

# Injuries in Nepal - A Neglected Public Health Burden and Ways Forward

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The classic definition of injury, derived from Gibson (1961) and Haddon (1963) is: An acute exposure to physical agents such as mechanical energy, heat, electricity, chemicals and ionizing radiation interacting with the body in amounts or at rates that exceed the threshold of human tolerance.<sup>1</sup>

Injuries are an important component of non-communicable diseases. Injury is often labelled as an 'accident' which tends to imply the event was unavoidable and/or unpredictable. In contrast, most injuries occur as the consequence of a predictable set of circumstances and are therefore preventable. Often traditional beliefs in communities are that injuries are unavoidable and a consequence of fate. Other diseases have seen a reduction in incidence as a consequence of evidence-based research, and a similar approach now needs to be applied to injuries.

In Nepal, road traffic crashes are the major cause of injuries followed by occupational injuries, burns, violence and suicide related, poisoning, falls and drowning respectively. Injuries in Nepal vary depending on the different risks associated with living in different parts of the country (for example, the mountains compared to the Terai). As per the annual report of the Department of Health Services; road crashes, falls, burns and scalds and dog bites were reported in large numbers. Currently in Nepal, it's not clear how many people suffer injuries. However, estimates have been made using various sources. Injuries are thought to contribute around 10% of Nepal's total burden of diseases. According to the Ministry of Health and Population, Unspecified Injuries (T14) are the 3<sup>rd</sup> largest single cause of hospitalisation in Nepal in 2016, 'Fall/injuries/fractures' are the 5<sup>th</sup> leading cause of outpatient consultations (758,000 cases annually), and injuries are among top 10 causes of inpatient mortality, with V89 (Motor- or non-motor-vehicle accident, type of vehicle unspecified) being the 9<sup>th</sup> cause of inpatient death.<sup>2</sup> The Global Burden of Diseases study has estimated between 13,500 to 18,000 deaths annually in Nepal due to injuries with a further 780,000 to 1,000,000 Disability Adjusted Life Years (DALYs) attributed to injuries each year.<sup>3</sup>

The recent surge in expansion of the national network of roads and motorisation has exacerbated the situation of road injuries in Nepal. There are 12305 km of blacktopped roads in the country and with the recent expansion, the length of gravel roads and newly opened roadway tracks have become 6,865 km and 9,987 km respectively. Data from the Department of Transport Management, Nepal shows the number of newly registered vehicles increased from 88,735 in 2006-2007 to 444,259 in 2016-2017.<sup>4</sup> The condition of road infrastructure has improved in the last few decades in terms of road widening and paving. But a limited number of traffic lights, symbols, street lights, zebra crossings, and sidewalks for pedestrians, will place pedestrians at increased risk of road injuries.

There is no trauma or injury registry in Nepal, so it is difficult to find information about the number of deaths and injuries due to specific causes. Neither there is any agency in Nepal that should be responsible for the collection, compilation, analysis and dissemination of injury-related information. Very few studies have been done on injuries in Nepal and data collected from those studies are still not reliable. There are no official data on the number of injuries in Nepal except for the Road Traffic Crashes.

## **Injury epidemiology in context of Nepal:**

Injury is an important threat to health and wellbeing comprising around 9% of the total burden of disease globally.<sup>5</sup> It is therefore essential that we understand how and why people are injured to improve global health. Researching injuries is complex; the definition of injury may vary depending upon the scope of the research, the aim of the analysis, and the nature and severity of the injury itself. In addition, injuries may be fatal or nonfatal, and intentional or unintentional. High quality injury research requires the contribution of multiple disciplines both within and beyond health sciences. These complexities can all add barriers to effective research in this field.

Like other public health, medical or social research, injury research studies a health impact that affects the whole population; however, it does not do so equally, as some groups are more vulnerable to injuries than others. Traditionally, Nepal's health system has been orientated towards curative, rather than preventive services; largely as a consequence of the high prevalence of infectious diseases in the past. The health system of Nepal remains less well equipped to offer preventative services its population.

Epidemiological injury research generates evidence of the distribution and determinants of injuries in population groups across time and geographies. It applies classical epidemiological concepts and methods by 1) identifying the causes of an injury, 2) measuring the morbidity and mortality in a defined population, 3) understanding the natural history and prognosis of injuries, 4) evaluating the performance of preventive, diagnostic, and therapeutic interventions and 5) providing empiric evidence for the development of public policy to protect and improve health at the population level.

To tackle the challenges of injury prevention, researchers can draw on the conceptual model of epidemiology, also known as epidemiologic triad, of host, agent and vector. All three map well onto the epidemiological model for injuries.<sup>6</sup>

### **Injury research in Nepal and challenges to address**

Despite this considerable public health burden, injury research has not received adequate attention in Nepal, and there is a lack of human resources for injury research. Due to the neglect of the area of injury, Nepal does not have the experts needed to address the issues based on the best available evidence. Health care workers learn about the management of injuries, but rarely have exposure to latest knowledge on prevention. The Nepal Health Sector Strategy Implementation Plan (2016-2021) has recognised injuries as 'Trauma' and envisaged plans for trauma management, but policies to prevent injuries have not been prioritised.<sup>7</sup> In order to achieve improvements in injury prevention and control, there must be a robust strategy for prevention. Without prevention increasing numbers of patients suffering trauma will place an enormous pressure on healthcare resources. The direct and indirect costs of injuries to individuals, families and the nation have rarely been considered or researched. Such data are essential to influence policy development and implementation of injury prevention interventions.

Therefore, we have established the Nepal Injury Research Centre (NIRC) in Kathmandu Medical College with the aim to build research collaborations within Nepal and with international partners. The NIRC will enable sustainable capacity and capability for injury research, and to inform effective injury prevention across all sectors of Nepali life and work. The NIRC will support existing Nepalese injury researchers with their established networks and knowledge, and provide the infrastructure to develop a new generation of injury researchers.

The NIRC uses a public health approach to understand and prevent unintentional injuries and will generate evidence to enable behavioural, environmental, policy and legislative change for injury reduction in Nepal. A Public Health approach does not focus on individual patients, but on the maximum benefit attainable for the greatest number of the population. This approach is interdisciplinary and evidence based; utilising knowledge from many disciplines, including medicine, epidemiology, sociology, psychology, education and economics.

### **The NIRC will deliver outputs through four work streams:**

1. Stakeholder engagement – to understand the priorities of stakeholders at all levels of Nepalese society
2. Establishing injury surveillance – to understand the burden of injuries and identify risk factors for injury
3. Development and testing of interventions to prevent injuries
4. Capacity development of injury researchers and planning the sustainability of the NIRC

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