use of data from combined sources (police, hospital, surveys, etc.) is recommended.

4. Human resource development and resource allocation

Well-targeted investment of financial and human resources can considerably reduce the toll of injuries and deaths. One of the major hindrances in preventing injuries, especially road traffic injuries, is the lack of experts in the Region. Hence, human resource development and capacity-building across the sectors of police, transport, law and health should receive immediate attention.



Each day's delay means paying a dreadful toll in lives and futures



References:

1. World Health Organization. *The global burden of disease: 2004 update*. Geneva: WHO, 2008. (http://whqlibdoc.who.int/publications/2008/9789241563710_eng.pdf - accessed 01 October 2009).
2. World Health Organization. *Global status report on road safety: time for action*. Geneva: WHO, 2009. (http://whqlibdoc.who.int/publications/2009/9789241563840_eng.pdf (File size: 4.88 MB) - accessed 01 October 2009).
3. World Health Organization. *World health statistics 2008*. Geneva: WHO, 2008. (http://whqlibdoc.who.int/publications/2008/9789241563598_eng.pdf - accessed 01 October 2009).
4. Ghaffar A., Hyder A.A., Veloshnee G., David B. Road crashes: a modern plague on South Asia's poor. *Journal of the College of Physicians and Surgeons Pakistan*. 2004 Dec; 14(12):739-41.
5. Sharma G., Upadhyay M., Sawat Ramaboot. The challenge of road traffic injury in South-East Asia: moving beyond rhetoric. *Regional Health Forum WHO South-East Asia Region*. 2004; 8(1): 1-5. (<http://www.searo.who.int/en/Section1243/Section1310/Section1343/Section1344/Section1836/Section1837.htm> - accessed 01 October 2009).
6. Jacobs G., Aeron-Thomas A., Astrop A. *Estimating global road fatalities*. Crowthorne, Berkshire: Transport Research Laboratory, 2000. TRL Report 445. http://www.esafetysupport.org/download/eSafety_Activities/Related_Studies_and_Reports/Estimating%20Global%20Road%20Fatalities%20report,%20TRL.pdf - accessed 01 October 2009).
7. Peden M., Scurfield, Sleet D., Mohan D., Hyder A.A., Jarawan E., Mathers C. *World report on road traffic injury prevention*. Geneva: World Health Organization, 2004. (<http://whqlibdoc.who.int/publications/2004/9241562609.pdf> - 01 October 2009).
8. Verma, P.K., Tewari K.N. Epidemiology of road traffic injuries in Delhi: result of a survey. *Regional Health Forum WHO South-East Asia Region*. 2004; 8 (1): 6-14.
9. Wang Z. Some aspects of road traffic injuries. *World Journal of Surgery*. 2005; 29: S105-S7. (<http://www.springerlink.com/content/p538881620331w58/fulltext.pdf> - 01 October 2009).
10. Finch D.J. et al. *Speed, speed limits and accidents*. Crowthorne: Transport Research Laboratory, 1994. Project Report 58.
11. Transport Research Centre. *Speed management report*. Paris: OECD Publishing, 2006.
12. *IHS facts: 55 speed limit*. Arlington: VA, Insurance Institute for Highway Safety, 1987.
13. Elvik, R. Vaa T. *Handbook of road safety measures*. Amsterdam: Elsevier Science, 2004.
14. Organisation for Economic Cooperation and Development. *Road safety: impact of new technologies*. Paris: OECD, 2003.

15. Keall M.D., Povey L.J., Frith W.J. The relative effectiveness of a hidden versus a visible speed camera programme. *Accident Analysis and Prevention*. 2001 Mar; 33(2): 277-84.
16. McLean A.J., Holubowycz O.T. Alcohol and the risk of accident involvement. In: Goldberg L., ed. *Alcohol, drugs and traffic safety. Proceedings of the 8th International Conference on Alcohol, Drugs and Traffic Safety, Stockholm, 15–19 June 1980*. Stockholm, Almqvist & Wiksell International, 1981:113–123.
17. Shults R. et al. Review of evidence regarding interventions to reduce alcohol-impaired driving. *American Journal of Preventive Medicine*. 2001, 21(4S): 66–84.
18. Elder R.W. et al. Effectiveness of sobriety checkpoints for reducing alcohol-involved crashes. *Traffic Injury Prevention*. 2002, 3: 266-274.
19. Sweedler B.M. Strategies for dealing with the persistent drinking driver. In: *Proceedings of the 13th International Conference on Alcohol, Drugs and Traffic Safety, Adelaide, 13-18 August 1995*. Adelaide, University of Adelaide, Road Accident Research Unit, 1995 (<http://casr.adelaide.edu.au/T95/paper/s1p3.html> - accessed 01 October 2009).
20. Servadei F., Begliomini C., Gardini E., Giustini M., Taggi F., Kraus J. Effect of Italy's motorcycle helmet law on traumatic brain injuries. *Injury Prevention*, 2003 September, 9: 257-260. (<http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=1731012&blobtype=pdf> - accessed 01 October 2009).
21. Nixon J., Clacher R., Pearn., Corcoran A. Bicycle accidents in childhood. *British Medical Journal*. 1987, May 16; 294(6582): 1267–1269.
22. Kulanthayan S., Radin Umar R.S., Ahmad Hariza H., Mohd Nasir M.T., Harwant, S. Compliance of proper safety helmet usage in motorcyclists. *Medical Journal of Malaysia*, 2000, 55: 40-44.
23. Liu B. et al. Helmets for preventing injury in motorcycle riders. *The Cochrane Database of Systematic Reviews*, 2005, issue 4.
24. Kraus J.F., Peek C., Williams A. Compliance with the 1992 California motorcycle helmet-use law. *American Journal of Public Health*, 1995 January, 85:96–98.
25. European Transport Safety Council. *Seat-belts and child restraints: increasing use and optimising performance*. Brussels: ETSC, 1996.
26. Cummings P., McKnight B., Rivara F.P., Grossman D.C. Association of driver air bags with driver fatality: a matched cohort study. *BMJ*. 2002 May 11; 324(7346): 1119-22.
27. National Highway Traffic Safety Administration. *Traffic safety facts 2002: children*. Washington, DC: U.S. Department of Transportation, 2004; publication no. DOT-HS-809-607.
28. *Motor vehicle occupant protection facts 2006*. Washington, DC.: National Highway Traffic Safety Administration, 2008 (<http://www.nhtsa.gov/staticfiles/ DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/810654.pdf>, accessed on 30 May 2009).
29. Zaza S., Sleet D.A., Thompson R.S., Sosin D.M., Bolen J.C.; Task Force on Community Preventive Services. Reviews of evidence regarding interventions to increase use of child safety seats. *American Journal of Preventive Medicine*. 2001, 21: 4(Supplement 1): 31-47.
30. Vles W.J., Steyerberg E.W., Meeuwis J.D., Leenen L.P. Pre-hospital trauma care: a proposal for more efficient evaluation. *Injury*. 2004 Aug; 35(8): 725-33

Explanatory notes for Statistical Annex

Background

The data presented in the following pages were obtained through a self-administered questionnaire implemented in the 10 participating countries of the WHO South-East Asia Region. The survey focused on the recommendations of the World Report on Road Traffic Injury Prevention(1) as the basis for its structure and content.

Most countries used the same methodology for data collection, as outlined in a survey protocol developed for the study. The survey was coordinated by a National Data Coordinator (NDC) identified by the country, and was completed by teams of 6-8 key respondents including the NDC. The NDCs were trained in the methodology and coordinated the collection, validation and clearance of data, as well as the data entry in the countries concerned. More details on the methodology used for data collection can be found at www.who.int/violence_injury_prevention/road_safety_status/2009.

Data processing

The data processing involved completion of the survey instrument

and data entry at a country level, and validation at a regional level. Data cleaning, analysis and report-writing were done at WHO headquarters in Geneva.

Reporting of country-level data

The final country responses were entered by NDCs into an online database specially prepared by WHO for this project. NDCs also uploaded supporting documents wherever applicable and available. Data were then validated at a regional level. Once finalized and approved by Regional Data Coordinators (RDCs), the data were then exported into Microsoft Excel for cleaning. At this stage, each country's data were examined for accuracy, consistency and validity on a question-by-question basis. Where necessary, NDCs were contacted and additional supporting documents were requested to clarify inconsistencies. A copy of the survey instrument and study protocol can be found at www.who.int/violence_injury_prevention/road_safety_status/2009

As part of the data cleaning and validation process, exploratory analysis was done using STATA(2).

The same software was used for all analysis and results presented in the earlier sections of this report.

Types of data utilized

Three types of data are used in this report:

- reported data from countries and secondary sources;
- data adjusted for the 30-day definition of a road traffic death in order to facilitate comparability;
- modelled numbers.

Reported data

In addition to the data obtained directly from countries, secondary data sources were used to classify countries into income categories and to generate road safety indicators such as the adjusted road traffic deaths and modelled road traffic death rates (with a 90% confidence interval).

Population and income data from the United Nations Population Division⁽³⁾ and the World Bank⁽⁴⁾ were used for this analysis. Population estimates for 2007 are reported. Where there was no estimate available for a country for that year, published data for the latest year were used. For the modelling process, population estimates corresponding to the year of reporting were used.

The World Bank (Atlas method) gross national income per capita (GNI) for 2007⁽⁵⁾ (or latest available year) was used to categorize countries into different income levels. All countries of the South-East Asia Region were classified as low-income, i.e. US\$935 or less.

Adjusted data

Underreporting has been acknowledged for many years as an important reason behind the difficulty in comparing road traffic crash data between countries. Additionally, the lack of harmonized definitions for road traffic deaths, the use of different data sources, and the quality of the reporting system have also been documented. Consequently a number of mechanisms were employed to address some of these issues in order to make the data more comparable. This survey employed the following two methods:

- the European Conference of Ministers of Transport (ECMT) standardized 30-day road crash fatality factors⁽⁶⁾ to adjust all reported country/area data;
- a model using negative binomial regression.

Modelled data

Developing a model

Before the modelling exercise, simple exploratory analyses were done

to evaluate the distribution of the reported data, to identify potential outliers and to determine the extent of missing data. Decisions as to whether to include these outliers in the analyses, or whether to exclude them were taken at several stages of the analysis. Where appropriate, imputation was done to compensate for missing information.

