Traffic injuries in children and adolescents in Lithuania: Mortality trends by road users

Serpil Uğur Baysal ,MD
Professor of Pediatrics
Division of Social Pediatrics
Dokuz Eylül University, İzmir, Turkey
Serpil.baysal@deu.edu.tr

Greetings from Dokuz Eylul University,
Div. Social Pediatrics, İzmir, Turkey

Introduction

- **Nearly 2300 children die every day as a result of an unintentional injury.**
- **It is difficult to obtain reliable estimates of the scale and pattern of childhood injuries and deaths. Few countries have good data on childhood injuries.**

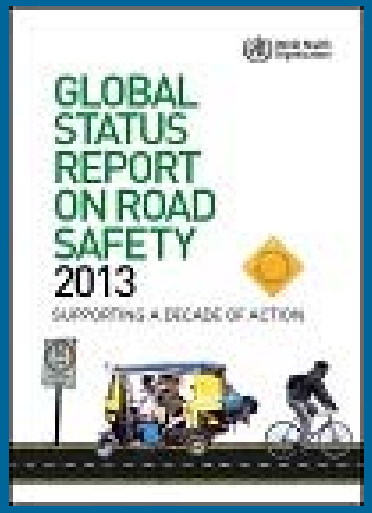
Introduction

- **Road trauma kils 260,000 children a year and injures approximately 10 million.**
- **It is the leading cause of death among 10-19(5-19) years old and is a leading cause of child disability(1,2)**

1. *Hughes G. Children's injuries: a global problem(Editorial) Emerg Med J 2009;26:236.*
2. *World Health Organization. Violence and injury prevention and disability(VIP). December 2008.*

Introduction

- **Global Status Report on Road Safety 2013** presents information on road safety from 182 countries and serves as a baseline for the Decade of Action for Road Safety 2011-2020.



Policies relating to risk factors

- Low and middle-income countries have higher road traffic fatality rates than those in high-income countries.

- However, less than 35% of those countries have policies covering one or more of important risk factors: Speed, drink- driving, helmets, seat belts, child restraints to protect road users (3-5).

  28 countries (7 % population)

References

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Copenhagen: WHO Regional Office for Europe; 2008.

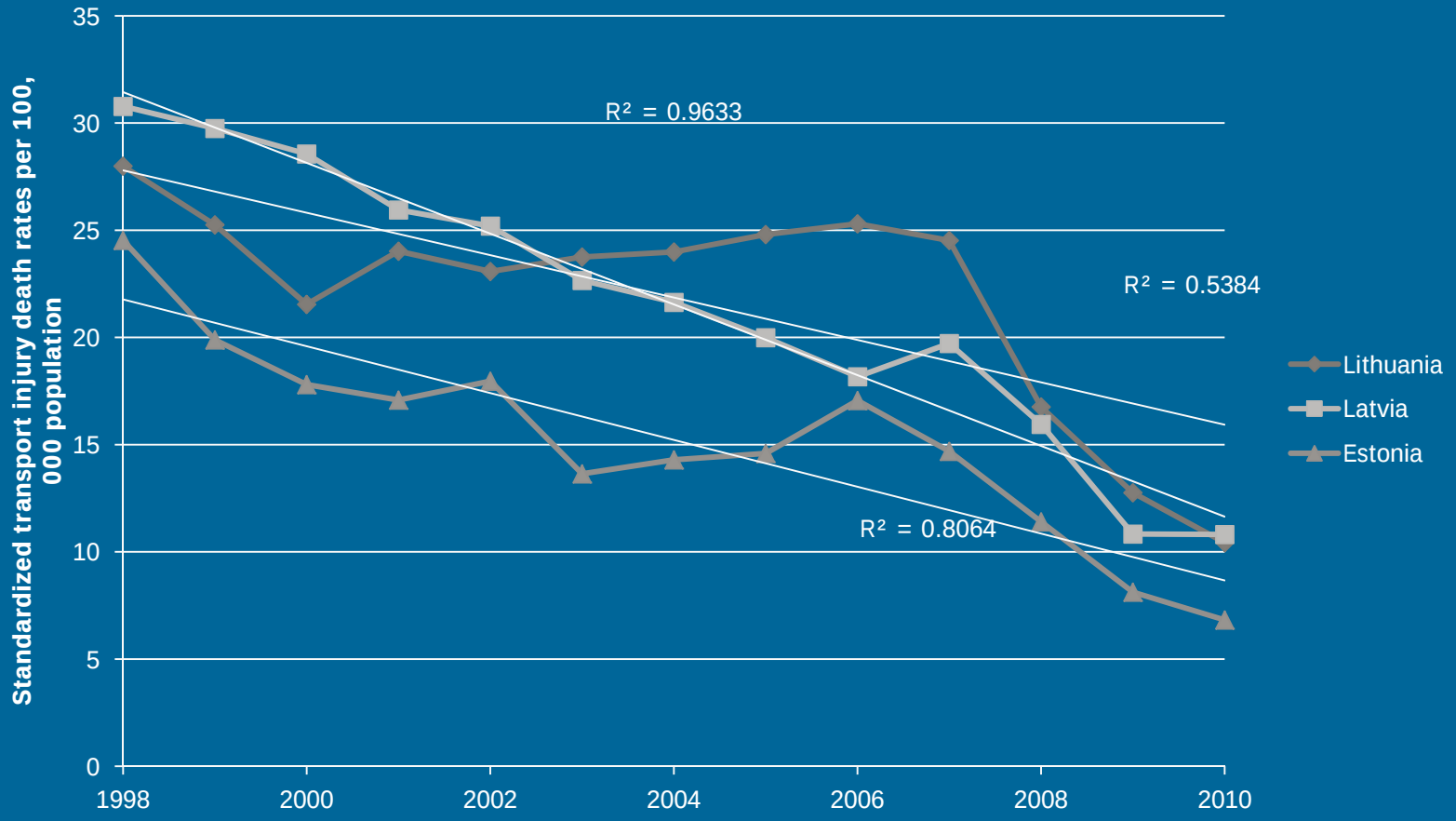
4. Road Safety. WHO, Global Health Observatory. http://www.who.int/gho/road_safety/en/index.html . Accessed on 29 June 2012.

