

The role of public health in injury prevention

Rationale

Injuries are a neglected epidemic in the WHO European Region.¹ There is evidence however that this leading cause of death and disability can be prevented through concerted public health action.

Aim

To define the role of public health in the prevention of injuries.

Definition of injuries

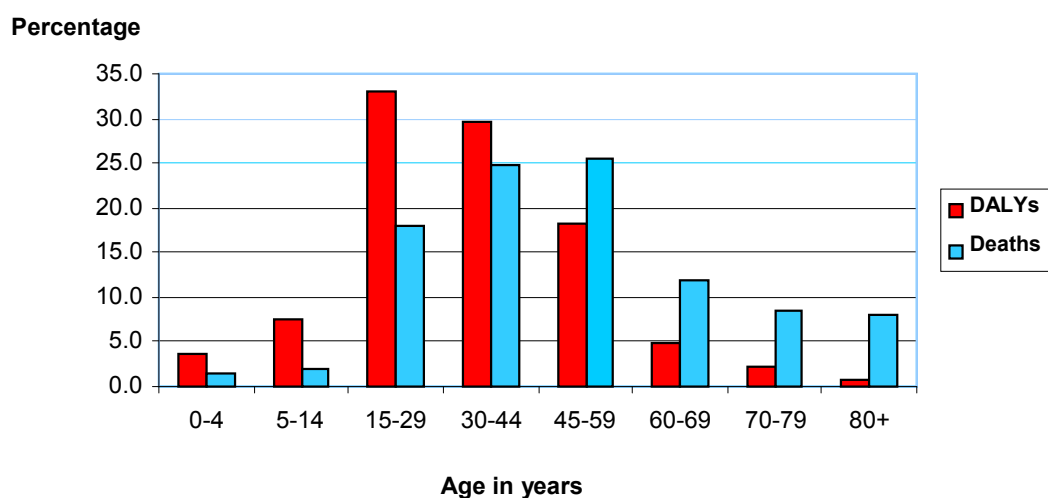
An injury is the physical damage that results when a human body is suddenly subjected to energy in amounts that exceed the threshold of physiological tolerance, or from a lack of one or more vital elements (for example, oxygen). The energy could be mechanical, thermal, chemical or radiant. It is usual to define injuries by intention. The main causes of unintentional injuries are road crashes, poisoning, drowning, falls and burns.^{2,3} Intentional injuries result from violence and can be directed at others (interpersonal violence), to the self (self-directed violence) or at groups (collective violence).⁴ Violence is the intentional threat or use of physical force against oneself, another person or a group or community that results in injury, death, psychological harm, maldevelopment or deprivation.

The scale of the problem

Injuries are a leading cause of death and in the 53 countries of the WHO European Region there were an estimated 790 000, accounting for 9% of deaths from all causes.⁵ In the European Union (27 countries) there were an estimated 252 000 injury deaths, and about a quarter of these are intentional.^{6,7,8} Deaths are only the tip of the iceberg, and for every injury death there are an estimated 30 hospital admissions, 300 emergency department attendances and many thousands more who seek help from their general practitioner or self treat.⁸ In the European Union alone, it is estimated that there are about 7 million hospital admissions annually, constituting 8% of all admissions.⁶

The scale of the disabilities that result from injuries is not adequately documented. Disability-adjusted life years (DALYs) are one way of estimating the non-fatal effects of injuries, where one DALY is one year of healthy life lost due to premature death or disability. Injuries were responsible for 14% of all the DALYs lost in the Region. In people between 1 and 45 years old, injuries are a leading cause of death. Three out of four injury deaths occur in males. Injuries cause 21% of the deaths but 44% of the DALYs lost in people aged 0-29 years (Figure 1).

Figure 1: Percentage of deaths and DALYs lost from all injuries by age in the European Region for both genders, 2002 (Source GBD 2002 version 3)