Completeness of data

Having adjusted the reported data to a 30-day definition to facilitate comparability, the next step in the process was to explore the completeness of the reported death data on the basis of reported vital registration (VR) data. Information on the completeness of VR data was obtained from previous WHO published reports^(7,8) and was updated with the latest information from the WHO mortality database. This information was then used to classify countries into two groups, namely:

- Group 1: Countries with VR completeness greater than or equal to 85% and external causes of death coded to undetermined intent less than 30%;
- Group 2: Countries with VR completeness less than 85% or external causes of death coded to undetermined intent greater than 30%.

All the participating countries in the South-East Asia Region fell into Group 2 and thus modelled data (and 90% confidence intervals) are presented in this report.

Variables used in the model

The following independent variables were used in the model:

- Income (GNI)
- Income level
- Population
- Vehicle density: Number of cars per unit population
- Road density: Total road per land area
- Existence of a helmet law
- National policies to encourage walking and/or cycling
- National policies that support investment in public transportation
- National speed limits on urban roads
- National speed limits on rural roads
- Alcohol consumption
- Strength of health care: Hospital beds per 10 000 population

Estimation method

The third stage used data from Group 1 countries to develop a statistical model to predict road traffic deaths (point estimates) for Group 2

countries including 90% confidence limits. The framework used to predict road traffic mortality was constructed using selected variables (identified through a literature review) which have a direct relationship to the outcome variable (road traffic death). These variables were later grouped into three categories: exposure factors (E_j), risk or preventive factors (R_j), and mitigating factors (M_j). Gross national income (I_j) has an influence on the first two categories.

In this framework, the road traffic mortality outcome (Y_j) is a function of a set of independent variables described as exposure factors (E_j), risk or preventive factors (R_j), mitigating factors (M_j) and gross national income (I_j). This can be expressed as follows: $Y_j = f(R_j, M_j, I_j, E_j)$.

The relationship between the outcome and the independent variables is a nonlinear function. The number of deaths (Y_j) is a non-negative integer count data; thus the

standard approach⁽⁹⁾ to be used is the Poisson regression or another form of regression based on the Poisson. The most commonly used regression model for count data treats the response Y as a Poisson variable. In the Poisson regression model, the mean equals the variance, conditional on explanatory variables. In practice, however, this assumption was not satisfied. For this reason, a negative binomial regression model was chosen where the assumption for the dependent variance and Poisson's particular case of negative binomial model are adequately satisfied.

At the end, a negative binomial regression modelling technique using STATA software⁽²⁾ was used to predict the number of road traffic deaths with the population size as an exposure factor. The full in-depth description of the methodology and formulas for the modelling process are available at the website www.who.int/violence_injury_prevention/road_safety_status/2009

References

1. Peden M. *et al.*, eds. World Report on Road Traffic Injury Prevention. Geneva, World Health Organization, 2004 (http://www.who.int/violence_injury_prevention/publications/road_traffic/world_report/en/index.html, accessed 7 April 2009).
2. STATA – Data analysis and statistical software (<http://www.stata.com>, accessed 14 April 2009).
3. *World Population Prospects: the 2006 Revision*. Highlights. New York, United Nations Population Division, 2007.
4. *World Development Indicators*. Washington, DC, International Bank for Reconstruction and Development/The World Bank, 2007.
5. GNI per capita 2007: Atlas method and PPP. Washington, DC, The World Bank, 2007. (<http://siteresources.worldbank.org/DATASTATISTICS/Resources/GNIPC.pdf>, accessed 9 April 2009).
6. Jacobs G., Thomas A.A., Astrop A. *Estimating global road fatalities* (TRL Report 445). Crowthorne, Transport Research Laboratory, 2000 (http://www.transport-links.org/transport_links/filearea/publications/1_329_TRL445.pdf, accessed 22 January 2008).
7. *The Global Burden of Disease, 2004 update*. Geneva, World Health Organization, 2008 (http://www.who.int/healthinfo/global_burden_disease/2004_report_update/en/index.html, accessed 14 April 2009).
8. Mathers C.D. *et al.* Counting the dead and what they died from: an assessment of the global status of cause of death data. *Bulletin of the World Health Organization*, 2005, 83:171–177.
9. Cameron A.C., Trivedi P.K. Regression analysis of count data. *Econometric Society Monograph*, No. 30. New York, Cambridge University Press, 1998.

Table A.1: Road traffic death rate (per 100 000 populationa) trend in seven countries of the South-East Asia Region, 1995-2007

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Bangladesh	1.3	1.6	2.4	2.4	2.4	2.4	2.2	2.3	2.2	1.8	2.1	1.4	2.4
India	-	-	-	-	-	-	-	7.8	7.7	8.2	8.7	9.2	0.0
Indonesia	-	-	-	7.6	6.3	6.2	6.1	5.8	6.3	5.2	5.3	7.1	7.4
Myanmar	-	-	-	2.8	2.6	2.5	2.6	2.6	2.7	2.9	2.8	2.8	3.3
Nepal	-	-	-	3.4	2.9	3.0	3.5	2.7	3.1	3.0	3.0	3.4	0.0
Sri Lanka	-	-	-	-	-	-	-	-	-	11.4	11.4	11.4	0.0
Thailand	-	-	-	19.9	19.5	19.2	18.5	20.6	21.7	21.1	19.5	19.1	18.7

*Populations of the respective year have been cited from the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2008 Revision*, <http://esa.un.org/unpp>. Actual number of death was considered to calculate rates.

Table A.2: Road traffic injuries in participating countries of the South-East Asia Region, most recent year reported between 2003 and 2008

Country	Population ^a (000)	Number of reported cases	Reporting year	Rate per 100 000 population
Bangladesh	148 281	403 000	2003	271.8
Bhutan	676	724	2007*	107.1
India	1 164 670	452 922	2007	38.9
Indonesia	224 670	66 040	2007	29.4
Myanmar	49 129	12 358	2007	25.2
Nepal	28 287	2 653	2007	9.4
Sri Lanka	19 704	31 688	2006	160.8
Thailand	66 507	973 104	2006	1 463.2
Timor-Leste	1 064	1 686	2007	158.5

*Reporting year of data on road traffic injury for Bhutan is mid 2006-mid 2007.

^aSource: Populations of the respective year have been cited from the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2008 Revision*, <http://esa.un.org/unpp>.

Table A.3: Annual costing of road traffic injuries in the seven countries of the South-East Asia Region, most recent year reported between 1996 and 2007

Country	Method of cost analysis	Costing for	Annual cost		Year
			In local currency	In US\$*	
Bangladesh	Gross-output method	Both injuries and deaths	45 billion Taka	654 069 738	2003
India	Gross-output method	Both injuries and deaths	55,000 crore INR	11 550 187 180	2000
Indonesia	Gross-output method	Only for deaths	41.4 trillion Rupiahs	4 190 284 541	2002
Myanmar	Gross-output method	Both injuries and deaths	9.4 billion Kyat in	1 443 404 720	2003
Nepal	Gross-output method	Both injuries and deaths	771,863,874 NRs	10 130 772	1996
Sri Lanka	Gross-output method	Both injuries and deaths	9.34 billion SLR	81 323 468	2007
Thailand	Human capital method	Both injuries and deaths	282,355 million Baht	8 301 237 100	2007

* Money conversion was done as on 6 August 2009.

Table B.1: List of National Data Coordinators

Country	Name and contact address
Bangladesh	Dr AKM Fazlur Rahman Executive Director, Centre for Injury Prevention and Research, Bangladesh Dhaka
Bhutan	Mrs Karma Doma Disability Prevention & Rehabilitation Programme, NCD Division, Department of Public Health, Ministry of Health
India	Dr Ashok Kumar Deputy Director-General and Director, CBHI Ministry of Health and Family Welfare, Government of India, New Delhi
Indonesia	Dr Yusharmen Director, NCD, Ministry of Health Jakarta
Maldives	Ms Aishath Naaz Assistant Research Officer, Health Information and Research Ministry of Health
Myanmar	Professor Thit Lwin Programme Manager (Injury Prevention), Department of Health, Ministry of Health Yangon
Nepal	Prabha Baral Ministry of Health and Population Ramshahpath, Kathmandu
Sri Lanka	Dr HJPK Jayatillaka Medical Officer, Accident Service, National Hospital of Sri Lanka Colombo
Thailand	Dr.Tairjing Siriphanich Injury Prevention Group, Bureau of Non-Communicable Diseases, Ministry of Public Health, Bangkok
Timor-Leste	Mr Rafael Ximenes Head, Noncommunicable Diseases, Ministry of Health Dili

Table B.2: List of respondents

Bangladesh	
Dr Md Moyez Uddin Additional Director-General (Planning and Development) DGHS, Dhaka	Dr Md Mazharul Hoque Professor and Director Accident Research Institute, BUET Dhaka
Prof. Dr AKM Eshaque Director and Professor NITOR, Dhaka	Prof. Md Siraj-ul-Islam President, Bangladesh Orthopaedic Society Dhaka
Md Sayedur Rahman Deputy Police Commissioner Dhaka Metropolitan Police Dhaka	Md Zakir Hossain Executive Engineer, Road Safety Division, RHD, Ministry of Communication Dhaka
ABM Abu Bakar Siddique Accident Data Analyst Bangladesh Road Transport Authority Dhaka	ANM Salah Member, National Road Safety Council Department of Psychology, Rajshahi University, Rajshahi
Bhutan	
Mr Sonam Dorji Motor Vehicle Inspector, Road Safety & Transport Authority Thimphu	Dr Pakila Drukpa Forensic Specialist, Jigme Dorji Wangchuck National Referral Hospital Thimphu
Mr Namgay Officer-in-Charge, Traffic Division Royal Bhutan Police, Thimphu	
India	
Saroj Kumar Dash Joint Secretary (Transport and Administration) Department of Road Transport and Highways, Ministry of Shipping and Road Transport and Highways, Government of India, New Delhi	R.K. Verma Secretary-cum-Commissioner Transport Department Government of India New Delhi
Dr Bela Shah Sr DDG (NCD) Indian Council of Medical Research Government of India, New Delhi	Sudhir Awasthi Director National Crime Records Bureau Government of India, New Delhi
S.N. Shrivastava Jt. CP, Traffic, Delhi Traffic Police Government of India, New Delhi	Dr Vikram Kumar Director, Central Road Research Institute Government of India, New Delhi
Dr G. Gururaj Professor & Head, Department of Epidemiology NIMHNS, Bangalore 560 029	

