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Road safety: global public health problem and local solutions

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Magnitude and impacts of road traffic injuries (RTI)

Each year 1.2 million people die and 20–50 million people become disabled as a result of road traffic accidents (RTA) [5]. Every day hundreds of people around us, wherever we are – in Poland, China, Venezuela or United States, are dying preliminarily and suddenly – just going to work or vacations, crossing the road or on their way to an amorous appointment. They are drivers and pedestrians, mothers and children, old and young. The threat of road accidents is on everybody's mind, but it seems that we still do not realize the real magnitude of the problem. These are lives not lived, families not created, children not born. These are also disability pensions, pain, families broken, sufferings. And the situation is getting worse even though we know that these tragic situations and their consequences are predictable and preventable. Some countries – among them are Denmark and Sweden – have shown spectacular results in reducing the road accident rates.

Sustainable society and social development today suppose such conditions when individual human needs are met. But humans, probably like never before, depend on each other and to meet our own needs we have to think about the others. Not only families are broken when a person dies or becomes seriously disabled as a result of a road crash, but also there are social and economic repercussions. Victims of road crashes don't go to work, hospitals and social support services spend a lot of money to maintain them, economically active years of life are lost and finally the whole society has to share this huge toll estimated at least in 2% of GDP of a country [5].One of the road safety initiatives in China that increased the seat-belt use demonstrated the high cost-effectiveness and many disability adjusted life years (DALYs) saved as a result of the intervention [1]. Taking into consideration that victims of the road crashes are frequently young people (for example in the European Region road traffic injuries were responsible for 127,000 deaths in the WHO European Region, 55% of whom are aged 15–44), it is clear that an effective intervention would save many years not only of the life itself, but also young and active years free of disability. Therefore it is a shared responsibility, what in other words means that this problem requires a "multisectoral approach".

Friedrich Nietzsche wrote once that "the man of knowledge must not only love his enemies, he must also be able to hate his friends" [4]. Probably these words are suitable for the today's situation in road safety – we sometimes neglect till "hating" our friends – road safety measures that have proved their effectiveness and at the same time we love our enemies – risky environment, risky driving, drunk driving, traffic rules violations. And it seems that it happens at all levels – from the individual to the policy-making one.

One of the modern approaches in medicine is the "evidence-based medicine", which is when a patient receives treatment with the most effective means accessible that have proved their efficiency. One of the main problems in the evidence-based medicine is the accessibility of the latest updated information about the most effective schemes of treatment – not all health professionals want, know how to get it or just don't have time for it, although the information is accessible and available. Evidence-based road safety policy would be a possible solution for preventing road crash injuries, and decreasing number of deaths on the roads. And theoretically it would be easier than in medicine because this would be more a question of political will and implementation of the good practices more widely. Even by using only the present level of knowledge about prevention of road crash injuries.

Basically there are three factors on which road safety depends: road users (e.g. drivers or pedestrians), physical and social environment (roads, law, policy), and vehicles [3]. And all road safety measures are concentrated around these three components in three phases of the

traffic road accidents: pre-event; event and post-event. Traditionally the main "target" for the road safety policies has been the user, mainly the driver. Drivers' behavior was considered the main cause of road accidents. And generally it is true, because the majority of road crashes are caused by drivers' errors and their risky behaviors. But the new thinking about road safety has its focus not only on the users, accepting that human errors are inseparable part of human behavior, but also on the environment that should be organized in such a way that even in case of human error the damage to health, injury would be reduced. The simplest example would be the separation of the opposite traffic directions with mechanical barriers or modern crossroads when pedestrians cross the road "above" or "under" the road, and the building of bicycle paths.

High rates of mortality and morbidity caused by road traffic injuries (RTI), especially among the young population, are unacceptable consequences of road crashes. Unless actions are taken, the number of road traffic injuries and deaths is likely to continue to rise. How to reach better results in road safety, and which strategies, actions are effective and which are not? The purpose of this article is to try to answer these questions using the example of Poland, on the basis of the results of the National Seminar "Road Safety. Building the Bridges between Local and Global Initiatives" that was organized by the Institute of Public Health, Jagiellonian University Medical College in Krakow in November, 22, 2007.