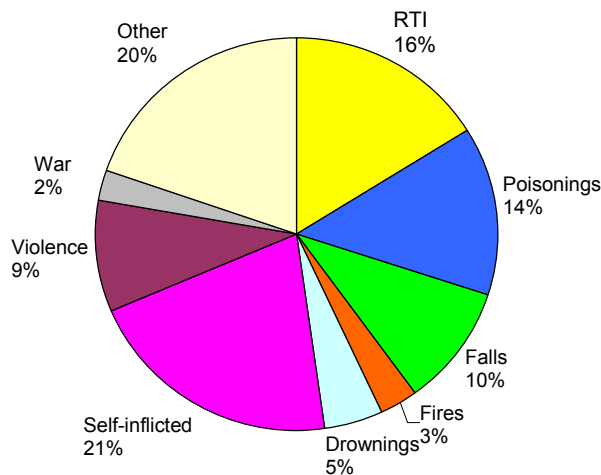
Injuries result in high health and social care costs, which are borne not only by society but also by victims and their families. As injuries affect people when they are potentially most productive, they are a cause of high economic loss, resulting in high societal costs. These have not been mapped for all injuries, but for road traffic injuries alone are thought to amount to 2% of the national GDP in most European countries.¹⁰ Although the costs for other injuries have not been measured, reports from some countries suggest that for domestic violence this

amounts to 2% of GDP.¹¹ It is likely therefore that for all injuries the total societal costs must be substantial, and investment in evidence-based prevention will be cost-beneficial to society.

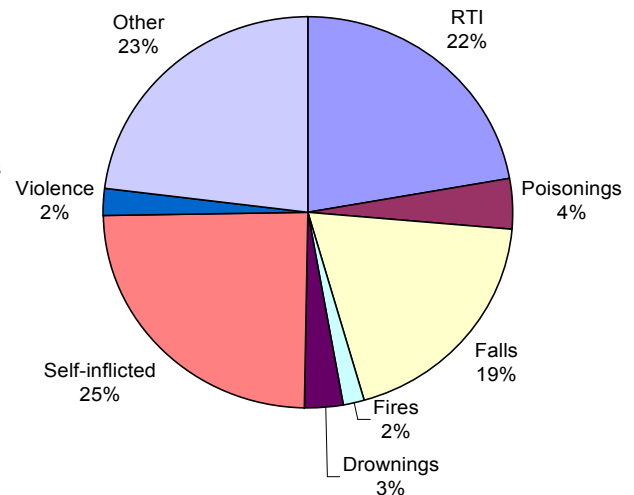
The three leading causes of injury death in the European Region are self-inflicted injuries, road traffic injuries (RTI) and poisoning (Figure 2). In contrast in the European Union, the three leading injury causes are self-inflicted, road traffic and falls.

Figure 2: Proportion of deaths from injuries by cause in European Region and European Union for both sexes and all ages

Proportion of deaths from injuries by cause in European Region for both sexes 2002 (GBD 2002)
(Total number of deaths = 790 878)



Proportion of deaths from injuries by cause in European Union
(Average 252 000 deaths for last 3 years)



Note: Other injuries refer to all other injuries which do not fit into the main categories above. The major part of these are unintentional, and would include causes such as choking, suffocation, strangulation, injury due to impact with a physical object, animal bites etc. Data for the European Union were calculated using the WHO Statistical Information System.

The injury map of Europe (Figure 3) shows the inequalities in injury death rates across the Region and shows that within the Region there are some of the highest and lowest rates.¹² These differences are also apparent, albeit not to such an extent, when the European Union countries are examined in isolation (Figure 4).⁶ When taken together death rates in the low- to middle-income countries are 3.7 times higher than in high-

income countries.^{1,13,14} The countries with the lowest rates have achieved this level of safety through years of organised efforts of society and by acknowledging prevention as a societal responsibility. This represents an opportunity for transferring good practice in Europe through networks of policy-makers and practitioners, but this potential yet remains mainly untapped.



Figure 3: Map of European Region showing age standardised death rates from all injuries. Source Health for all mortality database (January 2006)