Indonesia	
Eko Sutrisno Head of Sub-Unit of Traffic Information Traffic Information Jakarta	Ir. Besty Eranani Head of Sub-Directorate of Partnership & Directorate of Land Transport Safety Jakarta
A. Tejoksumo J. Head of Research & Development Dept. ORGANDA	Heru Sutomo Director, Gadjah Mada University Yogyakarta
Sri Sukiswati, S.Si Head Section of Transportation Statistical Statistics Centre Board, Jakarta	Jany Agustin Head of Subdirector Environmental Public Work Department, Jakarta
Ferial H. Idris Director, Centre of Disability Study Indonesia Jakarta	
Maldives	
Mohamed Usamath Legal Officer, Police Service Male'	Mohamed Zubair Deputy Director, Ministry of Transport Male'
Mariyam Waseela Programme Officer, Department of Public Health Male'	Ahmed Afaal Managing Director, ADK Hospital Sosun Magu, Henvairu Male' 20040
Myanmar	
U. Aung Naing Police Colonel, Myanmar Police Force Yangon	U. Aung Myint Director Road Transport Administration Department, Yangon
U. Mya Thein Chief Justice, Yangon Jurisprudence Office Yangon	U. Myint Thaug Professor, Myanmar Medical Association Yangon
U. Bo Htay Head of Department Yangon City Development Committee Yangon	U. Aye Kyu Director-General No. (3), Basic Education Department Yangon
U. Thint Myat Thu Head of Department Yangon Transport Planning Department Yangon	U. Zaw Wai Soe Associate Professor Yangon General Hospital Yangon

Nepal	
Sunil Poudyal Senior Divisional Engineer Road and Traffic Unit, Department of Road Kathmandu	Ek Narayan Koirala Police Inspector Nepal Police, Traffic Directorate Kathmandu
Deepak Devkota Mechanical Engineer Department of Transport Management Kathmandu	Subash Dhungel Traffic/Road Safety Consultant Kathmandu
Suresh Basnyat Statistical Officer, Central Bureau of Statistics Kathmandu	Dr. Sunil Joshi Asst Professor, Kathmandu Medical College Kathmandu
Sri Lanka	
Mr JAP Balasooriya Deputy Director Department of Census & Statistics, Colombo	Dr Samath Dharmaratne Senior Lecturer, University of Peradeniya Peradeniya 20400
Prof. Amal Kumarage Chairman, National Transport Commission Colombo	Dr Anil Jasinghe Deputy Director, Accident Service National Hospital, Colombo
Mr J.W. Chandrasekera Deputy Director, Planning Ministry of Transport, Colombo	Mrs S.S. Senanayake Director Programme, Road Development Authority, Colombo
Mr Lucky Peris Director, Traffic Administration & Road Safety Department of Police, Colombo	
Thailand	
Kriangdej Juntrawong Police Colonel Traffic Development and Civil Service Division Royal Thai Police, Bangkok	Chamroon Tangpaisalkit Office of Transport and Traffic Policy and Planning Bangkok
Suchart Klinzuwan Department of Land Transport Bangkok	Chayan Sirimas Disaster and Safety Integrated Management Bureau, Bangkok
Dr Pimpa Techakamoluk Bureau of Epidemiology Ministry of Public Health	Dr Pichai Taneerananon Associate Professor Thailand Accident Research Centre, Bangkok
Mrs Suchada Gerdmongkolgan Bureau of Noncommunicable Disease Bangkok	

Timor-Leste	
Joao E.C. da Silva Head - Dept. of National Traffic Directorate of Land Transport (DNTT) Ministry of Infrastructure, Dili	Aleixo H.G. Iepes Directorate of Road Engineering Dili Region, Ministry of Infrastructure Dili
Jose Campos Head, Department of Medical Registry National Hospital of Guido Valadares Ministry of Health, Dili	Mateus de Jesus Soares Dili District Police Station Dili
Jose de Araujo Head, Department of National Ambulance Ministry of Health Dili	Craig Thomson Head, Traffic Unit UN Police (UNPOL) Dili

Country profiles

Explanatory notes for the Country Profiles

Background

The Country Profiles in this section present a selection of information about road safety as reported by each of the 10 participating countries of the WHO South-East Asia Region.

Terminology and interpretation

The following terms and issues should be considered when reviewing the individual Country Profile:

- The questionnaire asked for information on a number of topics, with follow-up questions exploring each topic in further detail. For many topics respondents were asked to skip follow-up questions depending on their answer to the top-level question. Consequently, the Country Profiles do not report information from follow-up questions if these should have been skipped. However, if these questions were answered the responses are recorded in the Statistical Annex.
- Road classifications (in particular the definition of an “urban road”, a “rural road” and a “highway”) vary greatly from country to country. Respondents were asked to report on the speed limits of different kinds of road according to the definitions used in the country concerned.
- Respondents were asked, as individuals, to rate the effectiveness of enforcement of various elements of national road safety legislations on the basis of their professional opinion or perception. A scale of 0 to 10 was used, where 0 was “not effective” and 10 was “highly effective”. The group of respondents then tried to reach a consensus on an enforcement score. These scores are, therefore, subjective and should be seen only as an indication of how enforcement is perceived in the country. Many respondents expressed difficulty in assessing law enforcement at a national level since it often varies from region to region within a country and the intensity of the enforcement may vary at different times.
- Blood alcohol concentration (BAC) limits refer to the maximum amount of alcohol that is legally acceptable in the blood of a

- driver on the road, i.e. the blood alcohol level above which a driver may be punished by law. For the purposes of this report, the BAC limit in countries where alcohol consumption is prohibited has been recorded as zero with an explanatory footnote.
- Where respondents provided explanatory information on rates of helmet wearing and/or seat-belt use—for instance, a description of the methodology or geographical coverage—this information is reported in footnotes.
 - A motorcycle helmet law is assessed as “applies to all riders – yes” if the law requires drivers and passengers (both adults and children) to wear a helmet. Laws with exceptions on the grounds of religion, medical conditions or other reasons are indicated with the footnote “some exceptions”.
 - Respondents were asked to report on vehicle standards required for car manufacturers or assemblers in the country. Therefore, no information is included on vehicle standards for countries where manufacture or assembly do not take place. Some countries apply stringent standards to imported vehicles but data on such standards were not collected as part of this survey.
 - Variables have been coded “Data not available (–)” if the information was not provided through the national data collection process.
- ### **Presentation of data**
- Country Profiles contain data on road traffic deaths and injuries as reported by countries/areas.
- Data from different countries are not necessarily comparable, as different definitions and time frames have been used.
 - Due to space constraints in footnotes, the data source has been summarized as Police, Transport or Health if the data are from the Police Department/ Ministry of Interior, Ministry of Transport or Ministry of Health, respectively.
 - The proportion of deaths where the sex is unknown has not been reported in the Profiles.
- In the charts presenting data on deaths by road-user category, proportions may not add up to 100% due to rounding of figures. Some countries classify road traffic deaths according to the vehicle or road-user “at fault” rather than according to who died, or use categories different from those requested in the questionnaire. In these countries deaths among vulnerable road-users are even more likely to be underreported.

The standard colour coding of the pie-charts used in the Country Profiles to represent the road-user categories requested in the questionnaire is shown below. Additional categories are represented by non-standard colours.

- Drivers of four-wheeled vehicles
- Cyclists
- Passengers of four-wheeled vehicles
- Pedestrians
- Occupants (drivers/passengers) of four-wheeled vehicles
- Others
- Riders (drivers/passengers) of motorized two- or three-wheelers
- Unspecified

Trend graphs are shown either as road traffic death rates per 100 000 population (on a green background) or

as an absolute number of road traffic deaths, depending on which figures were supplied by the country.

Where the primary source of information for both the pie and trend graphs was not stipulated, the source has been reported as “Country questionnaire”.

Information about the number of vehicles in the country includes only registered vehicles and proportions of various types of such vehicles. These proportions may not add up to 100% due to rounding. In some countries, respondents noted that a substantial proportion of the vehicle fleet may not be registered.

Bangladesh

Population: 158 664 959 (2007)

Income group: Low

Gross national income per capita: \$ 470 (2008)

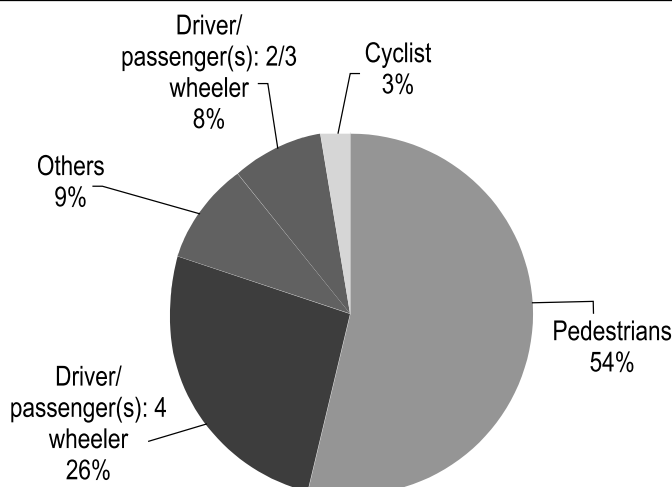
Institutional Framework	
Lead agency	National Road Safety Council
Funded in national budget	No
National Road Safety Strategy	Yes
Measurable targets	Yes
Funding	Yes

Magnitude of road traffic injury	
Reported number of road traffic deaths (2006)	3 160 ^a (89% males, 11% Females)
Reported number of road traffic injuries (2003)	403 000 ^b
Costing study available	Yes (for both deaths and injuries)
*Estimated annual economic cost of road traffic injuries and/or deaths	45 billion Bangladeshi Taka (2003)

^a Police data, defined as died at crash scene. Respondents concerned this figure grossly underestimates the true scenario citing example of Bangladesh Health and Injury Survey 2003 which estimated the annual number of road traffic deaths to be 13 200.

