



Semey State Medical University, Kazakhstan
Ritsumeikan Asia Pacific University, Japan
Ritsumeikan Center for Asia Pacific Studies (RCAPS)



Road traffic mortality in Semey area, Kazakhstan: it's time for action

Presentation for RCAPS
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KAZAKHSTAN

0 km 120 240 360 km

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RUSSIAN FEDERATION



- National Capital (3 100,000 h. 2000)
- over 1,000,000
- over 300,000
- over 100,000
- other main city
- other city



Semey State Medical University was founded in 1953.

4151 undergraduate students,

103 graduate and 10 PhD students.

Staff 434, including 40 doctors of medical sciences, 176 candidates of medical sciences, 29 masters.

Medical Center for 535 in-patients.

Rakhyrbekov Tolebay,
rector, professor, doctor of
medical science.



History of problem



1885



Karl Benz in 1885



Ford Model T, 1927, regarded as the first affordable American automobile



2011



1950s

72 000 000

1960s

125 000 000

1970

250 000 000

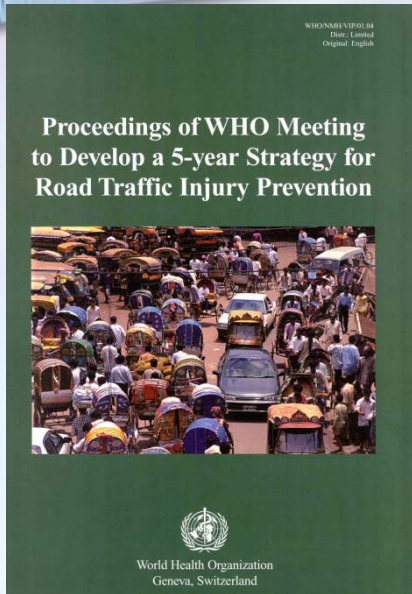
1986

500 000 000

2011

1 000 000 000





■ 2001 WHO Geneva

■ 2009 WHO Geneva

UN Decade of Action for Road Safety 2011-2020



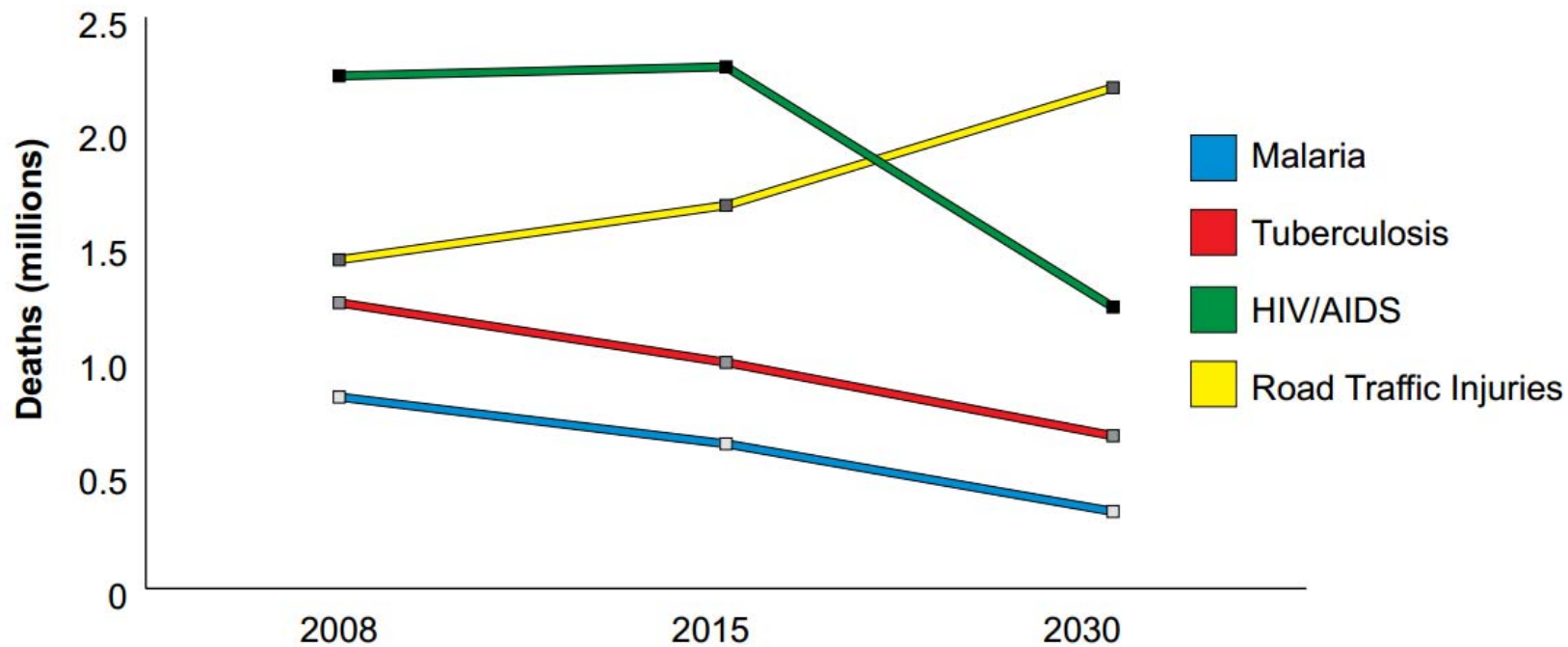
Number of deaths for leading causes by age group in the WHO European and Western Pacific regions, 2004