5. WHO. Global status report on road safety 2013: Supporting a decade of action. Geneva: World Health Organization;2013. http://www.who.int/violence_injury_prevention/road_safety_status/2013/report/en/index.html

Vulnerable road users

- **In 2012, 28,000 people died on European Union (EU) roads.**
- In the whole EU population, one-third of fatal transport injury victims are vulnerable road users**.**
- **Children, pedestrians, cyclists and the elderly are among the most vulnerable of road users.**

Figure 1. Standardized transport injury death rates per 100,000 population.(Data from the source: European mortality database (MDB). World Health Organization, Regional Office for Europe. http://data.euro.who.int/hfambd/)



Objective

- The purpose of the study was to analyze trends in road traffic injury mortality in children and adolescents aged 0-19 years by road users in Lithuania.

- ***Key words: traffic injury, mortality trends, children, adolescents, road safety.***

Material and Methods

- Data on road traffic injury deaths were obtained from the Department of Statistics for the Government of the Republic of Lithuania.

- The road traffic deaths data for children and adolescents aged 0 to 19 years in 1998-2012 were investigated.

Material and Methods

- All victims, deceased in road traffic crashes, following ICD-10, were divided by road user categories: pedestrians (code V00-09), cyclists (code V10-19), motorcyclists (code V20-39), and in cars (code V40-79).

- Child injury mortality rates were calculated per 100,000 population. The number of population available for the beginning of the year was used for the study.

Material and Methods

- Road traffic mortality rates per 100,000 children and adolescents were calculated for the whole group, and for the male and female victims.

Material and Methods

- Regression analysis was used for estimating mortality rate trends.
- Linear regression was used for the study.
- The significance level $p \leq 0.05$ was considered statistically significant.
- The Bioethics Committee approved the study.

Results

- In total, 1319 children and adolescents (944; 72% boys and 375; 28% girls) aged 0-19 years were killed in road traffic crashes in Lithuania over the period 1998-2012 (Table 1).

Table 1. Road traffic deaths (in absolute numbers) by type of road users over 1998- 2012 in Lithuania in the age group of 0 to 19 years

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
pedestrians	42	33	23	29	27	20	15	24	26	18	18	10	11	11	6
cyclists	10	8	11	11	12	7	3	9	6	5	4	2	0	5	4
motorcyclists	10	7	5	6	7	10	6	8	11	12	9	8	5	7	3
cars	43	58	60	56	58	61	61	67	72	81	30	39	21	16	18