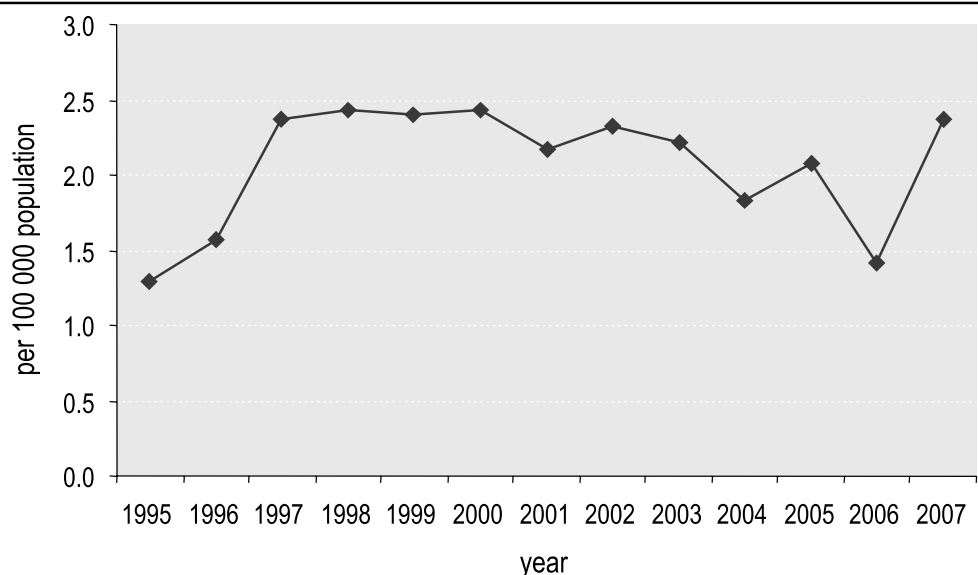
^b Bangladesh Health and Injury Survey 2003 data.

Deaths by road user categories, Bangladesh 2006



Source: National Road Traffic Accident Report 2006, BRTA

Trends in road traffic deaths, Bangladesh (1995-2007)



Source: National Road Safety Action Plan 2008-2010, National Road Safety Council

Registered vehicles	
Total number of registered vehicles	1 054 057 (2007)^c
Motorcars	15%
Motorized 2 and 3-wheelers	62%
Minibuses, vans etc. (seating>20)	10%
Trucks	6%
Buses	3%
Others	4%

^c As per Bangladesh Road Transport Authority

National legislation	
Speed limits set nationally	Yes
Maximum limit urban roads	25 km/h
Ability of local authorities to modify national speed limit	No
Enforcement of speed limit law ^d	① 1 2 3 4 5 6 7 8 9 10
Drink-driving law	Yes
BAC limit – general population	None
BAC limit – young or novice driver	None
Random breath testing and/or police check points	No

Road traffic mortality contributed by alcohol	-
Enforcement of drink-driving law ^d	0 ① 2 3 4 5 6 7 8 9 10
Motorcycle helmet law	Yes
Applies to all riders	Yes
Helmet standards mandate	No
Helmet wearing rate at national level	-
Enforcement of motorcycle helmet use law ^d	0 1 2 ③ 4 5 6 7 8 9 10
Seat-belt law	No
Applies to all occupants	n/a
Seat-belt wearing rate at national level	-
Enforcement of seat-belt use law ^d	n/a
Child restraints law	No
Enforcement of seat-belt use law ^d	n/a

^d Enforcement score represents consensus based on professional opinion of respondents, on a scale of 0 to 10 where 0 is not effective and 10 is highly effective.

Vehicle standards	
No car manufacturer	
Types of new drivers assessment/test for driving licence	
Theoretical assessment/test	Yes
Practical assessment/test	Yes
Others (please specify)	No
Road safety audit	
Formal road safety audit required for major new road construction projects	No
Regular audits of existing road infrastructure	No
Existing other measures to reduce exposure and prevent road traffic injuries	
National policies to promote walking or cycling	No
National policy to promote public transportation	No
Post-crash care	
Formal publicity on available pre-hospital care system	No
Nation-wide universal access phone number for pre-hospital care	n/a
Regional or local access phone numbers for pre-hospital care	n/a

Bhutan

Population: 658 479 (2007)

Income group: Middle

Gross national income per capita: \$ 1 770 (2008)

Institutional Framework	
Lead agency	Road Safety and Transport Authority
Funded in national budget	Yes
National Road Safety Strategy	No
Measurable targets	n/a
Funding	n/a

Magnitude of road traffic injury	
Reported number of road traffic deaths (2006-2007)	111 ^a (93% males, 7% Females)
Reported number of road traffic injuries (2006-2007)	724 ^b
Costing study available	No
Estimated annual economic cost of road traffic injuries and/or deaths	n/a

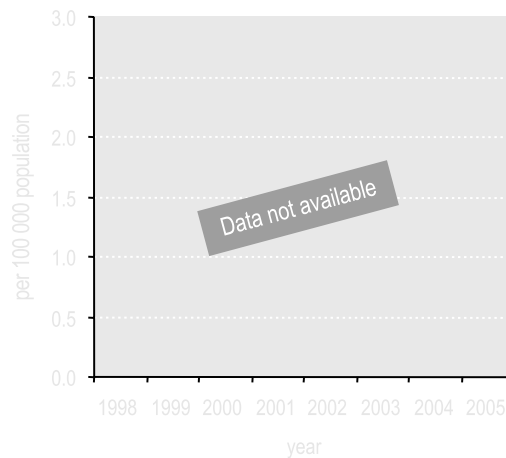
^a Police data, defined as died within 30 days of crash.

^b Police data.

Deaths by road user categories, Bhutan



Trends in road traffic deaths, Bhutan



Registered vehicles	
Total number of registered vehicles	35 703 (2007)^c
Motorcars	55%
Motorized 2 and 3-wheelers	21%
Minibuses, vans etc. (seating>20)	1%
Trucks	13%
Buses	0% ^d
Others	9%

^c As per Road Safety and Transport Authority

^d Buses less than 1%

National legislation	
Speed limits set nationally	Yes
Maximum limit urban roads	30 km/h
Ability of local authorities to modify national speed limit	No
Enforcement of speed limit law ^e	0 1 2 ③ 4 5 6 7 8 9 10
Drink-driving law	Yes
BAC limit – general population	0 .08g/dl
BAC limit – young or novice driver	0 .08g/dl
Random breath testing and/or police check points	No
Road traffic mortality contributed by alcohol	-
Enforcement of drink-driving law ^e	0 1 2 ③ 4 5 6 7 8 9 10
Motorcycle helmet law	Yes
Applies to all riders	Yes
Helmet standards mandate	Yes
Helmet wearing rate at national level	-
Enforcement of motorcycle helmet use law ^e	0 1 2 3 4 5 6 7 8 ⑨ 10
Seat-belt law	Yes
Applies to all occupants	Yes
Seat-belt wearing rate at national level	-
Enforcement of seat-belt use law ^e	0 1 2 3 ④ 5 6 7 8 9 10
Child restraints law	No
Enforcement of seat-belt use law ^e	n/a

^e Enforcement score represents consensus based on professional opinion of respondents, on a scale of 0 to 10 where 0 is not effective and 10 is highly effective.

Vehicle standards	
No car manufacturer	
Types of new drivers assessment/test for driving licence	
Theoretical assessment/test	Yes
Practical assessment/test	Yes
Others (please specify)	No
Road safety audit	
Formal road safety audit required for major new road construction projects	No
Regular audits of existing road infrastructure	No
Existing other measures to reduce exposure and prevent road traffic injuries	
National policies to promote walking or cycling	No
National policy to promote public transportation	No
Post-crash care	
Formal publicity on available pre-hospital care system	No
Nation-wide universal access phone number for pre-hospital care	Yes ^f

^f Although, there is no formal pre-hospital care system in Bhutan but free ambulance services are available. Universal access phone number for ambulance service is 112.

India

Population: 1 169 015 509 (2007)

Income group: Low

Gross national income per capita: \$ 950 (2008)

Institutional Framework	
Lead agency	Department of Road Transport and Highways
Funded in national budget	Yes
National Road Safety Strategy	Yes ^a
Measurable targets	n/a
Funding	n/a

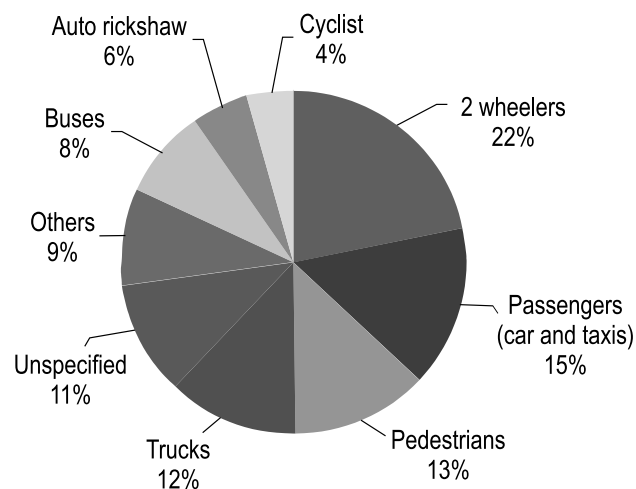
^a Not formally endorsed by the government

Magnitude of road traffic injury	
Reported number of road traffic deaths (2006)	105 725 ^b (93% males, 7% Females)
Reported number of road traffic injuries (2006)	452 922 ^c
Costing study available	Yes (for both deaths and injuries)
*Estimated annual economic cost of road traffic injuries and/or deaths	55 000 Crores INR (2000)

^b Police data, defined as died within 30 days of crash and reporting year is 2006, new data for 2007 available.

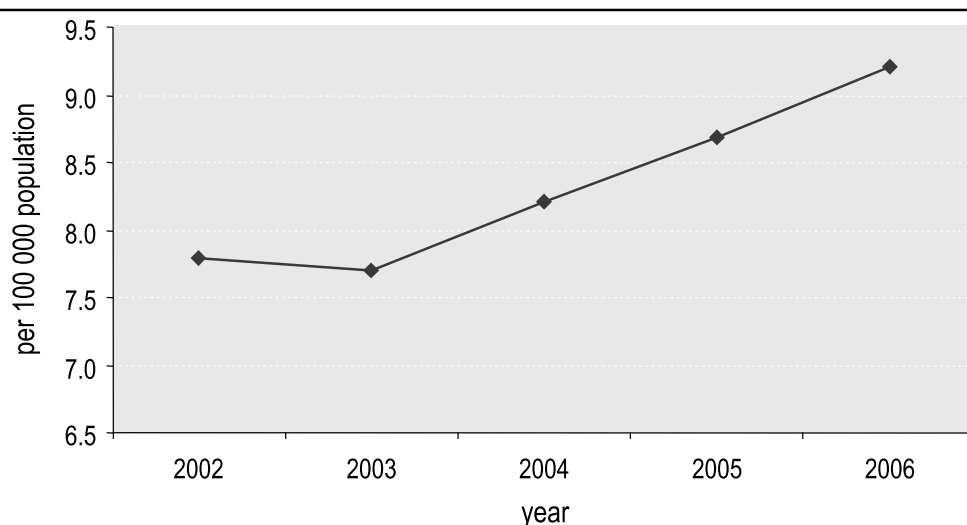
^c Police data.

