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# Road safety in the Eastern Mediterranean Region – findings from the Global Road Safety Status Report

H. Soori,<sup>1</sup> S.J. Hussain<sup>2</sup> and J.A. Razzak<sup>3</sup>

## السلامة على الطرُق في إقليم شرق المتوسط – نتائج التقرير العالمي لحالة السلامة على الطرُق

حميد سوري، سيد جعفر حسين، جنيد رزاق

الخلاصة: أجري الباحثون تحليلاً ثانوياً للمعطيات الواردة في التقرير العالمي لحالة السلامة على الطرُق لتقييم وبائيات الإصابات على الطرُق المرورية والاستراتيجيات الوقائية في إقليم شرق المتوسط. وكان ترتيب بلدان إقليم شرق المتوسط هو الأول عالمياً من حيث عدد الوفيات الناتجة عن الإصابات على الطرُق المرورية (32.2 وفاة لكل مئة ألف من السكان). ويوجد في الإقليم حوالي 4٪ من المركبات في العالم، وهناك 0.097 مركبة مسجلة لكل فرد. وبلغ عدد حالات الإصابة في إقليم شرق المتوسط 210.1 لكل مئة ألف من السكان. ولم تقم سوى 15٪ من بلدان الإقليم بتمويل هيئة مستقلة ومتعددة القطاعات معنية بالسلامة على الطرُق. ولا توجد قوانين خاصة بالإلزام بتثبيت حزام المقعد للجالسين في المقاعد الأمامية والخلفية إلا في 25٪ فقط من البلدان، وهناك قوانين إجبارية لارتداء الخوذة لقائدي وراكبي الدراجات البخارية ذات العجلتين في 60٪ من البلدان، وهناك قوانين لإحكام ربط الأطفال في 10٪ من البلدان. وتحتاج السلامة على الطرُق للمزيد من الاهتمام والعناية.

ABSTRACT A secondary data analysis using the Global Status Report on Road Safety (GSRRS) was carried out to assess the epidemiology of road traffic injuries (RTIs) and preventive strategies in the Eastern Mediterranean Region (EMR). EMR countries ranked equal first in the world for the highest number of fatalities due to RTIs (32.2 per 100 000 population). The region had about 4% of the world's vehicles with 0.097 registered vehicles per person. The number of injured cases in EMR was 210.1 per 100 000 population. Only 15% of EMR countries had a funded, independent, multisectoral body for road safety. Only 25% had mandatory seat-belt laws for both front-seat and rear-seat passengers, 60% had mandatory helmet laws for both drivers and passengers of motorized two-wheelers and 10% had child restraint laws. Road safety in EMR countries needs more attention and consideration.

## Sécurité routière dans la Région de la Méditerranée orientale – résultats du Rapport de situation sur la sécurité routière dans le monde

RÉSUMÉ Une analyse des données secondaires extraites du Rapport de situation sur la sécurité routière dans le monde a été menée pour évaluer l'épidémiologie des traumatismes dus aux accidents de la circulation et les stratégies de prévention dans la Région de la Méditerranée orientale. Les pays de la Région sont ceux dans lesquels on constate le nombre le plus élevé au monde de décès causés par des traumatismes dus aux accidents de la circulation (32,2 pour 100 000 habitants). La Région possède environ 4 % des véhicules dans le monde avec 0,097 véhicule immatriculé par personne. Le nombre de cas de traumatismes en Méditerranée orientale est de 210,1 pour 100 000 habitants. Seuls 15 % des pays de la Région disposent d'un organisme en charge de la sécurité routière qui soit multisectoriel, indépendant et financé. Ils ne sont que 25 % à avoir promulgué une loi rendant obligatoire le port de la ceinture de sécurité à l'avant comme à l'arrière des véhicules ; 60 % des pays ont une législation sur le port obligatoire du casque pour les conducteurs comme pour les passagers de deux-roues motorisés et 10 % se sont dotés d'une loi sur les dispositifs de retenue pour enfants. Davantage d'attention et de considérations doivent être accordées à la sécurité routière dans la Région de la Méditerranée orientale

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## Introduction

Road traffic injuries (RTIs) are a serious public health problem in different regions of the world. More than 1.27 million people are killed each year due to road traffic crashes, and as many as 50 million are injured [1,2]. RTIs are the leading cause of death in 15–29-year-olds and result in disability for many victims. A recent study by the World Health Organization (WHO) estimated the incidence rate of fatal RTIs to be 32.2 per 100 000 in the WHO Eastern Mediterranean Region (EMR), compared to 13.4 per 100 000 in European Region and 18.8 per 100 000 worldwide [3].