Rank	0-4 years	5-14 years	15-29 years	30-44 years	45-69 years	70+ years	Total
1	Perinatal causes 87 500	Road traffic injuries 4180	Road traffic injuries 39 300	Ischaemic heart disease 56 900	Ischaemic heart disease 679 400	Ischaemic heart disease 1 554 600	Ischaemic heart disease 2 295 600
2	Lower respiratory infections 34 500	Drowning 2430	Self-inflicted injuries 29 500	Self-inflicted injuries 41 000	Cerebrovascular disease 314 900	Cerebrovascular disease 1 020 200	Cerebrovascular disease 1 363 600
3	Diarrhoeal diseases 32 400	Lower respiratory infections 1930	Violence 14 900	Poisoning 33 600	Trachea, bronchus, lung cancer 190 900	Chronic obstructive pulmonary disease 176 300	Trachea, bronchus, lung cancer 370 700
4	Congenital anomalies 25 800	Leukaemia 1680	Poisoning 14 100	Road traffic injuries 33 200	Cirrhosis of the liver 112 400	Trachea, bronchus, lung cancer 168 900	Colon and rectum cancer 238 100
5	Meningitis 5360	Congenital anomalies 1390	HIV/AIDS 7010	Tuberculosis 28 900	Colon and rectum cancer 83 500	Colon and rectum cancer 148 300	Lower respiratory infections 234 700

	0-4	5-14	15-29	30-44	45-69	70+	Total
1	Perinatal causes	Drownings	Road traffic injuries	Road traffic injuries	Cerebrovascular disease	Cerebrovascular disease	Cerebrovascular disease
2	Diarrhoeal diseases	Road traffic injuries	Self-inflicted injuries	Self-inflicted injuries	Chronic obstructive pulmonary disease	Chronic obstructive pulmonary disease	Chronic obstructive pulmonary disease
3	Lower respiratory infections	Lower respiratory infections	Drownings	Tuberculosis	Ischaemic heart disease	Ischaemic heart disease	Ischaemic heart disease
4	Congenital anomalies	Leukaemia	Tuberculosis	Cerebrovascular disease	Trachea, bronchus, lung cancers	Lower respiratory infections	Lower respiratory infections
5	Drownings	Congenital anomalies	Violence	Liver cancer	Stomach cancer	Trachea, bronchus, lung cancers	Trachea, bronchus, lung cancers