Deaths by road user categories, India 2006



Source: Road accidents in India 2006, Ministry of Shipping, Road Transport and Highways

Trends in road traffic deaths, India (2002-2006)



Source: National Crime Records Bureau (2006)

Registered vehicles	
Total number of registered vehicles	72 718 000 (2004)^d
Truck and Lorries	3%
Light motor vehicles (Goods and passengers)	5%
Buses	1%
Two wheelers	71%
Cars, jeeps and taxis	13%
Tractors and trailers	6%
Others	1%

^d As per Department of Road Transport and Highways, Ministry of Shipping, Road Transport and Highways

National legislation	
Speed limits set nationally	No (sub-nationally)
Maximum limit urban roads	n/a
Ability of local authorities to modify national speed limit	n/a
Enforcement of speed limit law ^e	n/a
Drink-driving law	Yes
BAC limit – general population	0 .03g/dl
BAC limit – young or novice driver	0 .03g/dl
Random breath testing and/or police check points	Yes
Road traffic mortality contributed by alcohol	-
Enforcement of drink-driving law ^e	0 1 2 ③ 4 5 6 7 8 9 10

Motorcycle helmet law	Yes
Applies to all riders	Yes ^f
Helmet standards mandate	Yes
Helmet wearing rate at national level	-
Enforcement of motorcycle helmet use law ^e	0 1 ② 3 4 5 6 7 8 9 10
Seat-belt law	Yes
Applies to all occupants	Yes
Seat-belt wearing rate at national level	-
Enforcement of seat-belt use law ^e	0 1 ② 3 4 5 6 7 8 9 10
Child restraints law	No
Enforcement of seat-belt use law ^e	n/a

^e Enforcement score represents consensus based on professional opinion of respondents, on a scale of 0 to 10 where 0 is not effective and 10 is highly effective.

^f Some exceptions

Vehicle standards	
Car manufactured required to adhere to standards on	
Fuel consumption	No
Seat-belt installation for all seats	No
Types of new drivers assessment/test for driving licence	
Theoretical assessment/test	Yes
Practical assessment/test	Yes
Others (please specify)	Yes (Medical fitness examination)
Road safety audit	
Formal road safety audit required for major new road construction projects	No ^g
Regular audits of existing road infrastructure	No
Existing other measures to reduce exposure and prevent road traffic injuries	
National policies to promote walking or cycling	Yes
National policy to promote public transportation	Yes

^g Informal check is being done

Post-crash care	
Formal publicity on available pre-hospital care system	Yes
Nation-wide universal access phone number for pre-hospital care	Yes ^h

^h Universal no. is 102

Indonesia

Population: 231 626 978 (2007)

Income group: Middle

Gross national income per capita: \$ 1 650 (2008)

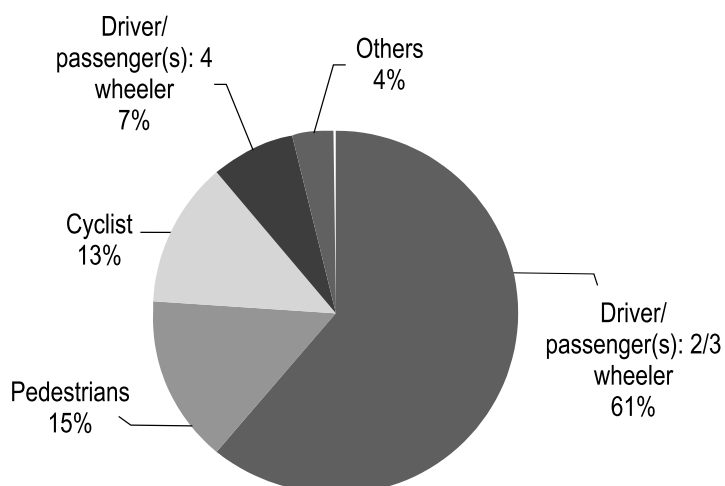
Institutional Framework	
Lead agency	National Cabinet
Funded in national budget	Yes
National Road Safety Strategy	Multiple
Measurable targets	n/a
Funding	n/a

Magnitude of road traffic injury	
Reported number of road traffic deaths (2007)	16 548 ^a (73% males, 27% Females)
Reported number of road traffic injuries (2007)	66 040 ^b
Costing study available	Yes (for deaths only)
Estimated annual economic cost of road traffic injuries and/or deaths	41.4 Trillion Rupiah (2002)

^a Police data, defined as died within 30 days of crash.

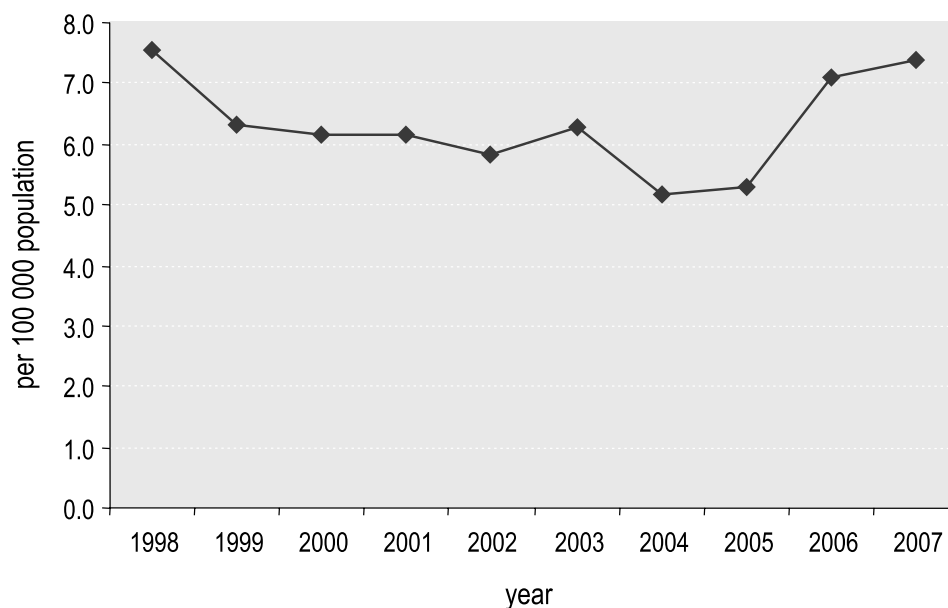
^b Police data.

Deaths by road user categories, Indonesia 2008



Source: National Police (2008), based on road traffic death on scene data collected from 3 provinces in Indonesia (South Sumatra, Bali, South Kalimantan) from 2007 to mid May 2008

Trends in road traffic deaths, Indonesia (1998-2007)



Source: National Police, 2008.

Registered vehicles

Total number of registered vehicles	63 318 522 (2007) ^c
Motorcars	15%
Motorized 2 and 3-wheelers	73%
Trucks	8%
Buses	4%

^cAs per National Police Department

National legislation

Speed limits set nationally	Yes
Maximum limit urban roads	70 km/h
Ability of local authorities to modify national speed limit	Yes
Enforcement of speed limit law ^d	0 1 2 ③ 4 5 6 7 8 9 10
Drink-driving law	No
BAC limit – general population	n/a
BAC limit – young or novice driver	n/a
Random breath testing and/or police check points	n/a
Road traffic mortality contributed by alcohol	-
Enforcement of drink-driving law ^d	n/a

Motorcycle helmet law	Yes
Applies to all riders	Yes ^e
Helmet standards mandate	Yes
Helmet wearing rate at national level	93% ^f
Enforcement of motorcycle helmet use law ^d	0 1 2 3 4 5 6 7 8 9 10
Seat-belt law	Yes
Applies to all occupants	No
Seat-belt wearing rate at national level	85% ^g
Enforcement of seat-belt use law ^d	0 1 2 3 4 5 6 7 8 9 10
Child restraints law	No
Enforcement of seat-belt use law ^d	n/a

^d Enforcement score represents consensus based on professional opinion of respondents, on a scale of 0 to 10 where 0 is not effective and 10 is highly effective.

^e Some exceptions.

^f National rate estimates from a study of helmet wearing in 31 cities of 10 provinces, 2007.

^g Jakarta Survey 2005.

Vehicle standards	
Car manufactured required to adhere to standards on	
Fuel consumption	Yes
Seat-belt installation for all seats	No
Types of new drivers assessment/test for driving licence	
Theoretical assessment/test	Yes
Practical assessment/test	Yes
Others (please specify)	No
Road safety audit	
Formal road safety audit required for major new road construction projects	No ^h
Regular audits of existing road infrastructure	No
Existing other measures to reduce exposure and prevent road traffic injuries	
National policies to promote walking or cycling	Yes
National policy to promote public transportation	Yes
Post-crash care	
Formal publicity on available pre-hospital care system	Yes
Nation-wide universal access phone number for pre-hospital care	Yes ⁱ

^h Informal check is being done

ⁱ Universal no. is 118–ambulance, 113–fire department, 112–police department and 1717–police SMS centre

Maldives

Population: 305 556 (2007)

Income group: Middle

Gross national income per capita: \$ 3 200 (2008)

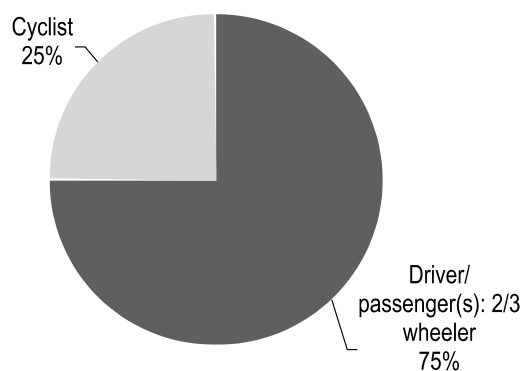
Institutional Framework	
Lead agency	Ministry of Home Affairs
Funded in national budget	No
National Road Safety Strategy	Yes ^a
Measurable targets	Yes
Funding	Yes

