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

Ayan MYSSAYEV
MD, PhD student
Assistant professor
Orthopedic and preventive medicine department
Semey State Medical University, Kazakhstan

Presentation for RCAPS
July, 20th 2012
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.

Rakhypbekov Tolebay, rector, professor, doctor of medical science.
History of problem

1885
Ford Model T, 1927, regarded as the first affordable American automobile

1950s 72 000 000
1960s 125 000 000
1970 250 000 000
1986 500 000 000
2011 1 000 000 000

Karl Benz in 1885

2011

1885 1927 2011
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

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

<table>
<thead>
<tr>
<th>Age Group</th>
<th>0-4</th>
<th>5-14</th>
<th>15-29</th>
<th>30-44</th>
<th>45-69</th>
<th>70+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perinatal causes</td>
<td>Drownings</td>
<td>Road traffic injuries</td>
<td>Road traffic injuries</td>
<td>Cerebrovascular disease</td>
<td>Cerebrovascular disease</td>
<td>Cerebrovascular disease</td>
<td>Cerebrovascular disease</td>
</tr>
<tr>
<td>Diarrhoeal diseases</td>
<td>Road traffic injuries</td>
<td>Self-inflicted injuries</td>
<td>Self-inflicted injuries</td>
<td>Chronic obstructive pulmonary disease</td>
<td>Chronic obstructive pulmonary disease</td>
<td>Chronic obstructive pulmonary disease</td>
<td>Chronic obstructive pulmonary disease</td>
</tr>
<tr>
<td>Lower respiratory infections</td>
<td>Lower respiratory infections</td>
<td>Drownings</td>
<td>Tuberculosis</td>
<td>Ischaemic heart disease</td>
<td>Ischaemic heart disease</td>
<td>Ischaemic heart disease</td>
<td>Ischaemic heart disease</td>
</tr>
<tr>
<td>Congenital anomalies</td>
<td>Leukaemia</td>
<td>Tuberculosis</td>
<td>Cerebrovascular disease</td>
<td>Trachea, bronchus, lung cancers</td>
<td>Lower respiratory infections</td>
<td>Lower respiratory infections</td>
<td>Lower respiratory infections</td>
</tr>
<tr>
<td>Drownings</td>
<td>Congenital anomalies</td>
<td>Violence</td>
<td>Liver cancer</td>
<td>Stomach cancer</td>
<td>Trachea, bronchus, lung cancers</td>
<td>Trachea, bronchus, lung cancers</td>
<td>Trachea, bronchus, lung cancers</td>
</tr>
</tbody>
</table>
FIGURE 1: GLOBAL KILLERS: PROJECTIONS OF GLOBAL MORTALITY (ALL AGES) TO 2030

- Malaria
- Tuberculosis
- HIV/AIDS
- Road Traffic Injuries

Deaths (millions)

Source: Global Burden of Disease, 2008 WHO
FIGURE 3: CHANGING DIRECTION: POTENTIAL OF A DECADE OF ACTION FOR ROAD SAFETY

- Do nothing
- Decade of Action

Global RTI Deaths

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
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
- France
- Germany
- Sweden

Western Pacific region
- Japan
- Australia
- Korea

Source: Various national and international statistics.
Aug 1, 2008 - PPS in Kazakhstan.

Procedures:

- 1\textsuperscript{st} offense - a fine;
- 2\textsuperscript{nd} offense - a fine + test of knowledge of traffic rules;
- 3\textsuperscript{rd} 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%
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

- **Semey area**
  - 139 300 km²
  - 526 133 people (2006-2010)

- **Japan**
  - 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

- **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
amyssaev@mail.ru