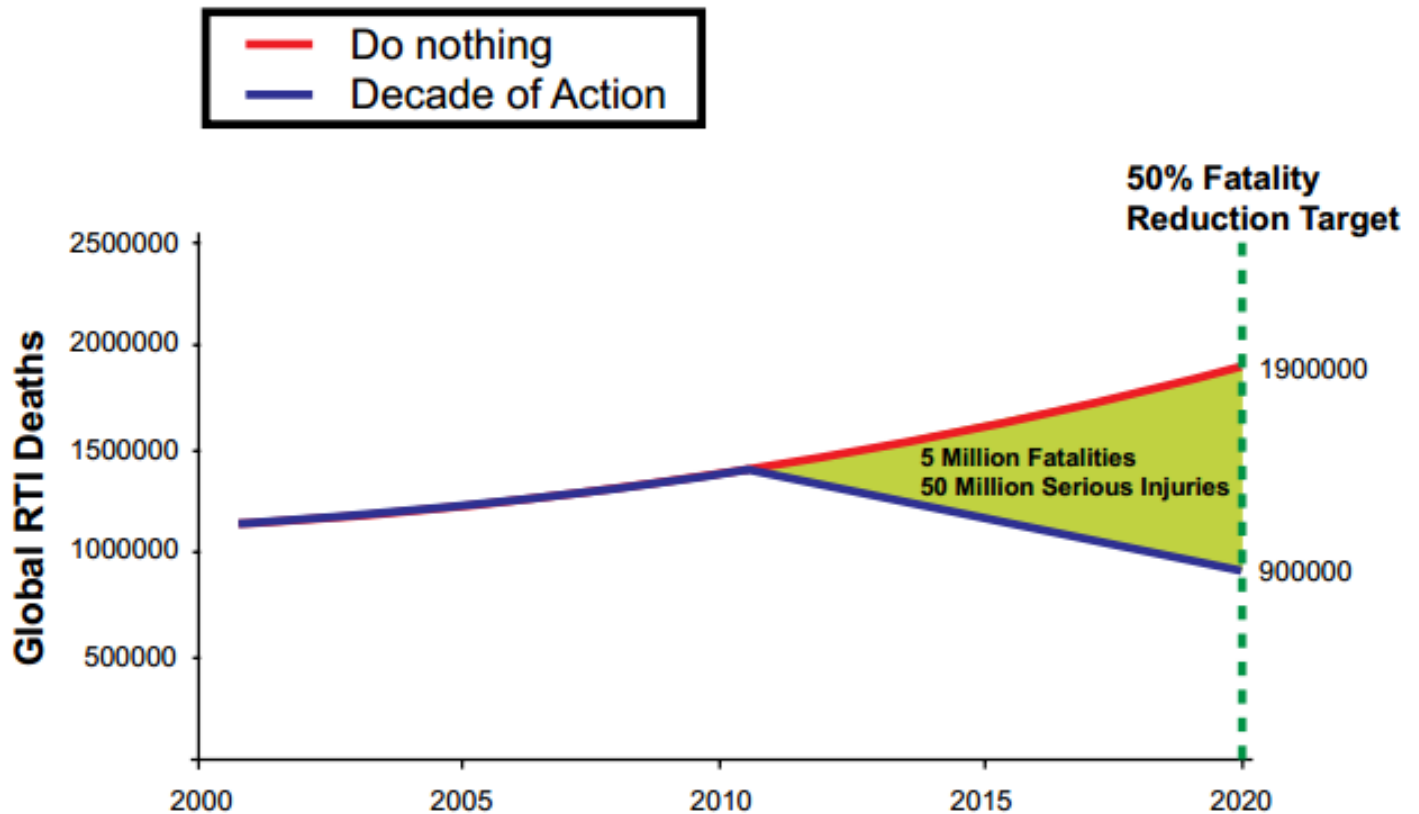
FIGURE 1: GLOBAL KILLERS: PROJECTIONS OF GLOBAL MORTALITY (ALL AGES) TO 2030



Source: Global Burden of Disease, 2008 WHO



FIGURE 3: CHANGING DIRECTION: POTENTIAL OF A DECADE OF ACTION FOR ROAD SAFETY

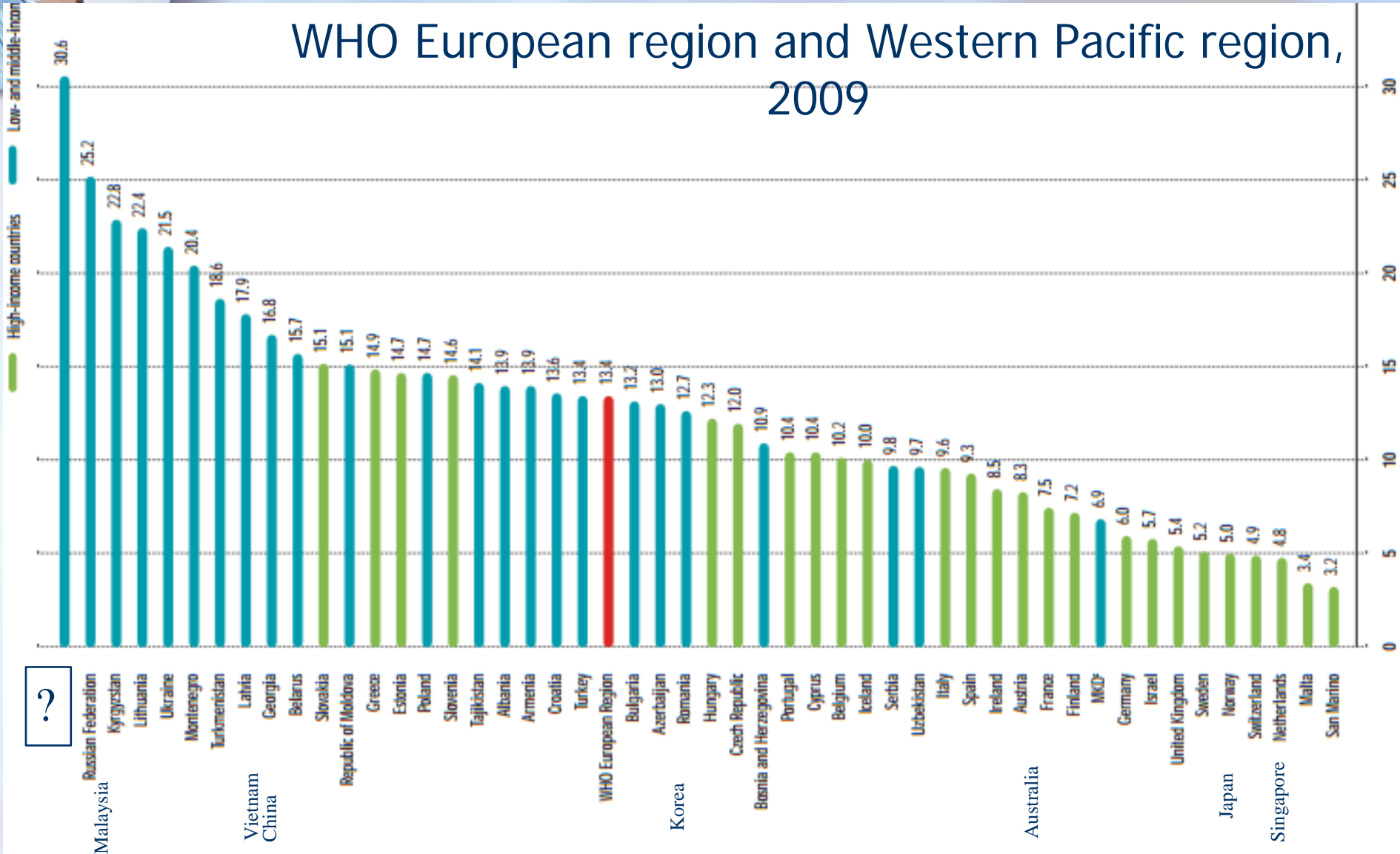


Source: Guria, J (2009)



Mortality rates from road traffic injuries per 100 000 population,

