The global impact of injury – who bears the brunt?

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The burden of injury

- 5 million deaths per year from injury, accounting for around 9.2% of global mortality, with many millions more hospitalised
- 90% of deaths occur in low- and middle-income countries (LMIC)
- Injuries and violence have been neglected from the global health agenda for many years, despite being predictable and largely preventable

The scale of the problem

Injury deaths compared to other leading causes of mortality, world, 2012.

Deaths per year (millions)

<table>
<thead>
<tr>
<th>Cause</th>
<th>Deaths per Year (millions)</th>
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<tbody>
<tr>
<td>HIV/AIDS, TB and Malaria</td>
<td>0</td>
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<tr>
<td>Injury</td>
<td>8</td>
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Injury deaths by rank

Leading causes of death, 2013 and 2030 (projected)

1. Infectious heart diseases
2. Stroke
3. Lower respiratory infections
4. Lower respiratory infections
5. Diabetic retinopathy
6. Diabetic retinopathy
7. COPD
8. COPD
9. Upper respiratory infections
10. Chronic obstructive pulmonary disease
11. Chronic obstructive pulmonary disease
12. Lower respiratory infections
13. Lower respiratory infections
14. Diabetes mellitus
15. Diabetes mellitus
16. Diabetic retinopathy
17. Diabetic retinopathy
18. HIV/AIDS
19. HIV/AIDS
20. Congenital malformations

Men are more at risk of death from injuries and violence

Death rates per 100,000 population, by cause of injury and sex, world, 2012.

- Men
- Women
Global deaths, 1-4 years (GBD, Lancet, 2012)

Global deaths, female, 15-19 years, South Asia (GBD, Lancet, 2012)

Socioeconomic inequality for injury in all settings

- Significant socioeconomic divide for injuries even in high income settings
- People from low income settings live, work and travel in less safe conditions, there is less focus on prevention efforts in poorer areas, and poorer access to quality emergency trauma care and rehabilitation services
- Poor families are less likely to have the financial resources to pay the direct costs (e.g. medical bills) as well as the indirect costs (e.g. lost wages) related to injuries

Mechanisms underlying the influence of SES on injury

- Differential exposure: greater exposure of disadvantaged individuals or those living in deprived areas to a wide range of hazards and dangers in home, work and commuting environments
- Differential vulnerability: people of higher SES have a broad range of resources to protect their health and safety (e.g. money, knowledge, prestige, power, and beneficial social connections)
- Differential consequences following an injury: unequal availability and access to safer products and treatment

SES and injury in high income settings

- Studies have shown relationships between SES and non-fatal fall, poisoning and fire/burn injuries in adults (Bell et al, 2009 and Laflamme et al, 2009)
- In the US, residents of disadvantaged areas are at higher risk of motor vehicle fatalities (Cubbin et al, 2000)
- In Canada, road injury and fall deaths strongly associated with SES for males; poisoning, drowning, suffocation and fire/burn deaths, associated with SES in adults, especially low income or no occupation (Burrows et al, 2012)
Shift over time from premature mortality to years lived with disability
More problematic to estimate than deaths
Injury is an acute condition but clear from studies in HIC that large proportions of people don’t get wholly better
Global estimates derived from hospitalisation data or special surveys, but these are limited in LMIC
Disability weighting used in GBD not ideal
Injury accounts for 11% of DALYS globally in 2010 (GBD 2012)
Read injury increased from 12th to 10th rank from 1990 to 2010

Global estimates of serious injury

DALYS: both sexes, developing countries, all ages, 2013 (IHME)

DALYS: females, SE Asia, 15-49 years, 2013 (IHME)

Gaps in data

Important to understand the size of the problem – helps with resource allocation and investment in prevention and care
Surveillance data - traumatic injury not necessarily well collected
Establishment of trauma registries, special surveys
Balance between costs of collecting data and providing care
Gaps in estimation of injury outcomes especially in LMIC, and therefore generation of accurate disability weights

Injury in Indigenous populations

Globally, indigenous populations have higher rates of injury
In Australia injury death rates for Aboriginal and Torres Strait Islander people are 2-3 times higher than rest of population
The leading cause of fatal burden among Indigenous males and females aged 1–34 is injury
Injury are also a leading cause of years of life lost among Indigenous males aged 35–44
Injuries are the single largest contributor to the mortality gap among those aged 15–34, and second largest for those aged 35–54.
Similar contributor for mortality in Maori populations
}(Fatal burden of disease in Aboriginal and Torres Strait Islander people, AIHW)
Injury has a substantial economic impact