Different sectors' roles in road safety

As it was mentioned above road safety is a sphere in which different players interact. The main, key players are: government, especially the transport and health care sector, researchers and non-governmental organizations (NGOs).

The role of national and regional government, policymakers is to support and fund good practices in prevention measures that reduce road traffic death rates and injuries using a complex approach through education, engineering and enforcement of standards and regulations, and particularly with the following tools:

- Enhanced development and increased enforcement of road safety standards and legislation.
- Supporting controlling institutions, such as police, transport inspection.
- Exchange of information and transfer issues regarding TRI prevention programs by capacity building and development of networking (national conferences, seminars, workshops).
- Ensuring evaluation of RTI prevention initiatives.
- Integrate effective strategies for RTI prevention form other countries into national public health programmes.
- Act as advocates with industry for the implementation of safety standards of the vehicles.

The role of researchers and academia is to:

- Conduct research for better understanding of the TRI risk assessment.
- Evaluate implemented programs and strategies, and to understand the facilitators and barriers for good practices implementation.
- Conduct cost – effectiveness studies to provide decision-makers with the actual and updated information for decision-making.
- Help to translate research results into key evidence statements that are easy to understand.
- Disseminate these evidence statements and take a more active role in advocating for policy choices that result in the implementation evidence based good practices.

The role of communities and NGOs and practitioners is to:

- Communicate the evidence/facts on what really works and show the successful examples.
- Build and extend collaborative networks with other NGO's working in the road safety field and with major stakeholders in business, government and academia.
- Provide expertise in the field of TRI prevention on what works and on the implementation of effective interventions, standards and regulations in various settings and target groups.

General information about the seminar

Thirty representatives of main stakeholders in the road safety area in Poland attended the seminar. Two of the invited reporters were absent: the representative of the Ministry of Health Department of Health Policy and the representative of WHO Poland. Organizers of the seminar got great support with materials and publications from the Department of Injury and Violence Prevention of the WHO Regional Office for Europe.

Selected preventive road safety interventions implemented by various sectors to prevent RTI in Poland were presented and discussed. The presentations were as following:

1. Prevention of Head Injury Among Children caused by Road Traffic Accidents in Poland – presented by public health students of the Institute of Public Health, Jagiellonian University Medical College (IPH JU MC).
2. Goals and Priorities of the National Road Safety Program "GAMBIT 2005" presented by the representative of Ministry of Transport and National Road Safety Council.
3. Assessment of Child Road Traffic Injury Prevention. Needed Actions to Improve Child Road Safety in Poland – presented by the National Coordinator of the European Programme "Child Safety Action Plan-CSAP", IPH JU MC.
4. The World Bank and Road Safety in Poland – presented by the representative of World Bank Office in Poland.
5. Police Actions for Improvement of Road Safety in Malopolska Region – presented by the police chief of Traffic Control Department in Kraków.
6. Road Safety Programme Implementation in Małopolska Region – presented by the representative of

Road Traffic Centre and Road Safety Council in Małopolska Region.
7. Emergency Medical Service in Poland. New EMS Act Implementation presented by the representative of Children's Hospital in Sosnowiec.
8. Improvement of Quality of Roads in Małopolska Region – presented by the representative of Traffic Engineering Department in Kraków.
9. Actions for Rights of Victims of Traffic Road Accidents – presented by the "Alter Ego" NGO representative, Association for TRA Victims Rights.
10. "I think Soberly, I Drive Soberly" Drivers' Educational Campaign – presented by representative of the "Safe Driver" Foundation NGO.