WHO European region and Western Pacific region, 2009





Ph.D. research topic:

Medical and organizational aspects of
improving health care for road traffic
accident victims in Semey area,
Kazakhstan



Penalty points system (PPS)

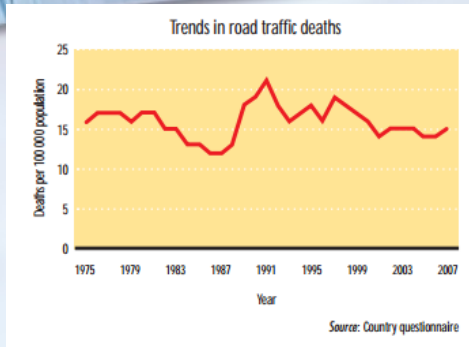
- in addition to Road Traffic Law
- fine + penalty point



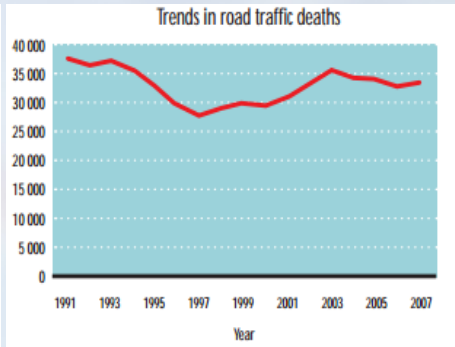
Trends in road traffic death (MIC and LIC)