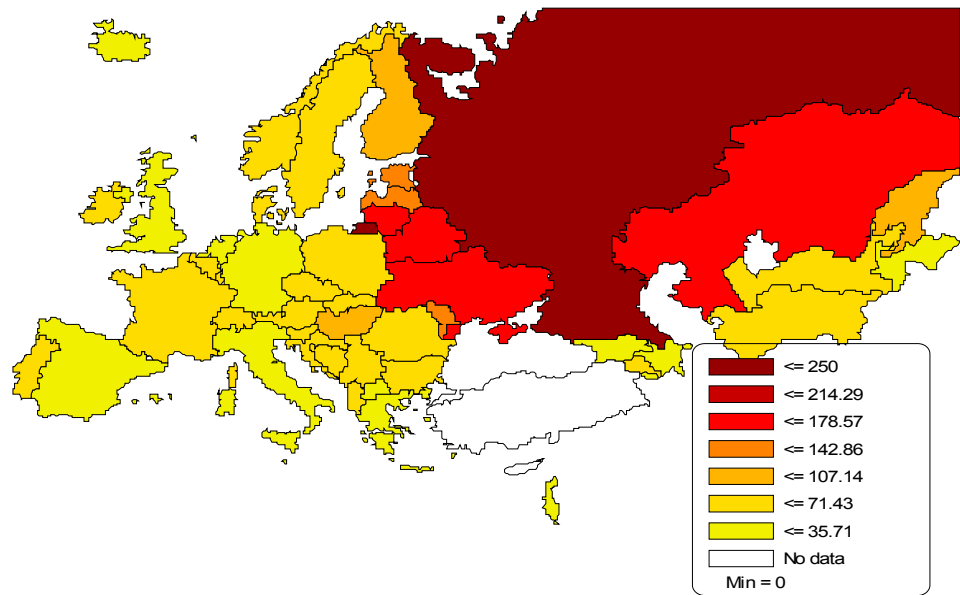
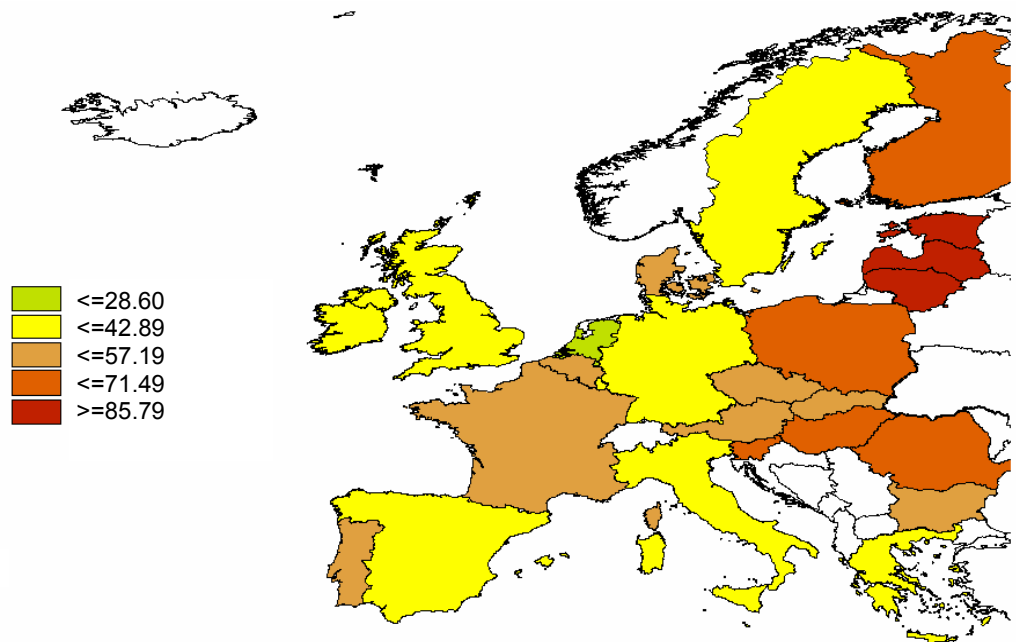


Figure 4: Map of European Union showing age standardised death rates from all injuries. Source Health for all mortality database (January 2006)



Why has so little action been taken in injury prevention?

Why should such a serious cause of death and disability have been so neglected by society at large? Traditionally injuries have been perceived as unavoidable occurrences and a science-based approach to prevention has only been realised in the last few decades.¹⁵ As injury prevention has been low on the agenda of policy-makers, few

resources have been dedicated to counteracting the problem, with relatively little research and development in the field, and relatively little media interest. Some countries have lacked the capacity to mount a public health response to injury prevention. One of the main obstacles in confronting injuries is the lack of visibility of the problem.¹⁶ In many countries injury surveillance and ready access to information on the extent, causes and consequences of injuries



have not been available. This has led to a failure to appreciate the magnitude of the problem and a lack of involvement by civil society (or those institutions and organisations outside of government). As injuries occur in almost any setting, prevention programmes need necessarily to be multi-sectoral. This requires a clear identification of which sector or body has the lead for prevention, and without this there has been a consequent lack of ownership. Similarly preventive efforts have been fragmented to date and there is a need for stronger coordination and leadership.