- Most deaths among those of working age
- Substantial out-of-pocket costs in low income settings, leading to catastrophic health costs
- Huge implications for productivity in developing economies

Cost of trauma in Vietnam

- Prospective cohort study: data collected during hospitalisation, and at 1, 2, 4 and 12 months of 892 patients; 634 had surgical care
- Road injury and falls accounted for most injuries
- A high proportion of injured people suffer catastrophic health costs and impoverishment 12 months later (~30%); >80% of those who had major surgery
- Highest costs from burns, falls and RTI
- The mean total costs up until 12 month post-discharge were US$ 804 (direct costs of US$625 and indirect costs of US$179) - average annual per capita income of US$ 695
- Biggest risk of catastrophic costs with lower leg injuries, head injuries, severe injury, older age, lower income, no health insurance


Cost of trauma in India

- Prospective cohort study at 3 hospitals in North India
- 2956 participants followed for 1, 2, 4 and 12 months following injury
- Median out of pocket expenditure for road traffic injuries was USD 160; catastrophic expenditure 48.8% for the poorest wealth quintile
- In overall sample prevalence of catastrophic expenditure was 30% (95% CI 26·95–31·05)

(Cost of trauma in India: Jagnoor, BMJ Open; Prinja, RTIRN 2015)

Need for universal health care

- Lack of quality health services and inadequate financial protection coverage for significant portions of the population in low- and middle-income countries
- Challenges include access to health care (availability, quality, timeliness) as well as cost
- Access also dependent on cost – in many LMIC patients have no insurance and have high out-of-pocket costs, leading to impoverishment or catastrophic health costs
- Out-of-pocket costs can be very high for non-medical fees even when insurance coverage is present for surgery

Access to surgery

- Surgical conditions account for approximately 30% of the global burden of disease
- Not everyone has access to care: 5 billion people do not have access to safe, affordable surgical and anaesthesia care when needed
- Of an estimated 312·9 million surgical procedures undertaken in 2012, only 6·3% were done in countries comprising the poorest 37·3% of the world’s population
- 33 million individuals face catastrophic health expenditure due to payment for surgery and anaesthesia care each year; 48 million cases of catastrophic expenditure are attributable to the non-medical costs of accessing surgical care
Annual and cumulative GDP lost in low-income and middle-income countries from five categories of surgical conditions

Proportion of the population without access to safe, affordable surgery and anaesthesia

Core indicators for monitoring of universal access to safe, affordable surgical and anaesthesia care when needed

Important need for improved rehabilitation

Global efforts in road safety
Global investment

- Little global investment in road safety from big donors
- Bloomberg Philanthropies Global Road Safety Programme - $125M over 5 years

Limited global action on unintentional injury

- Global action on falls
  Report from WHO in 2007
  Falls – rising burden in older people globally but countries not well established for geriatric care
- Little research on effective prevention in LMIC
- Burn prevention and care - the ‘forgotten global public health crisis’
  WHO currently testing Global Burn Registry
- ISBI and Interburns
- Drowning – recent world report
  Investment in countries with high drowning rates by international NGOs, research partnerships

Sustainable development goals

- Globally, focus is now shifting from the United Nations led Millennium Development Goals to a set of Sustainable Development Goals (SDGs)
- The Millennium Development Goals were the time-bound (2000-2015), quantified targets for addressing extreme poverty: income poverty, hunger, disease, lack of adequate shelter, and exclusion-while promoting gender equality, education, and environmental sustainability.
- The 2030 Agenda comprises 17 new Sustainable Development Goals (SDGs), which will guide policy and funding for the next 15 years

Goal 3. Ensure healthy lives and promote well-being for all at all ages

- 3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and wellbeing
- 3.5 Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol
- 3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents
- 3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all
- 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

- 11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons
- 11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations

The way forward

- Investment and advocacy for prevention
- Appropriately informed and funded prevention programs
- Better surveillance and injury outcome data
- Universal access to health care and appropriate financing
- Improved trauma care in LMIC and less developed settings