Europe

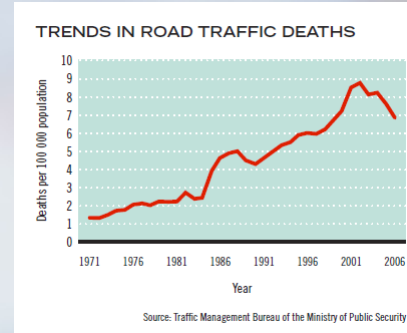
Western Pacific region



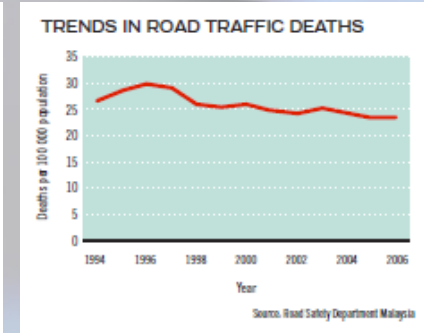
Poland



Russian Federation



China

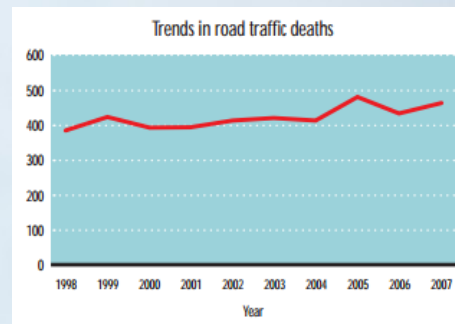


Malaysia

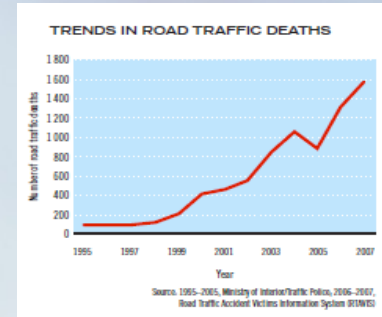
Trends in road traffic deaths

YEAR	NUMBER OF DEATHS
2006	1 051
2007	1 252

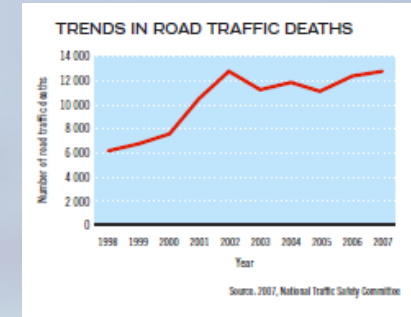
Kyrgyzstan



Tajikistan



Cambodia



Vietnam



Penalty points system

- Australia, 1992 - 34.4%
- Brazil, 1998 - 24.7%
- Greece, 2000-1 - 8.3%
- Italy, June 2003 - 7-18%
- Spain, 1 July 2006 - 14.5%

Trends in road traffic death (HIC)



Europe

Western Pacific region

Japan

France

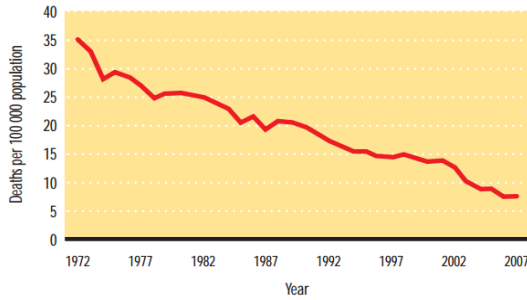
Germany

Sweden

Australia

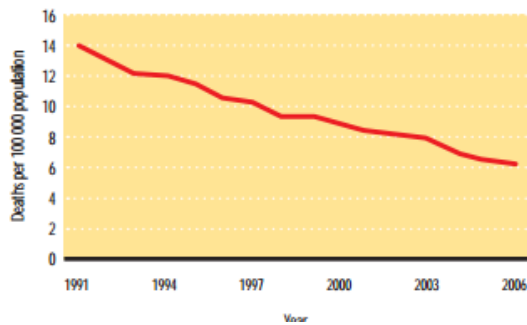
Korea

Trends in road traffic deaths

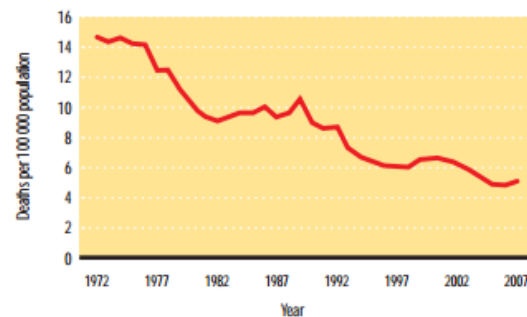


Source: Observatoire national interministériel de sécurité routière (ONISR)

Trends in road traffic deaths

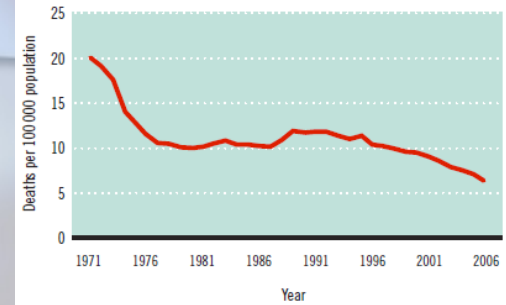


Trends in road traffic deaths



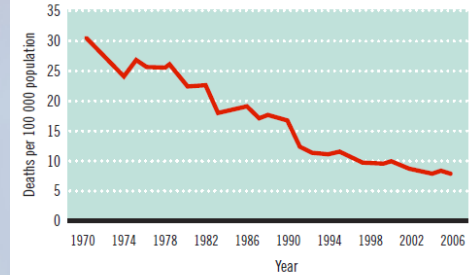
Source: Road Traffic Injuries 2007 (Vägfrafikskador 2007), Swedish Institute for Transport and Communication Analyses

TRENDS IN ROAD TRAFFIC DEATHS



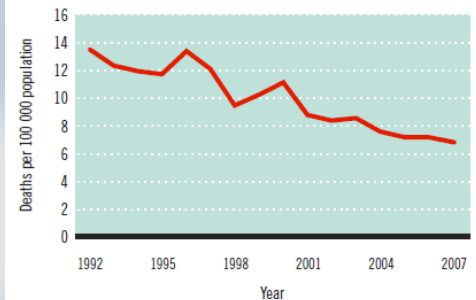
Source: Vital Statistics compiled by Ministry of Health, Labor and Welfare