Policies prioritising the prevention of injuries and violence

Whereas unintentional injuries and violence have received relatively little policy priority in the past, prevention policies have been placed firmly on the public health agenda recently. There have been a number of World Health Assembly resolutions and United Nations General Assembly resolutions prioritising violence and injury prevention:

- WHA49.25: *Prevention of violence: a public health priority*;
- WHA56.24: Implementing the recommendations of *the World report on violence and health*;
- WHA57.10: *Road safety and health*;
- United Nations General Assembly resolution 58/289: *Improving global road safety*.

In Europe injury prevention has also received policy priority:

- Regional Committee resolution EUR/RC54/R3 on *Environment and health and Children's Environment and Health Action Plan for Europe* (CEHAPE) with a regional priority goal on preventing injuries in children;¹⁷
- Regional Committee resolution EUR/RC55/R9 on *Prevention of injuries in the European Region*¹⁸
- the European Commission complementary communication and Council recommendation on injury prevention for adoption in 2006¹⁹
- the European Commission White Paper *European transport policy for 2010: time to decide*, and the target to reduce road traffic injury deaths by 50% by 2010.²⁰

These initiatives have emphasised injuries as a public health priority and although not legally binding, provide a policy platform from which a more systematic and coordinated approach to injury prevention can be made at a national and local level. This represents an opportunity for stakeholders to take the issue of prevention forward in Member States.

Prevention effectiveness

Major advances have been made in a number of areas of safety concern, but there is still room for more effective action to reduce the huge toll of injuries in society. Countries with lower injury rates have invested in safety as a societal responsibility, rather than delegating this to individuals. Legislation and enforcement to ensure safer environments (e.g. road and housing design, the use of safety equipment) and reduce risk behaviours (e.g. driving under the influence of alcohol) have been key to changes that affect the general population. Relying solely on media and educational campaigns without infrastructural and institutional changes shows little evidence of effectiveness. For example, environmental laws ensuring traffic safety and housing design are thought to have halved injury mortality in Sweden over 25 years and reduced inequalities in injuries in different sections of society.^{21,22}

There is a growing body of evidence of effective injury and violence prevention strategies and many have been shown to be cost-effective.^{1,23,24} Cost–outcome studies show that investment in safety is a saving for society at large. For example, every €1 invested in child safety seats saves €32; the corresponding savings from other investments are €29 for bicycle helmets, €69 for smoke alarms, €19 for home visitation schemes with parent education against child abuse, €10 for prevention counselling by paediatricians, and €7 for poison control services.^{1,23,24} Much of this work comes from the United States of America, and needs to be adapted to European contexts. There is evidence from European transport settings where studies suggest that random breath testing for driving under the influence of alcohol would save €36 for every €1 spent, for road lighting this would save €11, for upgrading marked pedestrian crossings this would save €14, and widespread use of day time driving lights would save €4 for every €1 spent.²⁵ Whereas these results provide



the bases for evidence-based action, there is still further research needed to identify preventive strategies for a range of injuries, such as drowning.

The role of the health sector in unintentional injury and violence prevention

The public health approach to unintentional injury and violence prevention has been proposed as the way forward in the European Region by both WHO and the European Commission and key elements of the WHO resolution and Commission communication are summarised in the Box.^{18,19}

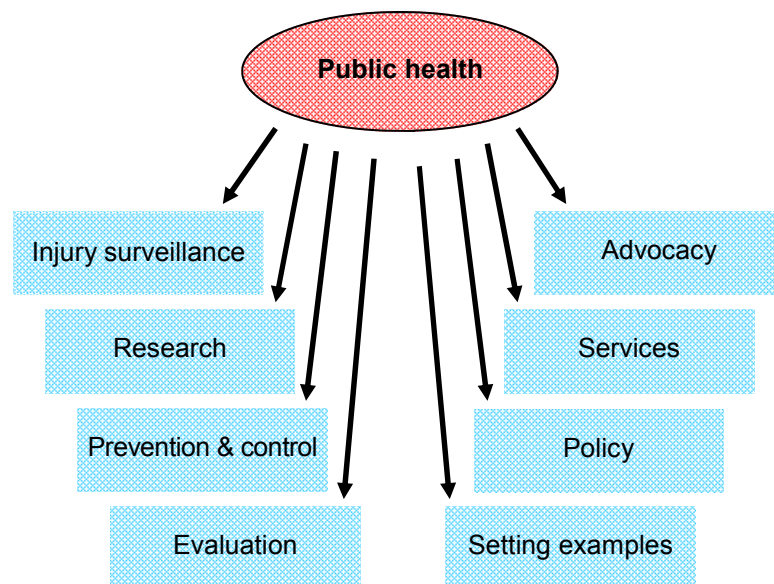
Box: Key elements of the Commission communication and WHO Regional Committee resolution