Method of assessment and results of the seminar

Presentations were analysed according to three main injury prevention strategies, so called "The Three E's": education, engineering, and enforcement. These strategies are recommended by the US National Committee for Injury Prevention and Control and by the WHO as the best investment to reduce RTI and their consequences**.** The presentations discussed during the seminar were analysed according to these prevention approaches [2,6].

1) Engineering: product design and roads environment improvement

This includes all kinds of changes of the environment to make roads more "vulnerable road users – friendly" to reduce risk, safer highways, which aim at eliminating, reducing, or modifying the transfer of energy. The modification must be effective and reliable, compatible with built environment. On the other hand it should be acceptable, easily understood, and properly used by the public. Therefore this strategy is most effective when used in combination with legislation and educational support. Examples of this type of strategy include area-wide measures to reduce pedestrian and cyclist risk, e.g. traffic calming.

Product modification is a more passive means of reducing the risk around certain products. It should result in easy access to these products on the market. This strategy becomes more effective when used in conjunction with legislation and educational activities, since it requires some human interaction to achieve full safety potential of the product. Examples of this type of strategy include efforts to modify vehicles design standards e.g. child pedestrian friendly bumper heights, air bags on-off switch.

2) Enforcement: safety legislation and regulations, policy, and measures to ensure compliance

Enforcement is used to modify products, environments, and individual behaviour. Safety legislation works but is often opposed because it interferes with individual freedoms. Law or regulation must be widely known, acceptable to the public. There should be perceived high probability of enforcement and severe punishment in case of breaking the rules. Widespread visible enforcement increases public perception of the negative consequences of non-compliance. Legislation is also more effective when used in combination with product or environmental modification and educational efforts, so the public is aware of and accept the law. Examples of this type of strategy include requirement of child remain seated in back seat of motorized vehicle under 4 years old, use of bicycle helmet while cycling, law assuming driver responsibility in crash involving a child pedestrian.

3) Education: campaigns, programs at schools, skills development and behaviour change strategies

The effectiveness of educational programs on their own is controversial and evidence is often lacking. However, if they are well designed and take into account the needs and abilities of the target population, and if they are used in combination with other strategies, such as engineering or enforcement, these programs can be effective. The most important criteria for effective use of this strategy is to expose the audience to appropriate, clear and trustful information. The audience has to get resourses and skills to take actions, which bring the benefits, and should have been reinforced to maintain the change over time. Educational approaches should incorporate improved access to safety products, use theory based models, and apply principles of community participation. An example of this type of strategy includes community based programs of bicycle helmet use among children, school age children pedestrian skills training.

Promoting the use of safety devices – safety devices are promoted to reduce the risk of injury occurrence or minimize the impacts in the event of an injury event. Examples of this type of strategy include bicycle helmet campaigns and child passenger restraints promotion in car sale.

The **Table I** shows the assessment of presented actions and programs during the seminar according to these TRI prevention strategies.

At present, special attention is directed toward the improvement of road infrastructure and drivers' safety in Poland. The main efforts are directed at improving roads design. Cyclists, pedestrians' safety strategies are defined in planned goals and still not sufficiently implemented (enforcing speed limits and providing safer conditions, building safer road infrastructure for vulnerable road users).

Education targeting the school-age children and youth and national campaigns targeting the young drivers are well implemented at the national level.

Despite of the amendment of the Road Traffic Law in 2005, there are still some issues and actions needed to be implemented and enforced i.e. requiring the use of cycle helmets, and better enforcement in pedestrian safety. The New Medical Emergency System Act from 2006 is still not fully implemented by the government, what limits the delivering of effective post-crash care. Therefore equitable access to high-quality trauma care is still limited in many Polish regions and significantly differs between urban and rural areas.