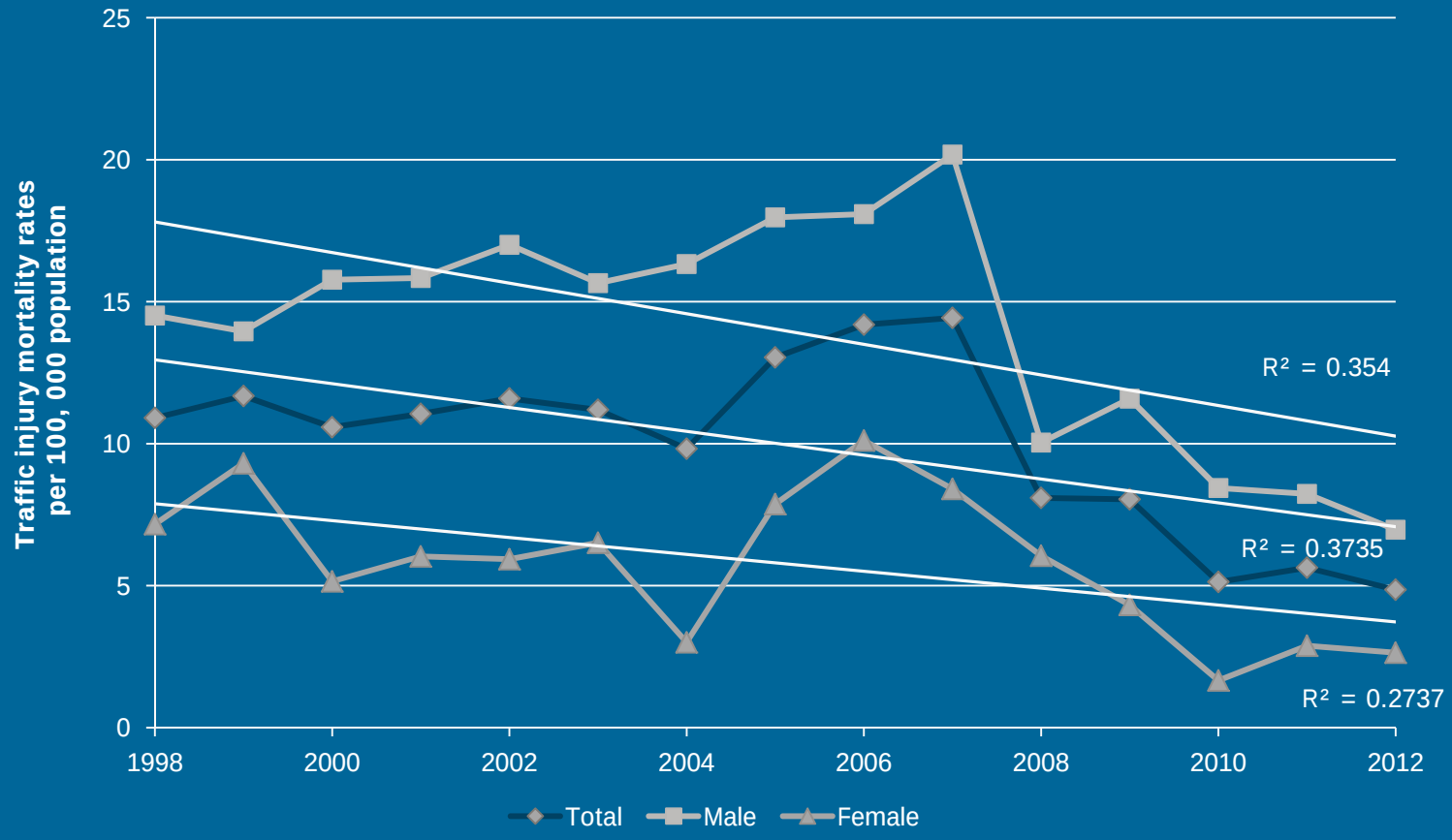
Results

- Study results revealed that, traffic injury mortality rates trends declined significantly in the whole group (R^2 = 0.374, p = 0.015), and in the boys (R^2 = 0.354, p = 0.019) and girls (R^2 = 0.274, p = 0.045) subgroups.

Results

- Boys were killed nearly 2.5 times more often than that of girls (Fig. 2).

Figure 2. Road traffic mortality rates per 100, 000 population over 1998-2012 in Lithuania in age group 0 to 19 years by sex