More than 90% of deaths from RTIs occur in low- and middle-income countries, which only have 48% of the world's vehicles [1]. Around 94% of EMR residents live in low- and middle-income countries. According to the Global Status Report on Road Safety (GSRRS) about 62% of reported road traffic deaths occur in 10 countries of the world out of which 2 are in EMR. It is very important to take steps to address the global assessment of road safety, to have regular comparisons on a number of indicators between different years and countries, and present epidemiological data on RTIs for better policy-making as well as a more effective road traffic injury prevention plan [1].

The number of scientific reports on RTIs in EMR is limited compared to most of the developed countries and this paper aims to present the epidemiological pattern of RTIs in this region and compare the results for the EMR Member States and the global status of RTIs as a whole.

## Methods

This is a secondary data analysis study using data from the GSRRS [1] and other available data sources in the

region and international databases. EMR includes 22 countries (out of 195 member and associate member states of WHO): Afghanistan, Bahrain, Djibouti, Egypt, Islamic Republic of Iran, Iraq, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Palestine (West Bank and Gaza). The region has about 555 million inhabitants, about 8.5% of the world population [4]. Only 6.2% of this population live in high-income countries (HIC) while the remaining live in low- and middle-income countries. In EMR, all Member States, except Djibouti and Somalia, and 1 non-member area participated in the study. These 2 countries represent 1.7% of the total population of the whole region. Details on methodology of the original study are available in GSRRS.

In summary, the work on the report began in August 2007 with the specific objectives of:

- assessing the status of road safety in all WHO Member States;
- indicating the gaps in road safety to help countries identify the key priorities for intervention;
- stimulating road safety activities at a national level.

For the original study, a self-administered questionnaire was completed by each country using a national trained coordinator, who facilitated a consensus meeting involving a multisectoral group of 8 road safety experts. Data collection began in March 2008 and was completed in September 2008.

Reported number of deaths was adjusted for 30-day definition of a road traffic death and the modelled number of deaths calculated using negative binomial regression [5] to identify outliers and determine the extent of missing data. In many countries the level of severity of an injury was recorded by different organizations; however the

data on non-fatal injuries presented in this report was mainly gathered from the emergency departments of different countries.

Variables selected from GSRRS for this paper are: countries in EMR, number of deaths from RTIs, total population, number of registered vehicles, national legislations on speed limit, drink-driving law, motorcycle helmet law, seat-belt law, child restraint law, institutional framework and reported non-fatal RTIs.

Data was re-analysed using *Excel* 2007.

## Results

Type of vehicle and trends of mortality rates were not available for all countries and so are not presented here.

### Population and vehicles

Table 1 shows the total population and number of registered vehicles in 20 different countries of EMR. The total population of 20 countries recorded in this study (2007) was 545.5 million, estimated to be about 8.5% of world's population. Three countries, Egypt, Islamic Republic of Iran and Pakistan, contribute to 57% of the total population of the region (Table 1).

The total number of registered vehicles in the region was 52.74 million with 65.4% in the Islamic Republic of Iran, Saudi Arabia, Pakistan and Egypt (Table 1). The total number of vehicles in the region represents about 4% of the world total. About 62.0% of the vehicles are motor cars, 19.4% buses or mini-buses, 8.7% motorized 2- or 3-wheelers and 7.1% trucks. The proportion of registered vehicles per person in EMR is 0.097, while the figure for the rest of the world is 0.2.

### Mortality

In total, 175 668 deaths from RTIs were reported in the region for 2007, 32.2 per 100 000 population. High-

**Table 1 Total population and registered vehicles in 20 countries of the World Health Organization Eastern Mediterranean Region in 2007**