- Developing national plans
- Surveillance
- Capacity building
- Research on effective intervention measures
- Risk communication
- Sharing evidence-based practice
- Creating networks/ synergies/ partnerships
- Providing services for victims

The public health approach is a science-based approach, which involves all relevant sectors, disciplines and actors and is based on a logical sequence of actions. This involves 4 steps: 1) surveillance to identify the size of the problem, 2) an analysis of risk factors to identify what are the causes, 3) finding out what works for prevention and then 4) implementing prevention programmes on a large scale and evaluating these.^{1, 15}

The health sector has a broader role to play other than just providing evidence-based services for injuries, violence and rehabilitation and this is highlighted below (Figure 5).²⁶

Figure 5: The role of the health sector and the way forward



Deaths only provide a small part of the whole burden of injuries and the health sector is ideally placed to collect data on non-fatal injuries on people presenting to emergency departments and being admitted to hospital.⁹ Using these data sources also provides a more complete picture than relying on only one source, e.g. non-fatal road traffic injuries are known to be underestimated by police data. Surveillance can also be used to collect data on risk factors for injuries, and analysis will lead to the identification of locally relevant factors such as alcohol, unsafe consumer products, poverty, etc. Examples that employ a systematic methodology include the WHO Injury surveillance guidelines and the EC's Injury database project.^{6,9} Building a complete picture in an area as diverse as injuries requires that data sources from other sectors be

used as well. The sharing of anonymised data is central to mounting a multisectoral response. Research studies and surveys can also contribute to a more complete picture of the prevalence of injuries, the risk factors and the longer-term health consequences.

Part of the science-based approach is finding out what works in the way of prevention, as demonstrated by the cost-effective examples above. Such information can be sourced from systematic reviews of evidence-based good practice that has been obtained from experimental scientific studies. The next step is to implement this on a broader scale taking local contexts and priorities into account. This requires the development of programmes of implementation that are adequately resourced and with



rigorous evaluation to find out whether these programmes are working at a population level. Public health can contribute to the design and evaluation of programmes where other sectors might have the lead.

With its ready access to reliable surveillance data, the health sector can act as a powerful advocate to mobilise opinion and resources for prevention. By fulfilling its role as a stakeholder and involving others, public health can put safety and injury prevention higher on the policy agenda and contribute to policy formulation. To formulate and implement policy for injury prevention requires the close and coordinated working of senior people from different sectors, and an inter-ministerial injury prevention committee is one way of achieving this. Such inter-departmental collaboration can only work if there is ownership of the injury prevention committee by all sectors. When national plans are formulated these need to be owned by all the partners, have realistic goals and timescales, with appropriate resources and clearly identified roles. Achieving this requires that injury prevention and safety promotion are a priority area for other sectors.

Advocating for injury prevention requires health professionals to work beyond their traditional role in cure and rehabilitation. More health professionals need to be sensitised to this important role in implementing and advocating prevention. Furthermore, as a large employer the health sector needs to set an example to other sectors by putting safety and prevention as a priority for all health care employees regardless of their position.

There is a need to build capacity to respond to the challenge of prevention in many countries in view of the relatively recent history of injury prevention as a field. In this respect courses such as the TEACH-VIP course can be used, and public health can play a powerful role in building capacity in health and other sectors.²⁷

Public health has a central role to play in tackling the burden of injuries. Working with other sectors is essential to the way forward and achieving a safer Europe will require commitment from practitioners, advocates and policy-makers.