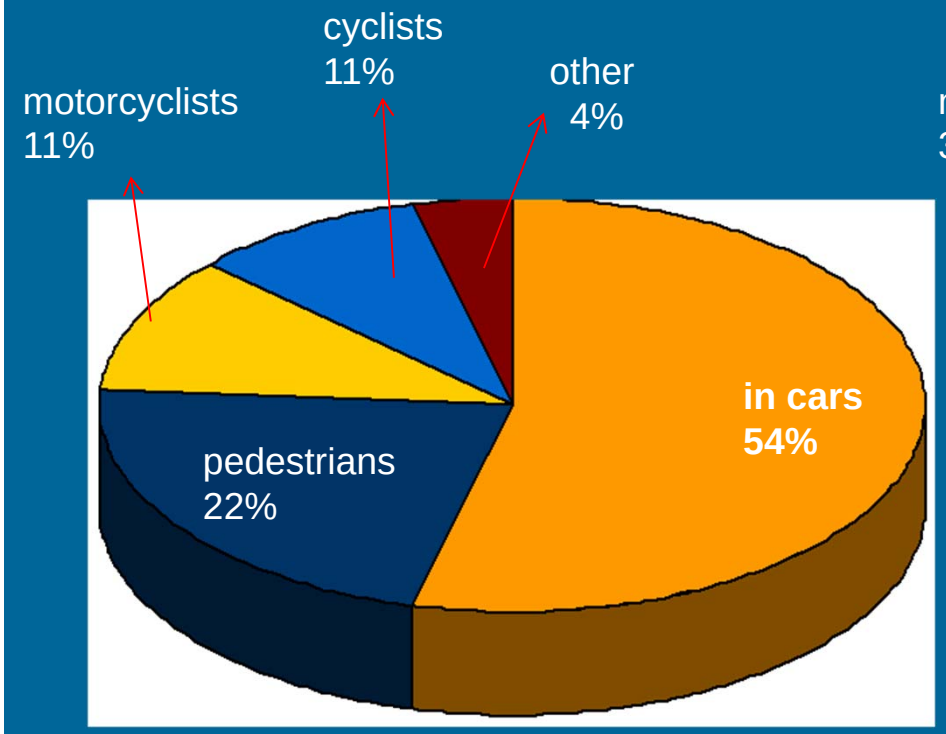


Results

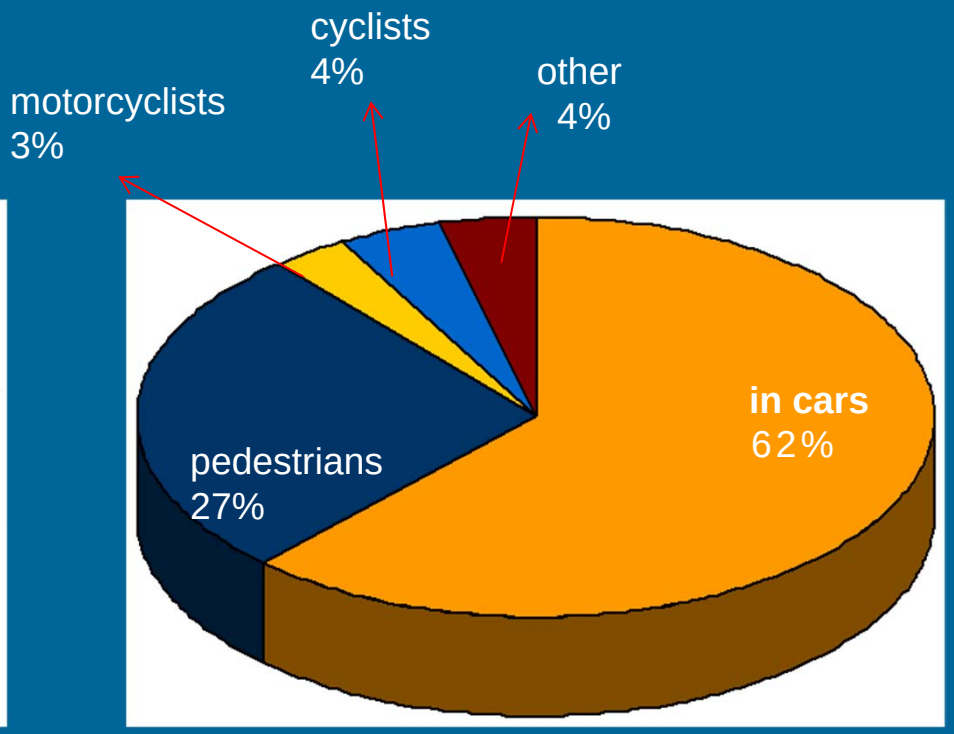
- By gender, 508 (54%) boys were killed when travelling inside the car, 211 (22%) - as pedestrians, 105 (11%) - as motorcyclists, and 81 (9%) boys - while cycling (Fig. 3a).
- Correspondingly, 233 girls (62%) were killed as car occupants, 102 (27%) – as pedestrians, 16 (4%) – as cyclists and nine (3%) - as motorcyclists (Fig. 3b).

Figure 3. Boys (a) and girls (b) aged 0-19 years, killed in road traffic crashes over 1998-2012 in Lithuania (by road users)

a) Boys



a) Girls



Results

- Totally, in the age group 0 - 19 years, car occupants (56%) were most affected, followed by pedestrians (24%), motorcyclists (9%), and cyclists (7%).

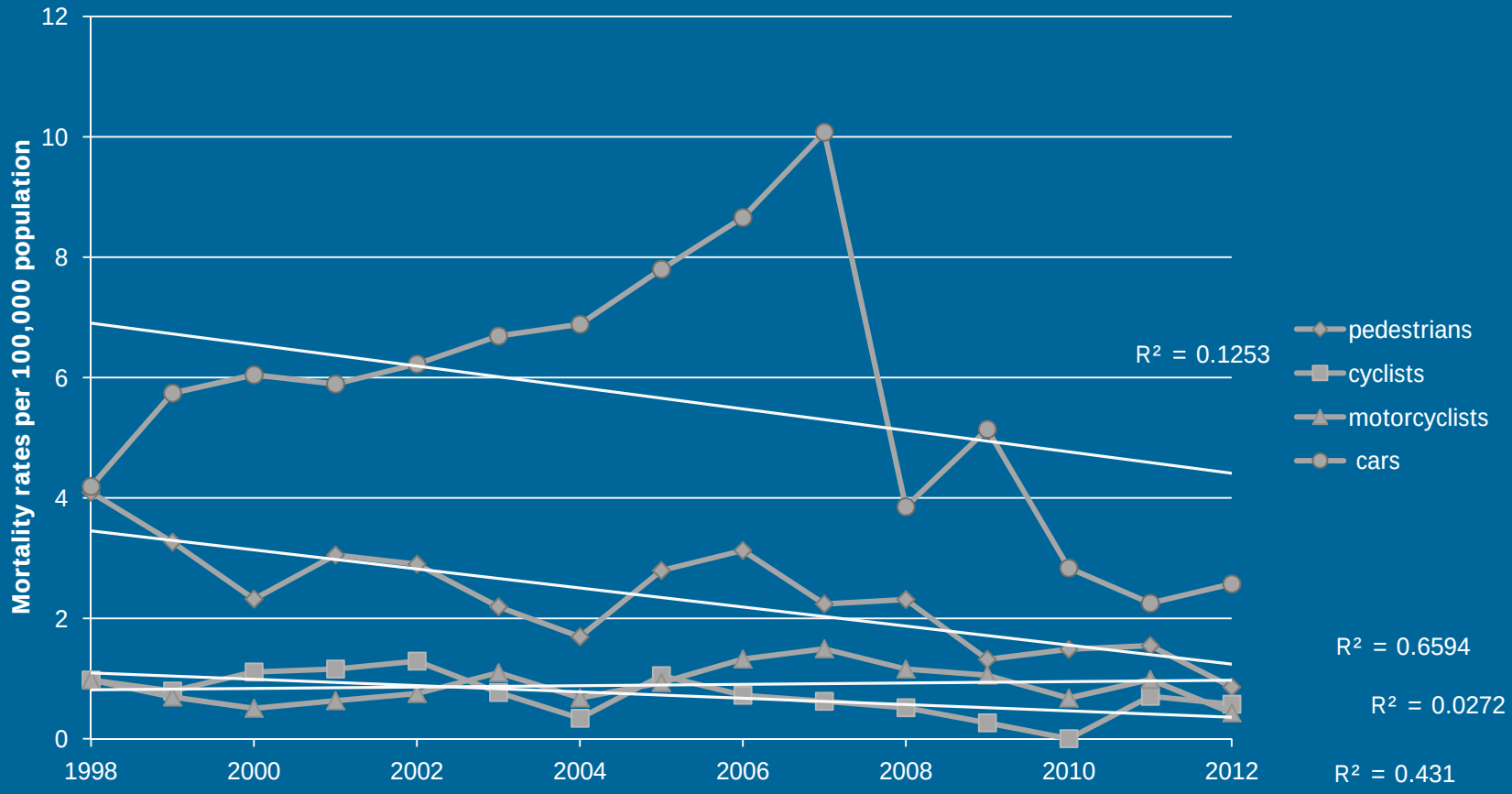
- Linear regression showed significantly decreasing trends for pedestrians ($R^2 = 0.659$; $p = 0.000$) and cyclists ($R^2 = 0.431$; $p = 0.008$) mortality rates, whereas for motorcyclists, no significant change in mortality rate was observed ($R^2 = 0.027$, $p=0.549$).