Country	Population		Total registered vehicles	
	No.	%	No.	%
Afghanistan	2 714 275	4.98	731 607	1.41
Bahrain	752 648	0.14	382 977	0.74
Egypt	75 497 913	13.84	4 300 000	8.28
Iran (Islamic Republic of)	71 208 384	13.05	17 000 000	32.72
Iraq	28 993 374	5.31	2 242 269	4.32
Jordan	5 924 245	1.09	841 933	1.62
Kuwait	2 851 144	0.52	1 364 790	2.63
Lebanon	4 099 115	0.75	1 400 000	2.69
Libyan Arab Jamahiriya	6 160 483	1.13	1 826 533	3.52
Morocco	31 224 137	5.72	2 284 060	4.39
Oman	2 595 133	0.48	629 670	1.21
Pakistan	163 902 405	30.04	5 287 152	10.17
Qatar	840 635	0.15	605 699	1.17
Saudi Arabia	2 473 453	4.53	7 398 600	14.24
Sudan	38 560 488	7.07	1 200 000	2.31
Syrian Arab Republic	19 928 516	3.65	1 389 346	2.67
Tunisia	10 327 285	1.89	1 244 918	2.39
United Arab Emirates	4 380 439	0.80	1 754 420	3.38
West Bank and Gaza	4 018 000 <sup>a</sup>	0.74	78 609	0.15
Yemen	22 389 169	6.03	777 734	1.50
Total	545 533 321	100	52 740 317	100

<sup>a</sup>2007 data not available; latest available used from <http://data.un.org/>.

income and middle-income countries of EMR have the highest death rate from RTIs in the world. These death rates were more than 3 and 2 times greater than the lowest rates in other high-income and middle-income countries of the world respectively (Table 2).

The RTI fatality rate in EMR is 6.4% of total global deaths from RTIs [1]. The Islamic Republic of Iran has the highest number of deaths from RTIs and is responsible for 14.5% of total deaths from all causes in the region. However, the highest rates of fatal RTIs (per 100 000 population)

are for Egypt (41.6%), Libyan Arab Jamahiriya (40.5%) and Afghanistan (39.0%) (Table 3). Fatal RTIs per 10 000 vehicles was 33.8. Table 3 gives more details of the actual and modelled number of deaths and modelled rates (per 100 000 population) in 20 countries of the region.

**Table 2 Modelled road traffic injury fatality rates (per 100 000 population)<sup>a</sup>, by World health Organization (WHO) Region and income group**

WHO Region	High-income	Middle-income	Low-income	Total
Eastern Mediterranean	28.5	35.8	27.5	32.2
African <sup>b</sup>	–	32.2	32.3	32.2
South-East Asian <sup>b</sup>	–	16.7	16.5	16.6
Americas <sup>c</sup>	13.4	17.3	–	15.8
Western Pacific	7.2	16.9	15.6	15.6
European	7.9	19.3	12.2	13.4
Global	10.3	19.5	21.5	18.8

<sup>a</sup>30-day definition

<sup>b</sup>No high-income countries

<sup>c</sup>No low-income countries

Source: Global status report on road safety [1].

**Table 3 Number and rate of road traffic deaths (per 100 000 population) in 20 countries of the World Health Organization Eastern Mediterranean Region**

Country	Reported number of deaths <sup>a</sup>	Modelled number of deaths <sup>b</sup>	Estimated road traffic death rate per 100 000 population <sup>b</sup>
Afghanistan	1 779	10 593	39.0
Bahrain	91	91	12.1
Egypt	15 983	31 439	41.6
Iran (Islamic Republic of)	22 918	25 491	35.8
Iraq	1 932	11 059	38.1
Jordan	992	2 027	34.2
Kuwait	482	482	16.9
Lebanon	536	1 170	28.5
Libyan Arab Jamahiriya	2 138	2 497	40.5
Morocco	3 838	8 850	28.3
Oman	798	553	21.3
Pakistan	7 234	41 494	25.3
Qatar	199	199	23.7
Saudi Arabia	6 358	7 166	29.0
Sudan	2 227	13 362	34.7
Syrian Arab Republic	3 663	6 552	32.9
Tunisia	1 497	3 568	34.5
United Arab Emirates	1 056	1 626	37.1
West Bank and Gaza	188	896	22.3
Yemen	3 003	6 553	29.3
Total	76 912	175 668	32.2

<sup>a</sup>Adjusted for 30-day definition of a road traffic death.

<sup>b</sup>Modelled using negative binomial regression ([http://www.who.int/violence\\_injury\\_prevention/road\\_safety\\_status/methodology/en/index.html](http://www.who.int/violence_injury_prevention/road_safety_status/methodology/en/index.html) for detailed methodology).