References

1. Sethi D, et al. *Injuries and violence in Europe. Why they matter and what can be done*. Copenhagen, WHO Regional Office for Europe, 2006.
2. Baker SP, et al. *The injury fact book*. Second edition. New York, Oxford University Press, 1992.
3. Peden M, McGee K, Krug E. *Injury: a leading cause of the global burden of disease 2000*. Geneva, World Health Organization, 2002.
4. Krug EG, et al. *World report on violence and health*. Geneva, World Health Organization, 2002.
5. GBD estimates [web site]. Geneva, World Health Organization, 2002. (http://www3.who.int/whosis/menu.cfm?path=whosis,burden,burden_estimates,burden_estimates_2002N accessed April 2007)
6. Zimmerman N, Bauer R. *Injuries in the European Union. Summary 2002-2004*. Vienna, Austrian Road Safety Board (KfV), 2006.
7. Petridou ET, et al. Unintentional injury mortality in the European Union: How many more lives could be saved? *Scand J Public Health* (in press).
8. Stone DH, et al. Intentional injury mortality in the European Union: how many more lives could be saved? *Injury Prevention* 2006;12:327-332.
9. Holder Y, et al. *Injury surveillance guidelines*. Geneva, World Health Organization, 2001.
10. Racioppi F, et al. *Preventing road traffic injury: a public health perspective for Europe*. Copenhagen, WHO Regional Office for Europe, 2004.
11. Walby S. *The cost of domestic violence*. London, Women and Equality Unit, 2004.
12. *Mortality by 67 causes of death, age and sex (off-line version), supplement to the European health for all database (HFA-MDB)*. Copenhagen, WHO Regional Office for Europe, 2005 (available at <http://www.euro.who.int/hfadb>).



13. Sethi D, et al. Reducing inequalities in injuries in Europe. *Lancet* 368:2243-50.2006.
14. Koupilova I, et al. Injuries. In (eds) Tamburlini G, Ehrenstein OV, Bertollini R. *Children's health and environment: a review of evidence. (Environmental issue report No 29.)* Copenhagen, European Environment Agency, 2002,130-140.
15. Krug E, Sharma G, Lozano R. The global burden of disease. *American Journal of Public Health*, 2000,90:523-536.
16. McKee M, et al. Health policy-making in central and eastern Europe: why has there been so little action on injuries? *Health Policy and Planning* 2000, 15: 263-269.
17. WHO Regional Office for Europe. *Children's Environment and Health Action Plan for Europe (CEHAPE)*. Copenhagen, WHO Regional Office for Europe (http://www.euro.who.int/childhealthenv/policy/20020724_2 accessed 7 April 2007)
18. WHO Regional Committee for Europe resolution. EUR/RC55/R9 *Prevention of injuries in the WHO European Region*. Copenhagen, WHO Regional Office for Europe, 2005. (http://www.euro.who.int/eprise/main/WHO/AboutWHO/Governance/resolutions/2005/2005922_1, accessed April 2007).
19. Communication from the Commission to the European Parliament and the Council on *Actions for a Safer Europe* COM(2006) 328 (http://www.ec.europa.eu/health/ph_determinants/environment/IPP/documents/com_328_en.pdf, accessed April 2007)
20. European Commission. *White Paper. European transport policy for 2010: time to decide* (http://ec.europa.eu/transport/white_paper/index_en.htm)
21. Laflamme L. *Social inequality in injury risks*. Stockholm, Sweden's National Institute of Public Health, 1998.
22. Gustafsson LH. Children in traffic. Some methodological aspects. *Paediatrician* 1979, 8:181-187.
23. Miller TR, Levy DT. Cost-outcome analysis in injury prevention and control: eight-four recent estimates for the United States. *Medical Care* 2000, 38:562-582.
24. *Working to prevent and control injury in the United States. Fact book for the year 2000*. Atlanta, National Center for Injury Prevention and Control, 2000.
25. European Transport Safety Council. *Cost-effective EU transport safety measures*. Brussels, ETSC, 2005. (<http://www.etsc.be/documents/costeff.pdf>)
26. Peden M, et al. *World report on road traffic injury prevention*. Geneva, World Health Organization, 2004.
27. *TEACH-VIP. Users' Manual*. Geneva, World Health Organization, 2005. (<http://whqlibdoc.who.int/publications/2005/9241593547.pdf>, accessed April 2007)

(Published in September 2007)

Partners



Acknowledgements

Apollo is a project that is co-sponsored by the European Commission in the framework of the Public Health Programme (Grant Agreement 2004119). The project aims to identify strategies and best practices for the reduction of injuries within the EU and is led by the Centre for Research and Preventing of Injuries (CEREPRI) of the University of Athens. This document has been produced by EuroSafe, in collaboration with the WHO European Centre for Environment and Health, within the framework of work package 6 of Apollo.

It has been written by Dr Dinesh Sethi, Technical Officer, Violence and Injury Prevention, WHO European Centre for Environment and Health, WHO Regional Office for Europe. Reviewed by the APOLLO management team.