Results

- For car occupants' mortality, there was an increase from the beginning of the study period, followed by a sudden steep decline after 2007.

- However, linear regression showed no significant change ($R^2 = 0.125$, $p = 0.196$) (Fig. 4).

Figure 4. Road traffic mortality rates per 100, 000 population over 1998-2012 in Lithuania in children and adolescents aged 0 to 19 years (distribution by road users)



Results

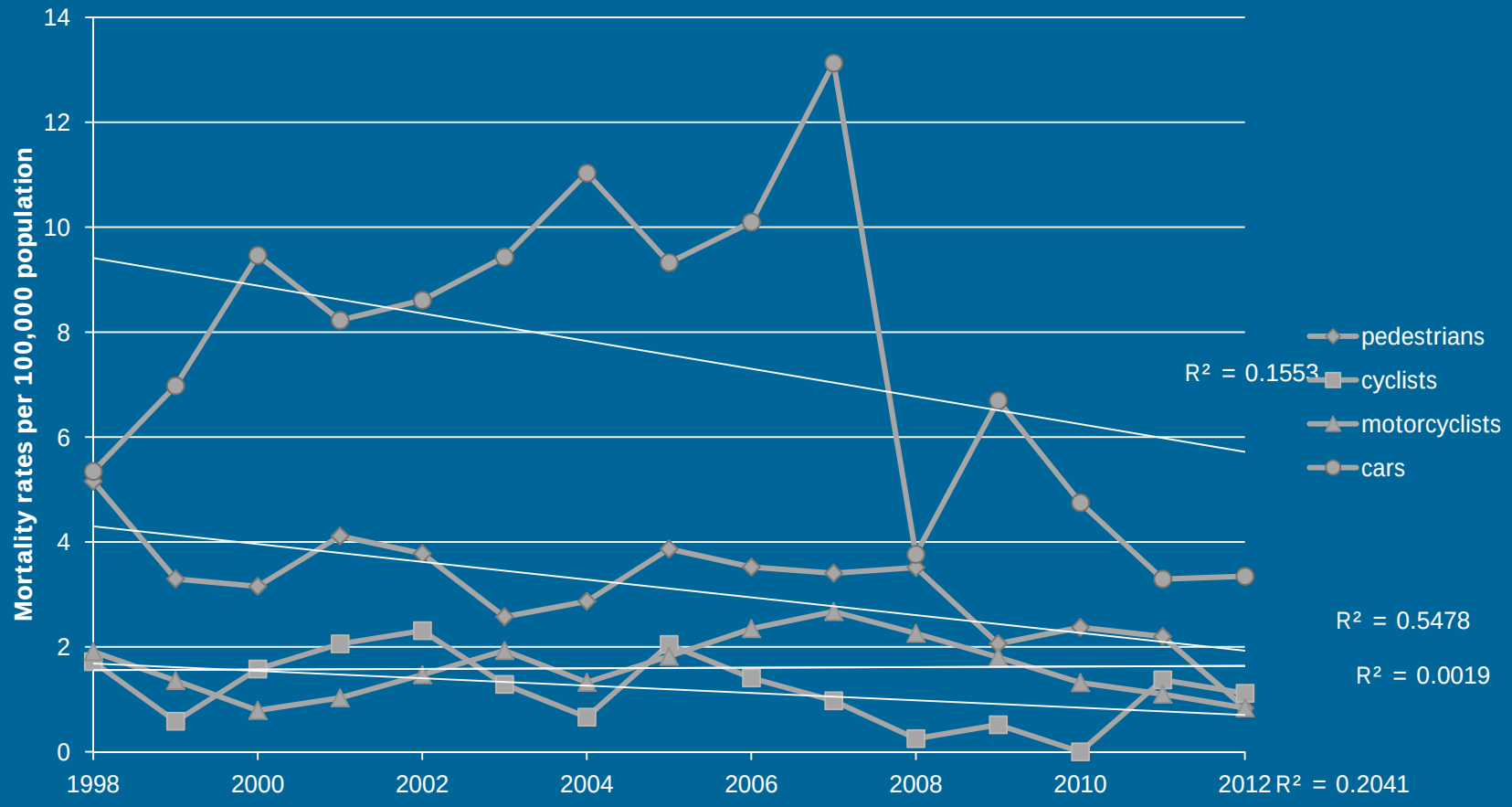
- By gender and road user, linear regression showed significant decrease for pedestrians in male subgroup ($R^2 = 0.548$, $p = 0.002$).