TRENDS IN ROAD TRAFFIC DEATHS



Source: 2008, Department of Infrastructure, Transport, Regional Development and Local Government

TRENDS IN ROAD TRAFFIC DEATHS



Source: Road Traffic Authority



Trends in road traffic death in Kazakhstan

Trends in road traffic deaths



Kazakhstan*

Population: 15.42 million (2007)
 Median age: 29 years
 Life expectancy at birth: 64 years
 Income group²: middle
 Gross national income per person: 1759 5060 Rank: 34 of 49
 Human Development Index³: 0.807 Rank: 35 of 49
 Private car ownership per 1000 population⁴: 157.2
 CO₂ emissions (tonnes) per person per year⁵: 13.3

* Data for Kazakhstan is compiled by National Data Coordinator (on countries monitoring).
¹ World Bank data.
² Based among the 49 countries in the WHO European Region participating in the survey.
³ United Nations Development Programme data.
⁴ WHO European Region average: 221.

Institutional framework for road safety

Lead agency: Road Police Department	
Status of the agency	Government
Funded in national budget	Yes
National road safety strategy	Yes
Measurable targets	No
Implementation funded	Yes
Money allocated (in € (year))	No information

Key data

Reported number of road traffic deaths (2007)	4365 ¹ (78% males, 22% females)
Reported number of non-fatal road traffic injuries (2007)	32 988 ²
Road traffic deaths involving alcohol	3.2% ³
Wearing motorcycle helmets	No information
Using seat-belts in cars	
Overall	No information
Front-seat occupants	No information
Rear-seat occupants	No information
Costing study available	No information
Annual estimated costs (in € (year))	NA
Study included deaths, injuries or both	NA
Methods used	NA

¹ Ministry of Internal Affairs, Health Ministry and Statistics Agency, defined as dead within 7 days of the crash.
² Health data.
³ WHO, Ministry of Internal Affairs.

NA: not applicable

Trends in road traffic deaths



Age-specific mortality rates from road traffic injuries



Deaths by road user category



Source: 2007, Ministry of Internal Affairs

European status report on road safety

Towards safer roads and healthier transport choices





Republic of Kazakhstan

- Aug 1, 2008 - PPS in Kazakhstan.

- Procedures:
 - 1st offense - a fine;
 - 2nd offense - a fine + test of knowledge of traffic rules;
 - 3rd offense - deprivation of driving license.



PPS in Kazakhstan

2008, 1 Aug

- 1. Seat belt
- 2. Pedestrian crosswalk ("Zebra")
- 3. Speed limit
- 4. Alcohol, drug while driving
- 5. Cell phone

Also, except for penalties and possible arrest of the offender for up to 15 days.

Planned to reduce mortality by 10-15%



Published data

The main parameters affecting the deaths and injuries in road accidents:

- seat belts,
- alcohol-impaired driving,
- speed and red-light cameras,
- pedestrian and crosswalk,
- mixed and the other types of programs,
- fines,



Impact of Random Breath Testing to RTA fatalities

- Reduction by 19% in fatal accidents with post-intervention period 12 months,
 - 35% in fatal accidents at 49 months after implementation,
 - 28% after 51 months,
 - no long-term impact on fatal accidents after 120 months
-
- Booze buses effects: Reduction of 18% in severe accidents 12-42 months



Impact of sobriety checkpoints

Reduction of 20.4-26% after 21 months



Impact of speed control by speed and red-light cameras

- Total reduction of 35-55.7% in fatal accidents (24 to 36 months).
- Hidden speed cameras - 19%
- On roads cameras - 31%
- Speed cameras and pedestrians - 56% at 24 months after implementation

- Each 1 km/h reduction in the average speed leads to a 12% reduction in fatal and serious accidents



Impact of mixed programs and the other types of programs

from 8.3% at 12 months to 34.3% at 48 months



Impact of fines

- In the month after a conviction - 35% lower.
- The benefit lessened substantially by 2 months and was not significant by 3–4 months

Impact of media effect

- 14% in severe accidents



Research question:

