

Injuries: the neglected burden in developing countries

Richard A Gosselin,^a David A Spiegel,^b Richard Coughlin^c & Lewis G Zirkle^d

Injuries are a neglected epidemic in developing countries,^{1,2} causing more than five million deaths each year, roughly equal to the number of deaths from HIV/AIDS, malaria and tuberculosis combined. The seminal *Global burden of disease and risk factors* study estimated that injuries accounted for more than 15% of all ill-health in the world in 1990 and forecast this to increase to 20% by 2020. More recent calculations have corroborated this alarming trend.² There are no definitive data on the number of people who survive with some form of permanent disability for every injury-related death, but estimates run between 10 and 50 times more.¹ More than 90% of injury deaths occur in low- and middle-income countries, where preventive efforts are often nonexistent, and health-care systems are least prepared to meet the challenge. As such, injuries clearly contribute to the vicious cycle of poverty and the economic and social costs have an impact on individuals, communities and societies. The socioeconomic impact of injury-related disability is magnified in low-income countries, where there are often poorly developed trauma care and rehabilitation systems and little or no social welfare infrastructure. Of all categories of injury, road traffic crashes have appropriately received the greatest attention. Economic development in low-income countries is accompanied by an increase in the number of vehicles, with the associated rise in traffic-related crashes, injuries and deaths. The estimated annual cost of road traffic injuries is more than US\$ 500 billion, which far exceeds the total global expenditures in developmental assistance. For every death from a road traffic crash, there are many more hospitalizations, emergency department visits and injuries, often leading to permanent disability.

Despite the weight of evidence, the importance of preventing and treating injuries in low- and middle-income countries has yet to be embraced by

the global public health community. Research is grossly underfunded and insufficient resources have been allocated for strengthening the delivery of medical services.³ Better treatment of injuries will help achieve three of the UN's Millennium Development Goals, namely the reduction of child mortality, improving maternal health and promoting gender equality with respect to access to health-care services.

While data on burden, epidemiology, effectiveness and cost-effectiveness of many diseases and interventions in developing countries are available and fairly reliable, particularly for infectious diseases or nutrition, such information is sorely lacking for injuries and their management. Perhaps this explains why other problems may be perceived as more urgent, making trauma advocacy that much more difficult. There are many dimensions to injuries: human (victim, caregiver, etc.), environment (infrastructure, legislation, etc.) and "vector" (motor vehicles for road traffic injuries, arms for violence, open fires for burns, etc.). Even in a world where approximately 3–4% of all health expenditures go towards research and development, injuries are under-represented considering their relative contribution to the overall burden of disease. Bishai et al. have calculated that the per capita yearly expenditures on road safety are just US\$ 0.07 in Pakistan and US\$ 0.09 in Uganda.⁴ Even when adjusted for the difference in per capita gross domestic product of high-income countries, the investment disparity remains significant and reflects the low priority given to traffic safety in low-income countries.⁴ The Ad Hoc Committee on Health Research (WHO) has been advocating for an increase in injury-related research funding since 1996, and the second edition of the *Disease control priorities in developing countries* has identified research and development for injuries as a "best buy".¹ A recent review could identify only three economic evaluation studies on

injury-related interventions in developing countries.⁵

The World Bank's Disease Control Priorities Project estimates that building speed bumps could cost US\$ 2–5 per disability-adjusted life year (DALY) averted, which compares favourably to the costs per DALY averted from supplementation with, for example, vitamin A and zinc, with or without measles vaccination (US\$ 25 and US\$ 19, respectively).¹ Other safety interventions, such as seatbelt and helmet use, sidewalks and roundabouts, have been used successfully in selected low-income countries. In addition, data on evidence-based interventions for road traffic injuries, particularly for non-fatal outcomes, are mostly from developed countries and not always transferable to developing countries' environments, where vulnerable populations are different (driver/passenger versus pedestrian/cyclist).

While recognizing that strategies aimed at prevention must be developed and supported, we consider that there is an urgent need to strengthen the delivery of treatment to the injured. It is only recently that surgery itself has been recognized, contrary to expectations, as a cost-effective public health intervention. A recent study from Cambodia showed a cost-effectiveness of US\$ 78 per DALY averted by surgical treatment of injuries in a trauma hospital.⁶ Providing safe and timely medical care, including access to essential surgical services, can only be achieved by addressing weaknesses within the health care system. This requires a greater investment in infrastructure, physical resources and supplies, and trained health workers, relative to other competing health priorities such as immunization or HIV surveillance.

[Editor's note: Read more on this subject next month in the *Bulletin's* special theme issue on child injuries and violence.] ■

References

Available at: <http://www.who.int/bulletin/volumes/87/4/08-052290/en/index.html>

^a University of California at Berkeley, School of Public Health, 643 Ferdinand Avenue, El Granada, CA, United States of America (USA).

^b Division of Orthopaedic Surgery, Children's Hospital of Philadelphia, Philadelphia, PA, USA.

^c Department of Orthopedic Surgery, San Francisco General Hospital, San Francisco, CA, USA.

^d Surgical Implant Generation Network (SIGN), Richland, WA, USA.

Correspondence to Richard A Gosselin (e-mail: froggydoc@comcast.net).

References

1. Debas HT, Gosselin RA, McCord C, Thind A. Surgery. In: Jamison D, Evans D, Alleyne G, Jha P, Breman J, Measham A, et al. Eds. *Disease control priorities in developing countries*. 2nd edn. New York, NY: Oxford University Press; 2006.
2. Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJL, eds. *Global burden of disease and risk factors*. New York, NY: The World Bank and Oxford University Press; 2006.
3. Ostlin P, Braveman P, Dachs N, WHO Task Force on Research Priorities for Equity in Health; WHO Equity Team. Priorities for research to take forward the health equity policy agenda. *Bull World Health Organ* 2005;83:948-53. PMID:16462988
4. Bishai D, Hyder A, Ghaffar A, Morrow R, et al. Rates of public investment for road safety in developing countries. Case studies from Uganda and Pakistan. *Health Policy Plan* 2003;18:232-5. doi:10.1093/heapol/czg028 PMID:12740328
5. Mulligan JA, Walker D, Fox-Rushby J. Economic evaluations of non-communicable disease interventions in developing countries: a critical review of the evidence base. *Cost Eff Resour Alloc* 2006;4:7. PMID:16584546
6. Gosselin RA, Heitto M. Cost-effectiveness of a district trauma hospital in Battambang, Cambodia. *World J Surg* 2008;32:2450-3. PMID:18716830