^a National Strategic Plan for 2007-2010

Magnitude of road traffic injury	
Reported number of road traffic deaths (2007)	8 ^b (87.5% males, 12.5% Females)
Reported number of road traffic injuries	-
Costing study available	No
Estimated annual economic cost of road traffic injuries and/or deaths	n/a

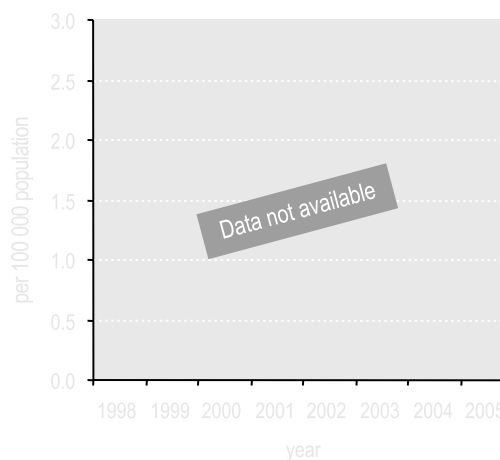
^b Police data, defined as died within 30 days of crash

Deaths by road user categories, Maldives 2007



Source: Maldives Police Service, 2007

Trends in road traffic deaths, Maldives



Registered vehicles	
Total number of registered vehicles	33 807 (2007)^c
Motorcars	8%
Motorized 2 and 3-wheelers	79%
Minibuses, vans etc. (seating <20 person)	7%
Trucks	1%
Buses	0% ^d
Others	5%

^c As per Ministry of Transport

^d Less than 1%

National legislation	
Speed limits set nationally	Yes
Maximum limit urban roads	30 km/h
Ability of local authorities to modify national speed limit	No
Enforcement of speed limit law ^e	0 1 2 3 4 ⑤ 6 7 8 9 10
Drink-driving law	No
BAC limit – general population	n/a
BAC limit – young or novice driver	n/a
Random breath testing and/or police check points	n/a
Road traffic mortality contributed by alcohol	-
Enforcement of drink-driving law ^e	n/a
Motorcycle helmet law	No
Applies to all riders	n/a
Helmet standards mandate	n/a
Helmet wearing rate at national level	-
Enforcement of motorcycle helmet use law ^e	n/a
Seat-belt law	No
Applies to all occupants	n/a
Seat-belt wearing rate at national level	-
Enforcement of seat-belt use law ^e	n/a
Child restraints law	No
Enforcement of seat-belt use law ^e	n/a

^e Enforcement score represents consensus based on professional opinion of respondents, on a scale of 0 to 10 where 0 is not effective and 10 is highly effective.

Vehicle standards	
No car manufacturer	
Types of new drivers assessment/test for driving licence	
Theoretical assessment/test	Yes
Practical assessment/test	Yes
Others (please specify)	No
Road safety audit	
Formal road safety audit required for major new road construction projects	No
Regular audits of existing road infrastructure	No
Existing other measures to reduce exposure and prevent road traffic injuries	
National policies to promote walking or cycling	No
National policy to promote public transportation	No
^h Informal check is being done	
Post-crash care	
Formal publicity on available pre-hospital care system	No
Nation-wide universal access phone number for pre-hospital care	n/a

Myanmar

Population: 48 798 212 (2007)

Income group: Low

Gross national income per capita: \$ 281 (2008)

Institutional Framework	
Lead agency	Traffic Rules Enforcement Supervisory Committee
Funded in national budget	No
National Road Safety Strategy	Yes
Measurable targets	Yes
Funding	Yes

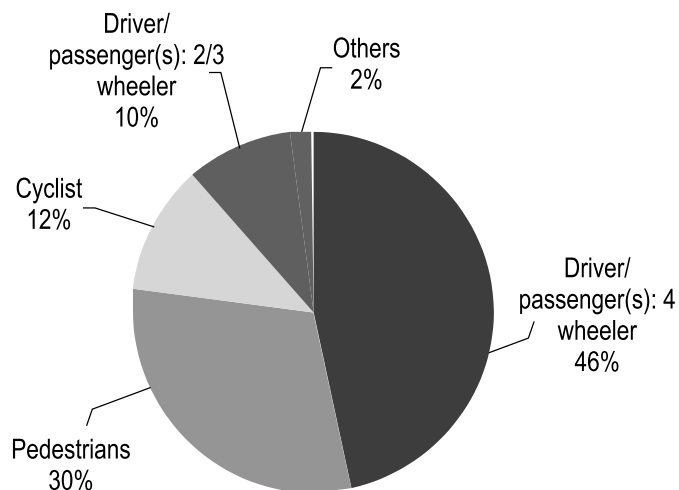
Magnitude of road traffic injury	
Reported number of road traffic deaths (2007)	1638 ^a (75% males, 25% Females) ^b
Reported number of road traffic injuries (2007)	12 358 ^c
Costing study available	Yes (for both deaths and injuries)
Estimated annual economic cost of road traffic injuries and/or deaths	9.4 Billion Kyat (2003)

^a Police, transport and health data, defined as died within 30 days of crash.

^b This estimation is only for Yangon division.

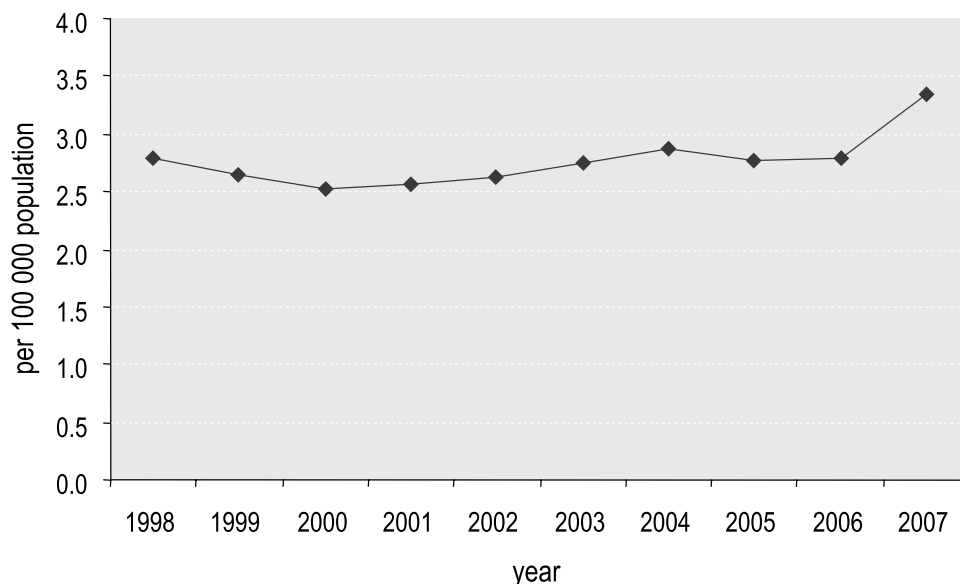
^c Police and transport data.

Deaths by road user categories, Myanmar 2007



Source: Road Traffic Administration Department

Trends in road traffic deaths



Source: Country questionnaire.

Registered vehicles	
Total number of registered vehicles	1 045 105 (2008)^d
Motorcars	26%
Motorized 2 and 3-wheelers	65%
Minibuses, vans, etc. (seating < 20 person)	2%
Trucks	3%
Buses	2%
Others	2%

^d As per Road Transport Administration Department (Till May 2008)

National legislation	
Speed limits set nationally	Yes
Maximum limit urban roads	40 km/h
Ability of local authorities to modify national speed limit	Yes
Enforcement of speed limit law ^e	0 1 2 3 4 ⑤ 6 7 8 9 10
Drink-driving law	Yes
BAC limit – general population	0.07 g/dl
BAC limit – young or novice driver	-
Random breath testing and/or police check points	Yes
Road traffic mortality contributed by alcohol	-
Enforcement of drink-driving law ^e	0 1 2 3 4 ⑤ 6 7 8 9 10

Motorcycle helmet law	Yes
Applies to all riders	Yes ^f
Helmet standards mandate	Yes
Helmet wearing rate at national level	60% ^g
Enforcement of motorcycle helmet use law ^e	0 1 2 3 4 5 6 7 8 9 10
Seat-belt law	-
Applies to all occupants	-
Seat-belt wearing rate at national level	-
Enforcement of seat-belt use law ^e	-
Child restraints law	-
Enforcement of seat-belt use law ^e	-

^e Enforcement score represents consensus based on professional opinion of respondents, on a scale of 0 to 10 where 0 is not effective and 10 is highly effective.

^f Some exceptions.

^g Road Transport Administration Department, 2008.

Vehicle standards	
Car manufactured required to adhere to standards on	Yes
Fuel consumption	
Seat-belt installation for all seats	No
Types of new drivers assessment/test for driving licence	
Theoretical assessment/test	Yes
Practical assessment/test	Yes
Others (please specify)	Yes (colour blindness test and appearance test)
Road safety audit	
Formal road safety audit required for major new road construction projects	Yes
Regular audits of existing road infrastructure	Yes ^h
Existing other measures to reduce exposure and prevent road traffic injuries	
National policies to promote walking or cycling	Yes
National policy to promote public transportation	Yes

^h Ministry of Construction, City Development Committee conduct road safety audit on regular basis

Post-crash care	
Formal publicity on available pre-hospital care system	Yes ⁱ
Nation-wide universal access phone number for pre-hospital care	No
Regional or local access phone numbers for pre-hospital care	Yes ^j

ⁱ Formal publicity at regional and local level

^j Regional or local access phone number is 01500005

Nepal

Population: 28 195 994 (2007)

Income group: Low

Gross national income per capita: \$ 340 (2008)

Institutional Framework	
Lead agency	Ministry of Physical Planning and Works, Department of Road
Funded in national budget	Yes
National Road Safety Strategy	Yes ^a
Measurable targets	n/a
Funding	n/a

^a Not formally endorsed by the government

Magnitude of road traffic injury	
Reported number of road traffic deaths (2007)	962 ^b (80% males, 20% Females)
Reported number of road traffic injuries (2007)	2 653 ^c
Costing study available	Yes (for both deaths and injuries)
Estimated annual economic cost of road traffic injuries and/or deaths	NRS. 771,863,874 (1996)

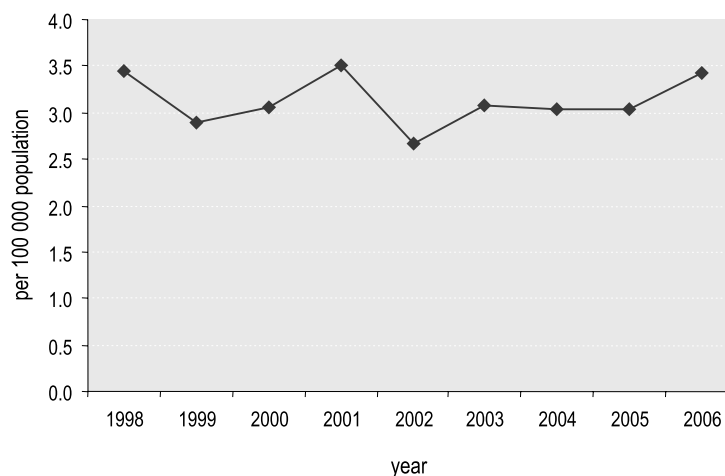
^b Police data, defined as died within 35 days of crash.