- For male cyclists ($R^2 = 0.204$, $p = 0.091$) and motorcyclists, ($R^2 = 0.002$, $p = 0.876$) no significant changes were determined.

Results

- For boys in cars, mortality rates were increasing almost permanently up to 2007, followed by a sudden decrease, but linear regression showed no significant change ($R^2 = 0.155$, $p = 0.146$) (Fig. 5).

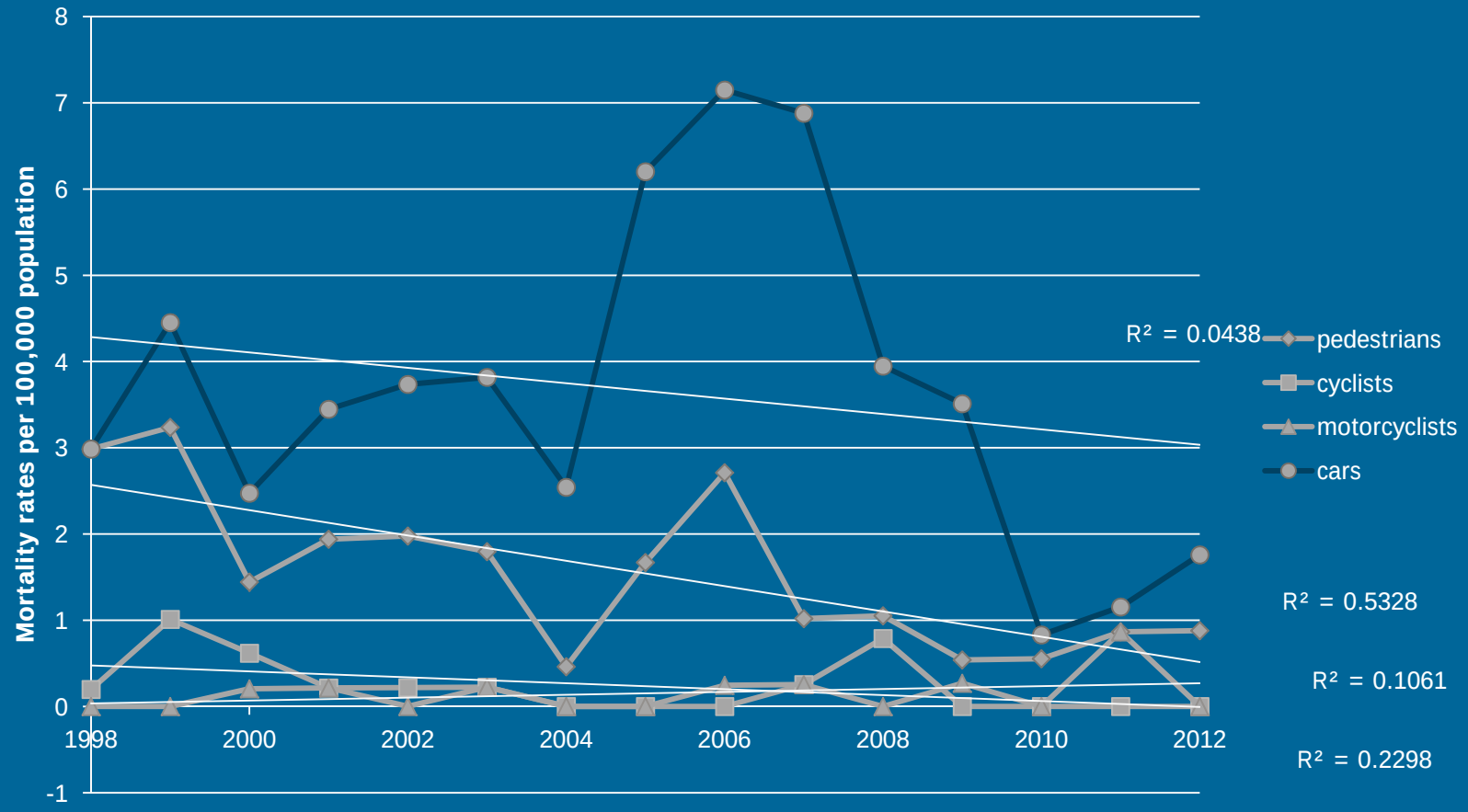
Figure 5. Road traffic mortality rates per 100, 000 population over 1998-2012 in Lithuania in boys aged 0 to 19 years (distribution by road users).



Results

- For the girls subgroup, linear regression showed significantly decreasing trends for pedestrians
- ($R^2 = 0.533$, $p = 0.002$) and cyclists ($R^2 = 0.24$, $p = 0.05$). For female motorcyclists ($R^2 = 0.105$, $p = 0.239$) no significant trends were shown. For female car occupants, an increase from 2004 to 2007, and then the sharp decline from 2007 was revealed, yet linear regression did not show a significant change ($R^2 = 0.044$, $p = 0.453$) (Fig. 6).

Figure 6. Road traffic mortality rates per 100, 000 population over 1998-2012 in Lithuania in girls aged 0 to 19 years (distribution by road users).