## Morbidity

The number of people injured in the region in 2007 was 1 145 958 which is 210.1 per 100 000 population. This equates to 220.5 per 10 000 vehicles in the region. The Islamic Republic of Iran with more than 962.8 per 100 000 population has the highest rate of non-fatal RTIs in the region. The highest rates of non-fatal injuries from RTIs per 10 000 registered vehicles are in Qatar, Pakistan and Iraq with 17.4, 24.6, 33.3 respectively. Table 4 gives details of non-fatal RTI rates per 100 000 population and per 10 000 vehicles in participating countries of EMR.

## Enforcement of laws and legislations

Table 5 shows the presence of certain important laws and legislations on

road safety in different countries of EMR.

Few countries in EMR (15%) have a funded, independent, multisectoral body for road safety. In EMR, 90% of the countries had a seat-belt law but only 25% had mandatory seat-belt laws for both front-seat and rear-seat passengers. The majority of countries (85%) have some form of helmet law for 2-wheelers vehicles but only about 60% have mandatory helmet laws for both rider and passenger. Only 10% of EMR countries have child restraint laws.

National speed limits in urban areas for vehicles in 20 countries of the region ranged from 50 km/h in many countries to 120 km/h. Oman (120 km/h), Iraq, Qatar and Lebanon (100 km/h) have the highest speed limits in urban areas.

Blood alcohol concentration over 0 g/dL is illegal for the general population for most of the countries in the region while it is 0.10 g/dL in the United Arab Emirates. There was no difference in blood alcohol concentration levels for the general population, young/novice drivers and professional/commercial drivers in all countries. Except in Morocco, all other countries have national drink-driving laws and in some countries alcohol consumption is prohibited. The methods used for enforcing drink-driving laws are mostly through measurement of blood alcohol concentration and by random breath testing by police check-points in 8 countries (Afghanistan, Islamic Republic of Iran, Kuwait, Lebanon, Oman, Pakistan, Tunisia and United Arab Emirates).

**Table 4 Non-fatal road traffic injuries in participating countries of the World Health Organization Eastern Mediterranean Region**

Country	Number of reported cases	Rate per 100 000 population	Rate per 10 000 vehicles
Afghanistan	16 980	62.6	232.1
Bahrain	3 415	453.7	89.2
Egypt	154 000	204.0	358.1
Iran (Islamic Republic)	685 611	962.8	403.3
Iraq	7 467	25.8	33.3
Jordan	17 969	303.3	213.4
Kuwait	8 584	301.1	62.9
Lebanon	6 266	152.9	44.8
Libyan Arab Jamahiriya	9 524	154.6	52.1
Morocco	89 264	285.9	390.8
Oman	8 531	328.7	135.5
Pakistan	12 990	7.9	24.6
Qatar	1 053	125.3	17.4
Saudi Arabia	36 025	145.6	48.7
Sudan	21 329	55.3	177.7
Syrian Arab Republic	16 145	81.0	116.2
Tunisia	14 559	141.0	116.9
United Arab Emirates	11 155	254.7	63.6
West Bank and Gaza	5 838	145.3	742.7
Yemen	19 253	86.0	247.6
Total	1 145 958	210.1	220.5

## Discussion

In 2007 in EMR, there were 32.2 RTI deaths per 100 000 population. While this was the same as the African region, it was much higher than the 13.4 per 100 000 in the European region. Indeed, only 2 countries of EMR (Bahrain and Kuwait) had lower death rates from RTIs than the world estimate of 18.8 per 100 000. EMR ranked second after the African region for fatal RTIs per vehicle; 87.3 per 10 000 vehicles for the African region versus 33.8 for EMR. The figure is 3.2 per 10 000 vehicles for the European region and 9.3 per 10 000 vehicles for the world.

The number of people injured in the region in 2007 was 1 145 958 (210.1 per 100 000 population) which is lower than the 269.3 per 100 000 reported in the European region.

Few countries in EMR (15%) had a funded, independent, multisectoral body for road safety while this figure

was about 74% in the European region. In addition, only 25% of EMR countries had mandatory seat-belt laws for both front-seat and rear-seat passengers compared to about 92% in the European region, and only 60% had mandatory helmet laws for both rider and passenger compared to 98% in the European region. In fact, only the Islamic Republic of Iran, Sudan and Tunisia meet the recognized helmet standards. Only 10% of EMR countries had laws in place on restraint of children in cars compared to 86% in European region.