^c Police data.

Deaths by road user categories, Nepal



Trends in road traffic deaths



Source: Country questionnaire.

Registered vehicles	
Total number of registered vehicles	617 305 (2007)^d
Motorcars, jeeps, vans	14%
Motorized 2 and 3-wheelers	69%
Minibuses, pick-ups, microbuses	2%
Trucks, cranes	5%
Buses	3%
Others	7%

^d As per Department of Vehicle and Transport Management

National legislation	
Speed limits set nationally	Yes
Maximum limit urban roads	40 km/h
Ability of local authorities to modify national speed limit	No
Enforcement of speed limit law ^e	0 1 2 3 4 5 6 7 8 9 10
Drink-driving law	Yes
BAC limit – general population	none ^f
BAC limit – young or novice driver	none ^f
Random breath testing and/or police check points	Yes
Road traffic mortality contributed by alcohol	- ^g
Enforcement of drink-driving law ^e	0 1 2 3 4 5 6 7 8 9 10
Motorcycle helmet law	Yes
Applies to all riders	Yes
Helmet standards mandate	No
Helmet wearing rate at national level	-
Enforcement of motorcycle helmet use law ^e	0 1 2 3 4 5 6 7 8 9 10
Seat-belt law	Yes
Applies to all occupants	No
Seat-belt wearing rate at national level	-
Enforcement of seat-belt use law ^e	0 1 2 3 4 5 6 7 8 9 10
Child restraints law	No
Enforcement of seat-belt use law ^e	n/a

^e Enforcement score represents consensus based on professional opinion of respondents, on a scale of 0 to 10 where 0 is not effective and 10 is highly effective.

^f Drink-driving not defined by BAC limit

^g No data on deaths but proportion of annual road traffic crashes caused by alcohol estimated at 11%.

Vehicle standards	
No car manufacturer	
Types of new drivers assessment/test for driving licence	
Theoretical assessment/test	Yes
Practical assessment/test	Yes
Others (please specify)	No
Road safety audit	
Formal road safety audit required for major new road construction projects	No ^h
Regular audits of existing road infrastructure	No
Existing other measures to reduce exposure and prevent road traffic injuries	
National policies to promote walking or cycling	No
National policy to promote public transportation	No

^h Informal check is being done

Post-crash care	
Formal publicity on available pre-hospital care system	No ⁱ
Nation-wide universal access phone number for pre-hospital care	n/a

ⁱ But almost all ambulance service are free with some expectation

Sri Lanka

Population: 19 299 190 (2007)

Income group: Middle

Gross national income per capita: \$ 1 540 (2008)

Institutional Framework	
Lead agency	National Council for Road safety
Funded in national budget	No
National Road Safety Strategy	Yes ^a
Measurable targets	n/a
Funding	n/a

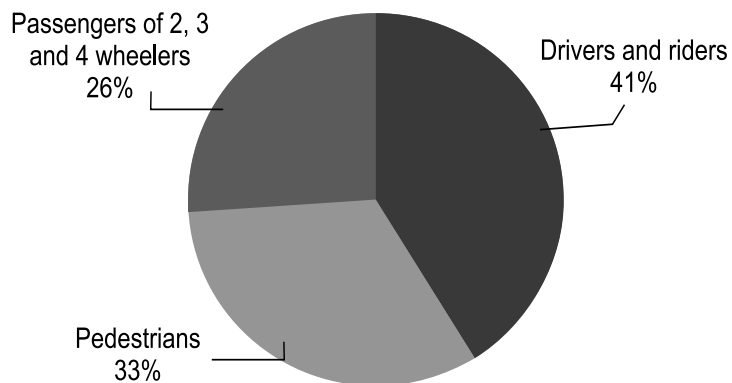
^a Not formally endorsed by the government

Magnitude of road traffic injury	
Reported number of road traffic deaths (2007)	2 334 ^b (82% males, 18% Females)
Reported number of road traffic injuries (2006)	31 688 ^c
Costing study available	Yes (for both deaths and injuries)
Estimated annual economic cost of road traffic injuries and/or deaths	9.34 Billion local currency (2007)

^b Police data, defined as died within 30 days of crash.

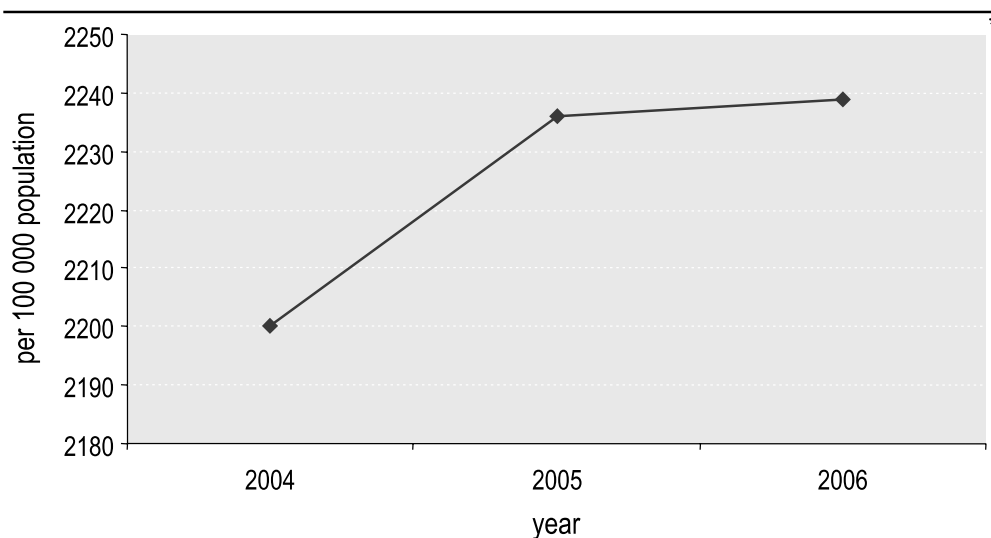
^c Police data.

Deaths by road user categories, Sri Lanka 2006



Source: Traffic Police, 2006.

Trends in road traffic deaths



*Since the rate for road traffic deaths was almost same, total numbers of deaths were considered
Source: Traffic Police.

Registered vehicles

Total number of registered vehicles	3 125 794 (2007) ^d
Motorcars	12%
Motorized 2 and 3-wheelers	63%
Minibuses, vans etc. (seating>20)	6%
Trucks	8%
Buses	3%
Others	8%

^d As Department of Motor Traffic.

National legislation

Speed limits set nationally	Yes
Maximum limit urban roads	50 km/h
Ability of local authorities to modify national speed limit	No
Enforcement of speed limit law ^e	0 1 2 3 4 5 6 7 8 9 10
Drink-driving law	Yes
BAC limit – general population	0.08 g/dl
BAC limit – young or novice driver	0.08 g/dl
Random breath testing and/or police check points	Yes
Road traffic mortality contributed by alcohol	-
Enforcement of drink-driving law ^e	0 1 2 3 4 5 6 7 8 9 10

National legislation	
Motorcycle helmet law	Yes
Applies to all riders	Yes ^f
Helmet standards mandate	Yes
Helmet wearing rate at national level	-
Enforcement of motorcycle helmet use law ^e	0 1 2 3 4 5 6 7 8 9 10
Seat-belt law	No
Applies to all occupants	n/a
Seat-belt wearing rate at national level	-
Enforcement of seat-belt use law ^e	n/a
Child restraints law	No
Enforcement of seat-belt use law ^e	n/a

^e Enforcement score represents consensus based on professional opinion of respondents, on a scale of 0 to 10 where 0 is not effective and 10 is highly effective.

^f Some exceptions.

Vehicle standards	
No Car manufacturer	
Types of new drivers assessment/test for driving licence	
Theoretical assessment/test	Yes
Practical assessment/test	Yes
Others (please specify)	No
Road safety audit	
Formal road safety audit required for major new road construction projects	No ^g
Regular audits of existing road infrastructure	No
Existing other measures to reduce exposure and prevent road traffic injuries	
National policies to promote walking or cycling	No
National policy to promote public transportation	Yes

^g Informal check is being done

Post-crash care	
Formal publicity on available pre-hospital care system	Yes ^h
Nation-wide universal access phone number for pre-hospital care	Yes ⁱ

^h Only in few district

ⁱ Universal access phone number is 110.

Thailand

Population: 63 883 662 (2007)

Income group: Middle

Gross national income per capita: \$ 3 400 (2208)

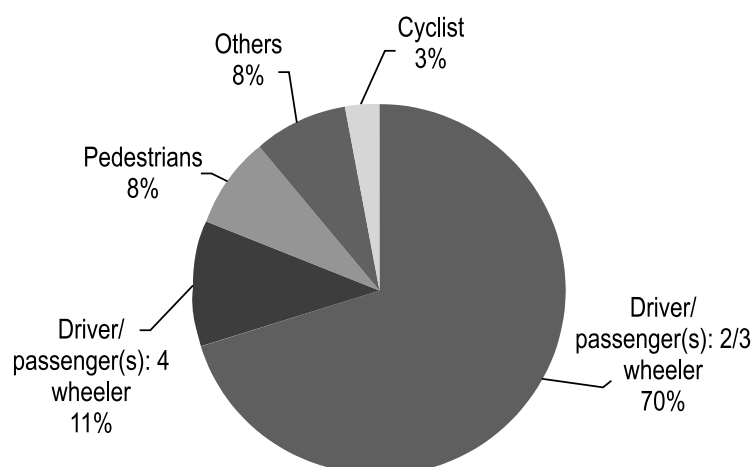
Institutional Framework	
Lead agency	Road Safety Operation Center
Funded in national budget	Yes
National Road Safety Strategy	Yes
Measurable targets	Yes
Funding	Yes

Magnitude of road traffic injury	
Reported number of road traffic deaths (2007)	12 492 ^a (73% males, 27% Females)
Reported number of road traffic injuries (2006)	973 104 ^b
Costing study available	Yes (for both deaths and injuries)
Estimated annual economic cost of road traffic injuries and/or deaths	282 355 million Baht (2007)

^a Police data, defined as died at the scene of the crash.