Behaviour and Road safety Education

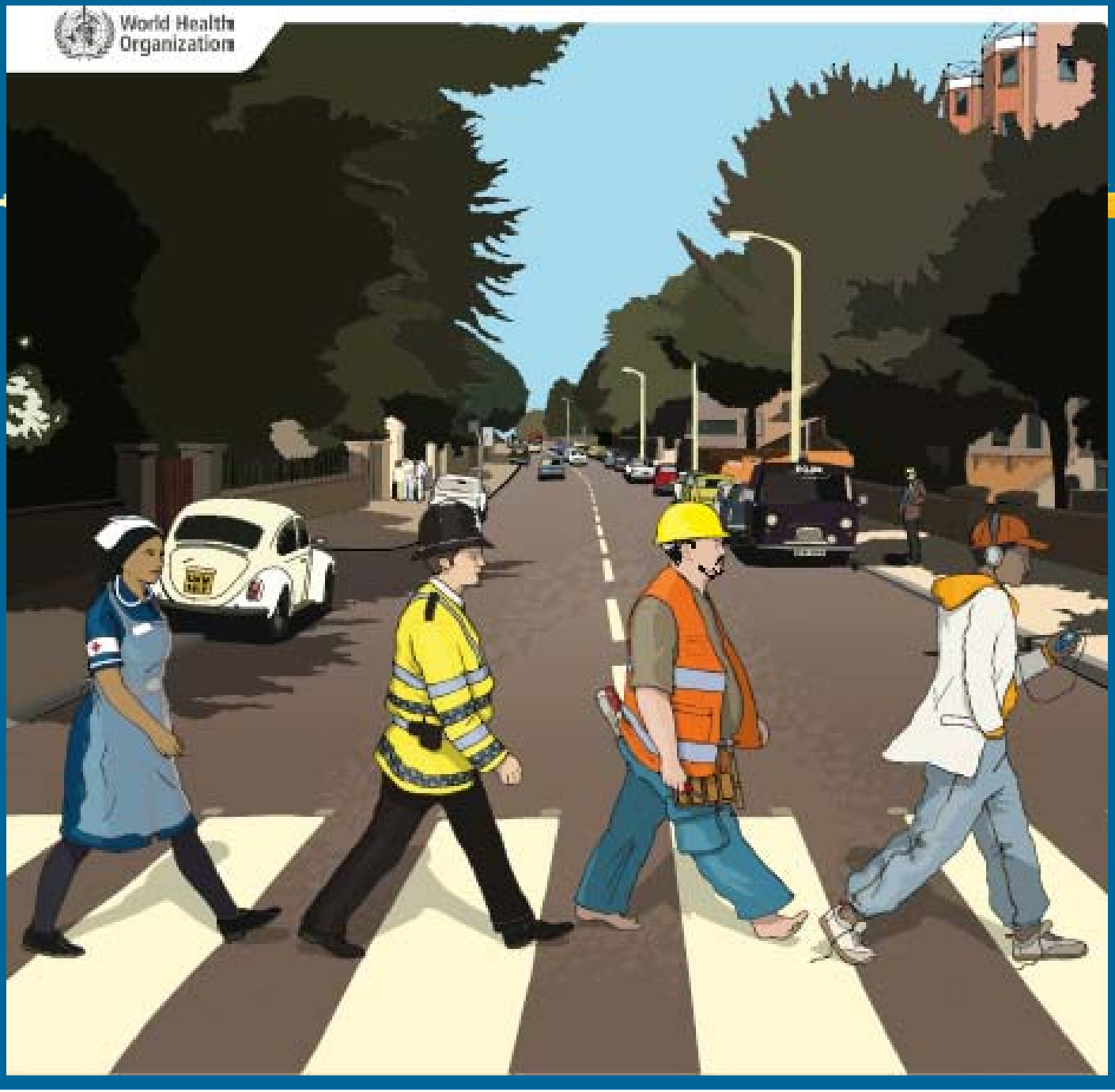
Strukcinskiene, et al. Transportation Research Part F: Traffic Psychology and Behaviour 2014; 24: 8–16.

- **Similarities between self-reported road safety behavior of teenage drivers and their perceptions concerning road safety behavior of their parents.**
- There are similarities between driving safety of teens and their parents, as reported by teens.
- The parents, who discuss road safety issues with their children, are more likely to apply restrictions on teenagers' driving.
- Parental involvement is vital for road safety promotion in young drivers.

Twisk DAM, et al. Accident Analysis and Prevention 66 (2014) 55–61.

- **Five road safety education programmes for young adolescent pedestrians and cyclists: A multi-programme evaluation in a field setting.**

- **Resulted in self-reported behaviour changes; cognitive programmes were found to be as effective as fear-evoking programmes**.


World Health Organization

Conclusions

- In children and adolescents aged 0-19 years, about one half of those killed in road traffic crashes over 1998-2012 in Lithuania were car occupants, and about one quarter - pedestrians. Boys died in road traffic crashes 2.5 times more often than that of girls.

- During the study period, there was a declining trend in traffic injury mortality rates in the age group 0-19 years in total and in both subgroups (boys and girls).

Conclusions

- Pedestrian and cyclist mortality rates declined significantly over the study period, while motorcyclist and car occupant mortality rates showed no significant changes.

- A long-term decline is more likely to be affected by sustainable and permanent road safety promotion efforts. Reduced risk exposure may have been influenced as well by economic recession.