- The enforcement of PPS in Semey area **reduced** mortality by $>10\%$

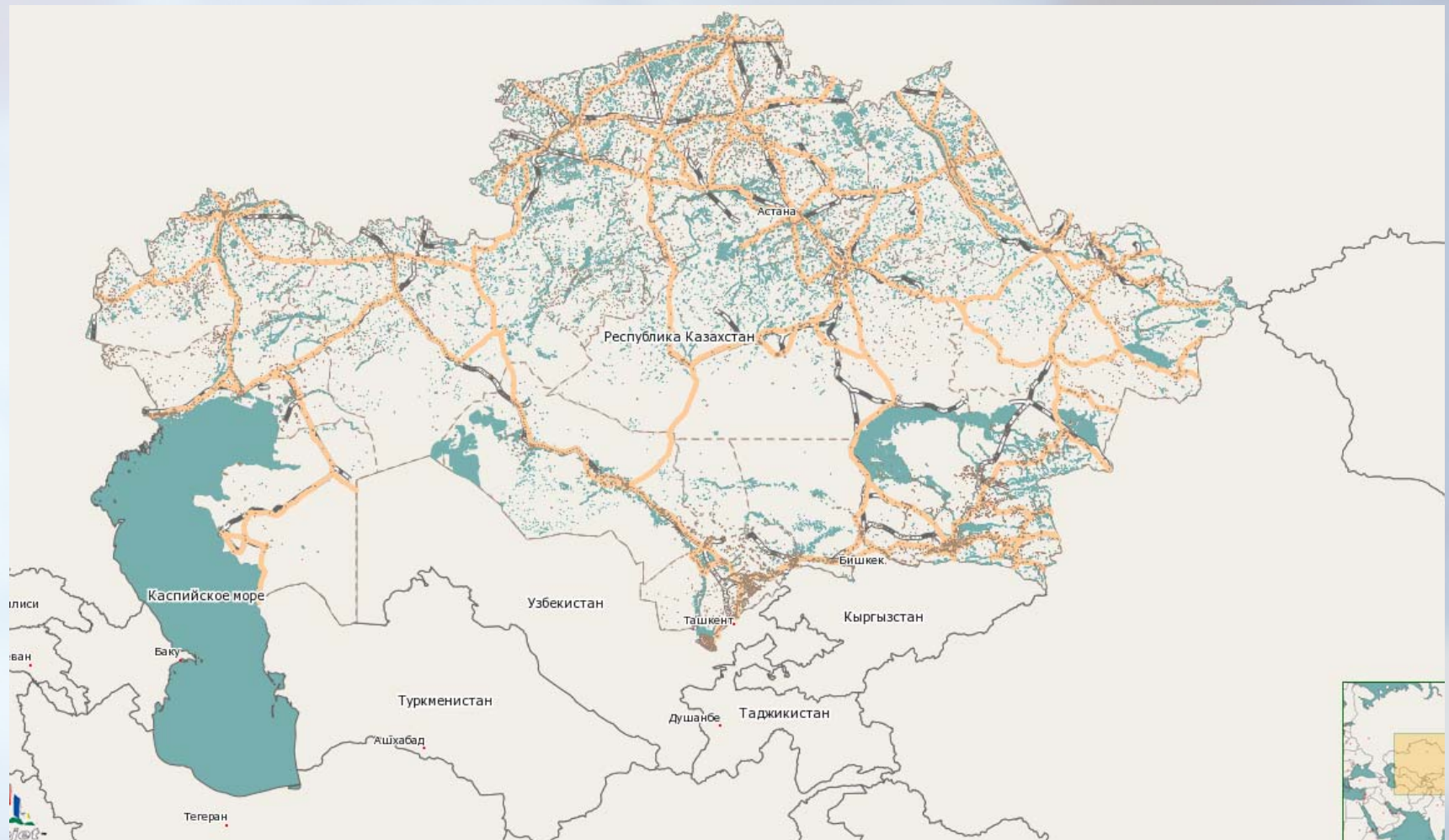


Materials and Methods: location





Materials and Methods: location



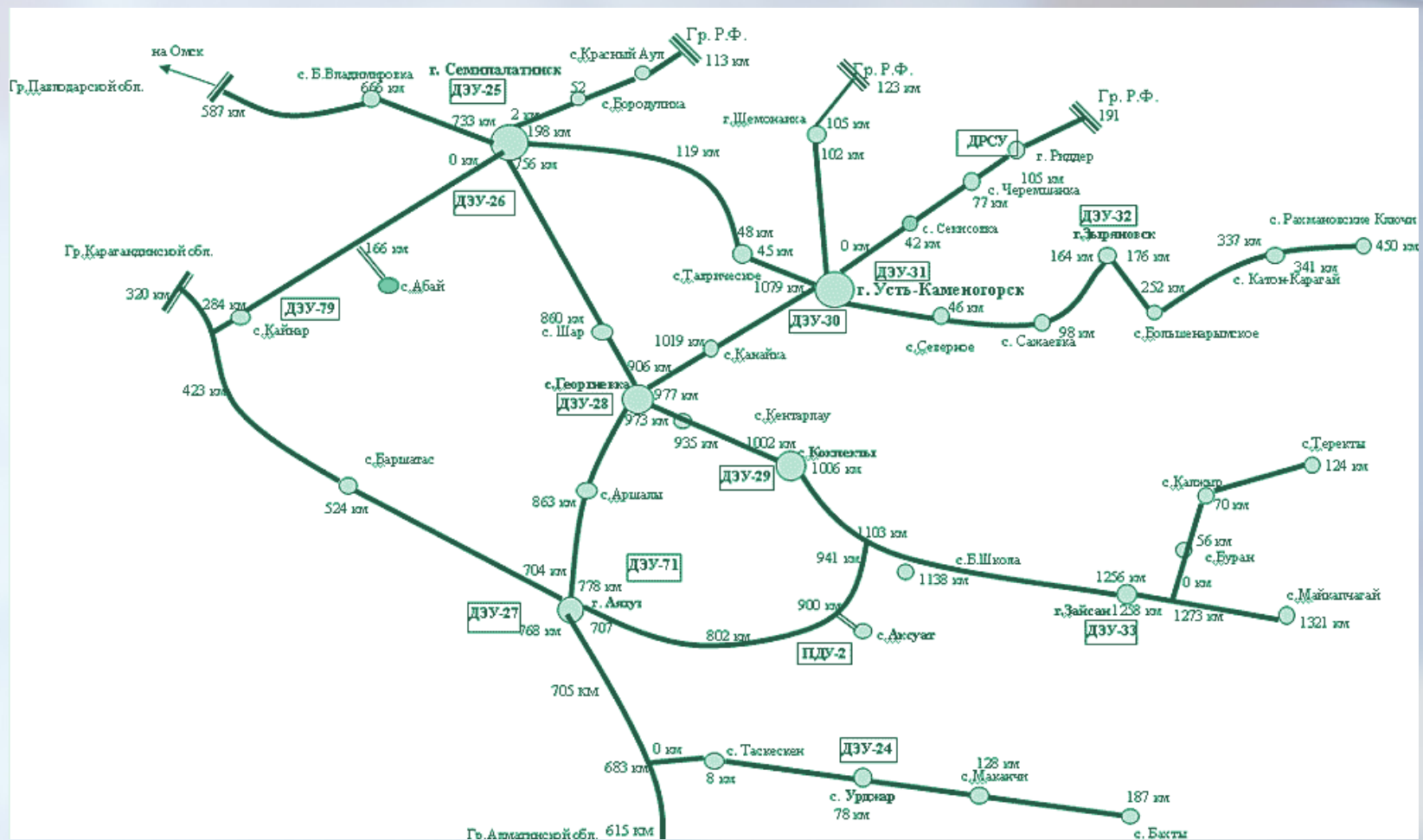


Materials and Methods: location





Materials and Methods: location

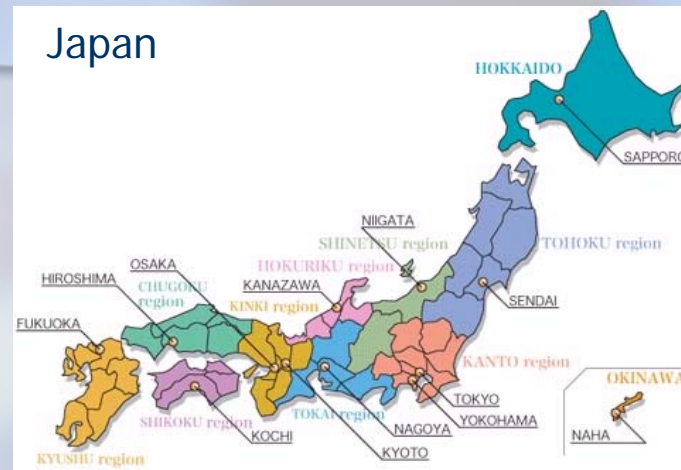




Materials and Methods: location



- 139 300 km²
- 526 133 people (2006-2010)



- 374 744 km²
- 127 078 679 people (2009)

- Territory 37.2%
- Population 0.4%

Materials and Methods:



- **Design:** a descriptive retrospective cross sectional study.
- **Database:** autopsy protocol of road traffic death case from Semey Center for Forensic medicine.
 - Total 318 death cases
 - 1 January 2006 – 31 December 2007 = I period.
 - 1 January 2008 – 31 December 2010 = II period.
- **Parameters:** age, gender, seasonality of fatal RTA, alcohol intoxication, type of road users, cause of death, place of death.

Mode of accident fatalities:

- Class 1 – pedestrian and cyclist
- Class 2 – motorcycle, scooter
- Class 3 - car, vans, suv, minibuses,



- Class 4 – lorry, truck, bus, tractor and other special vehicles



- Class 5 – compression between vehicles or vehicle and something, moving over the human body.



Future research:

- Pedestrian and crosswalk (zebra) with or without traffic light,
- Pedestrian behavior during road crossing,
- Circumstance and injuries of Class 1 and Class 3 fatalities,
- Drivers' knowledge and skills about first aid.



Take care of yourself!

Thank you for attention!

Ayan MYSSAYEV
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