This study shows that EMR has one of the worst road safety situations in the world. The fatality rate per 100 000 population ranked first equal (with the African region), While injuries per 100 000 population were lower, the validity and reliability of the data on non-fatal RTIs derived from secondary data set is open to question [6]. In many countries, non-fatal injuries from RTIs are recorded by police at the

site of the crash, whereas in some less severe injuries are either not recorded and/or a standardized scoring method for injury severity is not used. Thus, there may in fact be an under-reporting of non-fatal injuries. As a result, data on non-fatal injuries on RTIs are not comparable between different countries of the region and rest of the world.

Injuries apart, the high fatality rate compared with Europe raises the question of response to road traffic crashes, the facilities available to deal with RTIs, access to care and the quality of medical care received. In middle- and low-income countries, adequate capacity may be limited.

Our study shows that some driving safety laws are in place but they are not as far-reaching as those in the European region. In addition, laws need to be enforced but our study could not determine how well the current laws were being implemented.

This is the first report on road safety in EMR that shows an overall picture

**Table 5 Some measures on laws and legislations in different countries of the World Health Organization Eastern Mediterranean Region**

Country	National drink-driving law	Random breath testing or police check-points	Helmet law	Seat-belt law	Child restraint law
Afghanistan	Yes <sup>a</sup>	Yes	No	No	No
Bahrain	Yes <sup>a</sup>	No	Yes	Yes	No
Egypt	Yes	No	Yes	Yes	No
Iran (Islamic Republic)	Yes <sup>a</sup>	Yes	Yes	Yes	No
Iraq	Yes	No	No	Yes	No
Jordan	Yes	-	Yes	Yes	No
Kuwait	Yes <sup>a</sup>	Yes	Yes	Yes	No
Lebanon	Yes	Yes	Yes	Yes	No
Libyan Arab Jamahiriya	Yes <sup>a</sup>	No	Yes	Yes	No
Morocco	No	-	Yes	Yes	No
Oman	Yes	Yes	Yes	Yes	No
Pakistan	Yes <sup>a</sup>	Yes	Yes	Yes	No
Qatar	Yes	No	Yes	Yes	No
Saudi Arabia	Yes	No	Yes	Yes	Yes
Sudan	Yes <sup>a</sup>	No	Yes	Yes	No
Syria	Yes	No	Yes	Yes	No
Tunisia	Yes	Yes	Yes	Yes	No
United Arab Emirates	Yes	Yes	Yes	Yes	No
West Bank and Gaza	Yes	No	Yes	Yes	Yes
Yemen	Yes <sup>a</sup>	-	No	No	No

<sup>a</sup>Alcohol is prohibited [1].

of RTIs in 20 member countries of the region. Published studies from different EMR countries are limited. A comprehensive review in Safetylit [7] showed that there were only 138 papers on RTIs from member countries of EMR published in international scientific journals from 1966 to September 2008. More than 71% of these papers were from Saudi Arabia (31), Islamic Republic of Iran (23), Pakistan (26) and United Arab Emirates (18); there were no published studies on RTIs for 4 member countries.

Findings from this report show some similarities and some differences from the literature published from studies in the region. Most studies in different countries of the region show RTIs as a major cause of death in those countries [8–17]. For example, a higher frequency of RTIs in the Islamic Republic of Iran, Pakistan and Saudi Arabia has been reported [6,10,16]. However, the scope

of the problem of high rates of RTIs per 100 000 population in Egypt, Libyan Arab Jamahiriya and Afghanistan has not been well documented.

Although 12 of the countries in the region reported that they had a lead agency on road safety, only 3 countries that had a funded national strategy with measurable targets and so the data available were limited to basic road safety management.

Interventions, particularly the enforcement of laws and legislation and obligatory rules for use of seat-belts by drivers and car occupants, wearing of helmet by motorcyclists and educational programmes, can be effective in RTI prevention and in lowering the RTI rates [18,19]. Such interventions should be strictly implemented in different parts of the region. In addition, more reliable evidence is needed to determine the scope of different types of injuries and to evaluate the

interventions already implemented. While some countries in the region have taken steps towards addressing road safety, additional efforts are needed. Some studies show that despite increasing numbers of cars, there is a lack of significant environmental modifications for road and vehicle safety promotion [1].

In conclusion, RTIs are a serious problem in EMR with one of the highest fatality rates in the world. Researchers in the region are encouraged to study the scope of the problem, risk factors, interventions and evaluation of road traffic injuries in their own countries as well as the region. Stronger leadership from the lead agency and adequate resources and support for infrastructure are required and that the health sector should take a more active role in RTI prevention. In addition, policy-makers need to endorse proven interventions and their implementation.

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