Conclusions

- **Education, safe environment creation, along with improved medical treatment, progress in emergency medicine, modern intensive care equipment usage, and professional rehabilitation contributed to the significant reduction in child and young people traffic injury deaths.**

Conclusions

- More attention to road safety promotion in the age group 0 to 19 years should be given to the car occupants and motorcyclists.

Limitations

- Regarding data quality over time; the possibility of minimal mismatches still is possible, even if mortality data and statistical information in Lithuania is used by WHO, and is generally considered reliable and internationally comparable (6-9).

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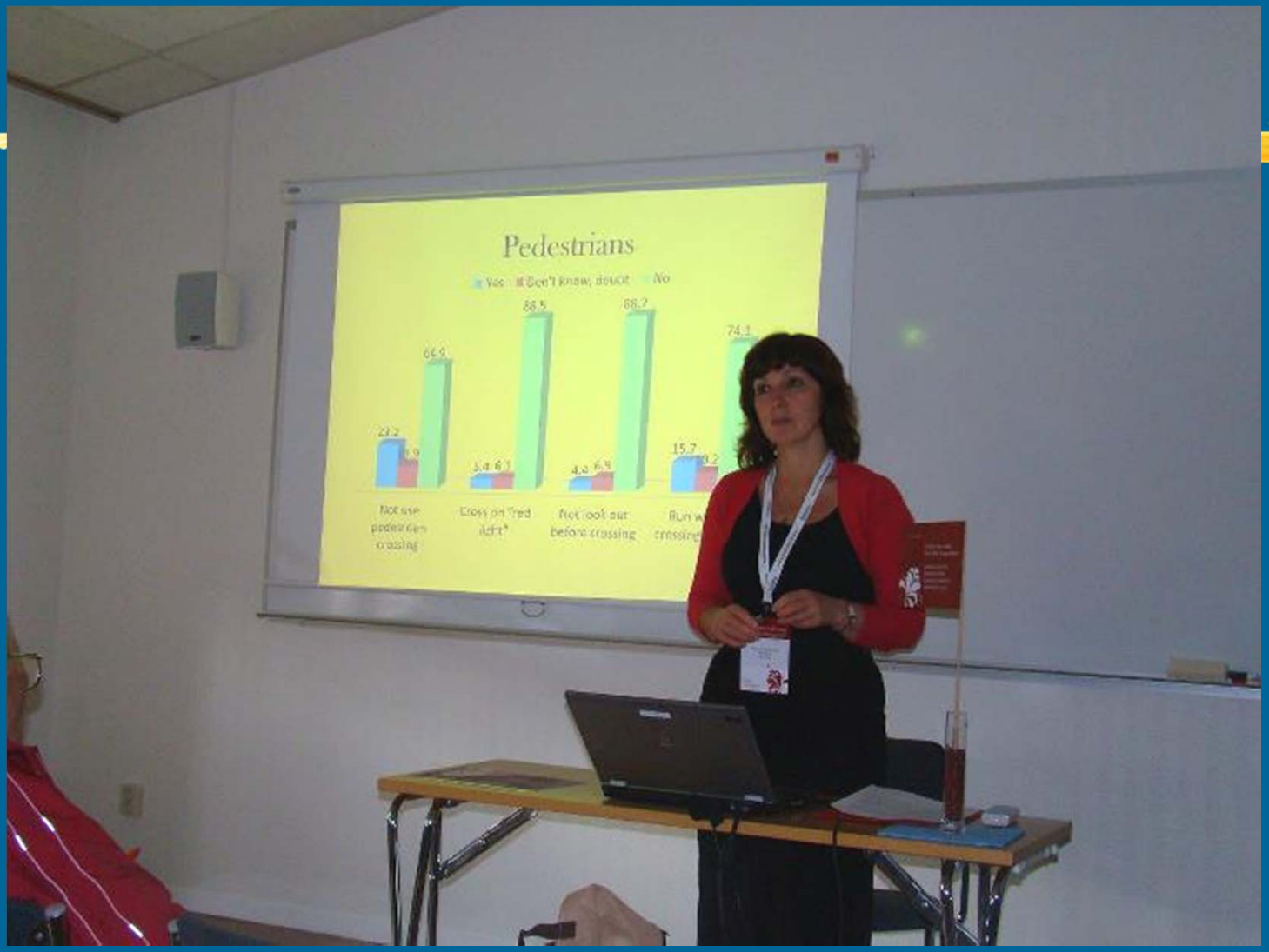
- This research was accepted for publication in the Third Issue, 2014 in The Turkish Journal of Pediatrics.

- *Strukcinskiene B, Uğur Baysal S, Raistenskis J.* ***Traffic injury mortality trends in children and adolescents in Lithuania by road users.***

Birute Strukcinskiene, MD, PhD, Associate Professor of Public Health. Faculty of Health Sciences, Klaipeda University, Klaipeda, Lithuania


Pedestrians
Yes
Don't know, doubt
No
23.2
64.9
3.4
6.1
88.5
4.8
6.5
88.7
15.7
74.1

Juozas Raistenskis MD, PhD, Associate Professor of Medicine. Vilnius University, Faculty of Medicine, Vilnius, Lithuania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‘ Frequency of injuries and changes in frequency over a period of time are of the predictors of population health ‘

Barbara Barlow, MD

Being injury free is a right for every child.