Road Safety Topics	Engineering	Enforcement	Education
1. Prevention of Head Injury Among Children caused by Traffic Accidents in Poland	–	–	+
2. Goals and Priorities of the National Road Safety Program	+	+	+
3. Assessment of Child Traffic Injury Prevention. Needed Actions to Improve Child Road Safety in Poland	+	+	+
4. The World Bank and Road Safety in Poland	+	–	–
5. Police Actions for Road Safety Improvement in Małopolska Region	+	+	+
6. Road Safety Programme Implementation in Małopolska Region	+	–	+
7. Emergency Medical Service (EMS) in Poland. New EMS Act Implementation	+	+	–
8. Improvement of Road Infrastructure in Małopolska Region	+	–	–
9. Actions for Rights of Victims Traffic Road Accidents	–	+	+
10. "I think Soberly, I Drive Soberly" Drivers' Education Campaign	–	–	+

Table I. *Assessment of the presentations according to the three E's strategies.*

Although a strict law regarding alcohol in blood of drivers exists, better enforcement among drivers is not effective enough.

There is a lack of policy to increase affordability and use of safety equipment such as car child restraints, cycle helmets, etc. Subsidized safety equipment especially for children should be combined with community educational programs.

WHO and EC Transport White Paper recommendations underline that road safety is a shared responsibility of all sectors involved. The seminar showed that the multisectoral collaboration is still not sufficiently developed between government departments, NGOs, police, fire brigades, industry and commercial sector, and media. The capacity building and professional network between researchers, practitioners and politicians need to be better developed.

The national TRI prevention plan has been successfully developed and endorsed by the government, but partnerships with stakeholders from different sectors and levels of society, including NGOs need to be better established. The seminar showed need of cooperative actions and commitment between national government injury researchers and injury practitioners including NGOs.

The conclusions of the seminar may be partly transferable to some other countries. In spite of the different country backgrounds and specifics the problems reflected in the results of the seminar look similarly in their magnitude, consequences and key player's actions.

Streszczenie:

Bezpieczeństwo drogowe: problem w globalnym zdrowiu publicznym i lokalne rozwiązania

Słowa kluczowe: urazy z powodu wypadków drogowych, bezpieczeństwo drogowe, prewencja wypadków drogowych, polityka, Polska, Małopolska

Urazy z powodu wypadków drogowych są głównym globalnym zagrożeniem w zdrowiu publicznym i stanowią rosnący problem zarówno w skali globalnej, jak i w poszczególnych krajach. Na podstawie rekomendacji Światowej Organizacji Zdrowia oraz raportów Komisji Europejskiej zostały omówione główne czynniki ryzyka wypadków drogowych oraz rekomendowane strategie prewencji, które powinny być realizowane w ramach krajowych programów i polityki. 22 listopada 2007 roku w Instytucie Zdrowia Publicznego UJ CM zostało zorganizowane seminarium *Road safety. Building the bridges between local and global initiatives* w ramach programu Erasmus z udziałem zagranicznych studentów Europubhealth oraz przedstawicieli sektorów i organizacji zaangażowanych w bezpieczeństwo drogowe w Polsce. Zaprezentowane działania i programy prewencyjne w czasie tego seminarium poddano analizie. Podjęto próbę oceny stopnia wdrażania odpowiednich strategii w programach realizowanych na szczeblu krajowym, wojewódzkim i lokalnym. W ocenie prezentowanych interwencji zastosowano podejście „3xE". Biorąc pod uwagę cele prezentowanych programów, zaklasyfikowano je do strategii edukacyjnych (*education*), inżynieryjno-technologicznych (*engineering*) lub legislacyjnych (*enforcemnet*). W dyskusji zamykającej seminarium podkreślono potrzebę rzeczywistej, mocniejszej współpracy pomiędzy różnymi sektorami i organizacjami, które są głównymi udziałowcami (*key-players*) w obszarze bezpieczeństwa drogowego na poziomie krajowych oraz lokalnych działań. Prezentacje studentów z Chin, Rosji, Meksyku potwierdziły, że problem współpracy międzysektorowej i interdyscyplinarnej na rzecz bezpieczeństwa drogowego częściowo dotyczy również ich krajów.

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