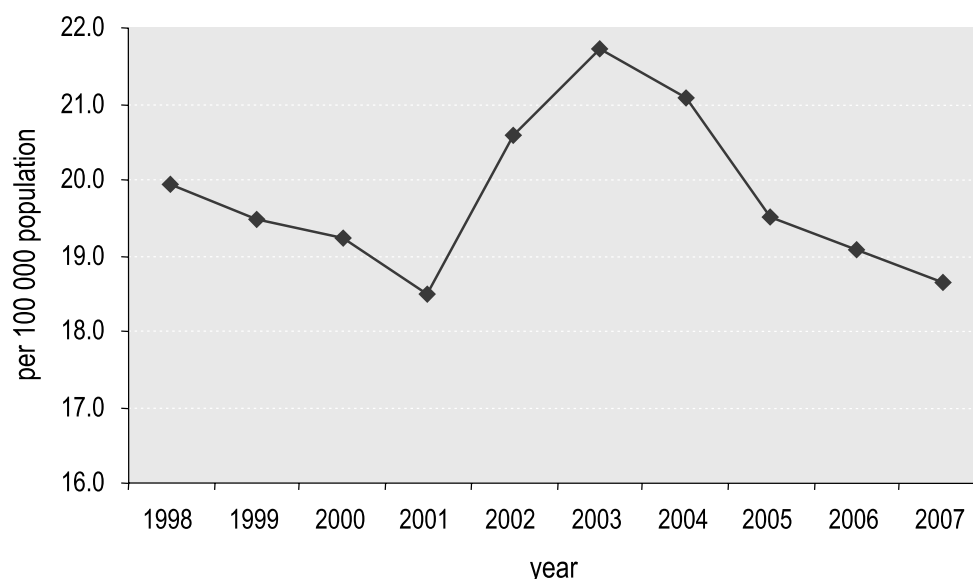
^b Police data.

Deaths by road user categories, Thailand 2007



Source: Injury Surveillance (sentinel sites), Bureau of Epidemiology, Ministry of Public Health, 2007.

Trends in road traffic deaths, Thailand (1998-2007)



Source: Police Information System Centre, Royal Thai Police

Registered vehicles

Total number of registered vehicles	25 618 447 (2007) ^c
Motorcars	14%
Motorized 2 and 3-wheelers	63%
Minibuses, vans, etc (seating < 20 persons)	19%
Trucks	3%
Others (including buses)	1%

^cAs per Land Transport Management Bureau, Department of Land Transport

National legislation

Speed limits set nationally	Yes
Maximum limit urban roads	80 km/h
Ability of local authorities to modify national speed limit	Yes
Enforcement of speed limit law ^d	0 1 ② 3 4 5 6 7 8 9 10
Drink-driving law	Yes
BAC limit – general population	0.05 g/dl
BAC limit – young or novice driver	0.05 g/dl
Random breath testing and/or police check points	Yes
Road traffic mortality contributed by alcohol	34.8% ^e
Enforcement of drink-driving law ^d	0 1 2 3 4 ⑤ 6 7 8 9 10

Motorcycle helmet law	Yes
Applies to all riders	Yes ^f
Helmet standards mandate	Yes
Helmet wearing rate at national level	27% ^g
Enforcement of motorcycle helmet use law ^d	0 1 2 3 ④ 5 6 7 8 9 10
Seat-belt law	Yes
Applies to all occupants	No
Seat-belt wearing rate at national level	56% (front seat) ^h
Enforcement of seat-belt use law ^d	0 1 2 3 4 ⑤ 6 7 8 9 10
Child restraints law	No
Enforcement of seat-belt use law ^d	n/a

^d Enforcement score represents consensus based on professional opinion of respondents, on a scale of 0 to 10 where 0 is not effective and 10 is highly effective.

^e Estimated by Bureau of Epidemiology, Ministry of Public Health.

^f Some exceptions.

^g Behavioural Risk Factor Surveillance System, 2005.

^h Behavioural Risk Factor Surveillance System, Front seat occupants only. 2005.

Vehicle standards	
Car manufactured required to adhere to standards on	
Fuel consumption	No
Seat-belt installation for all seats	No
Types of new drivers assessment/test for driving licence	
Theoretical assessment/test	Yes
Practical assessment/test	Yes
Others (please specify)	No
Road safety audit	
Formal road safety audit required for major new road construction projects	No ⁱ
Regular audits of existing road infrastructure	No
Existing other measures to reduce exposure and prevent road traffic injuries	
National policies to promote walking or cycling	No ^j
National policy to promote public transportation	Yes

ⁱ Informal check is being done

^j Policy exists at provincial and municipal level

Post-crash care	
Formal publicity on available pre-hospital care system	Yes
Nation-wide universal access phone number for pre-hospital care	Yes ^k

^k Universal no. is 1669

Timor-Leste

Population: 1 154 775 (2007)

Income group: Middle

Gross national income per capita: \$ 1 510 (2008)

Institutional Framework	
Lead agency	National Directorate of Land Transport
Funded in national budget	Yes
National Road Safety Strategy	Multiple
Measurable targets	n/a
Funding	n/a

Magnitude of road traffic injury	
Reported number of road traffic deaths (2007)	46 ^a
Reported number of road traffic injuries (2007)	1 686 ^b
Costing study available	No
Estimated annual economic cost of road traffic injuries and/or deaths	n/a

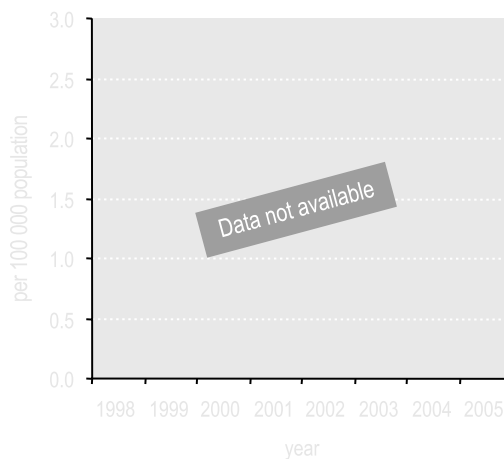
^a Police data, defined as died as a result of injuries sustained in crash.

^b Health data.

Deaths by road user categories, Timor-Leste



Trends in road traffic deaths, Timor-Leste



Registered vehicles	
Total number of registered vehicles	26 649 (2008) ^c
Motorcars	6%
Motorized 2 and 3-wheelers	72%
Minibuses, vans etc. (seating>20)	14%
Trucks	8%
Buses	0% ^d

^c As per National Directorate of Land Transport

^d Less than 1%

National legislation	
Speed limits set nationally	Yes
Maximum limit urban roads	50 km/h
Ability of local authorities to modify national speed limit	No
Enforcement of speed limit law ^e	① 1 2 3 4 5 6 7 8 9 10
Drink-driving law	Yes
BAC limit – general population	0.05 g/dl
BAC limit – young or novice driver	0.05 g/dl
Random breath testing and/or police check points	Yes
Road traffic mortality contributed by alcohol	-
Enforcement of drink-driving law ^e	① 1 2 3 4 5 6 7 8 9 10
Motorcycle helmet law	Yes
Applies to all riders	Yes
Helmet standards mandate	No
Helmet wearing rate at national level	50% ^f
Enforcement of motorcycle helmet use law ^e	0 1 2 3 4 ⑤ 6 7 8 9 10
Seat-belt law	Yes
Applies to all occupants	Yes
Seat-belt wearing rate at national level	5-10% ^g
Enforcement of seat-belt use law ^e	① 1 2 3 4 5 6 7 8 9 10
Child restraints law	Yes
Enforcement of seat-belt use law ^e	① 1 2 3 4 5 6 7 8 9 10

^e Enforcement score represents consensus based on professional opinion of respondents, on a scale of 0 to 10 where 0 is not effective and 10 is highly effective.

^f 70% drivers, 30% passengers, Group estimate, 2008.

^g Group estimate, 2008.

Vehicle standards	
No car manufacturer	
Types of new drivers assessment/test for driving licence	
Theoretical assessment/test	Yes
Practical assessment/test	Yes
Others (please specify)	No
Road safety audit	
Formal road safety audit required for major new road construction projects	Yes
Regular audits of existing road infrastructure	No
Existing other measures to reduce exposure and prevent road traffic injuries	
National policies to promote walking or cycling	No
National policy to promote public transportation	No
Post-crash care	
Formal publicity on available pre-hospital care system	Yes
Nation-wide universal access phone number for pre-hospital care	Yes ^h

ⁱ Universal no. is 110, another toll free number is 112

Road traffic injury is one of the fastest growing epidemics in the WHO South-East Asia Region. The Regional Report on Status of Road Safety: the South-East Asia Region provides an opportunity to depict the extent and scale of this particular problem. All Member countries of the WHO SEA Region except DPR Korea participated in the survey. The data used in the report were endorsed by the relevant government authorities of each country.

An estimated 288 768 people were killed on the roads of the South-East Asia Region in 2007. Almost three-quarters of all these deaths occur among the most vulnerable road-users, i.e. motorcyclists, pedestrians, and cyclists. This report also reaffirms our understating of the rapid proliferation of two- and three-wheelers in the Region, which is a major risk factor for road traffic injuries. All Member countries in the Region have lead agencies in place to address road traffic injuries but need more political commitment and support to reduce the huge toll of road traffic injuries.



**World Health
Organization**

Regional Office for South-East Asia
World Health House
Indraprastha Estate,
Mahatma Gandhi Marg,
New Delhi-110002, India
Website: www.searo.who.int

ISBN 978 92 9022 355 9

