

A global plan for burn prevention and care

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Introduction

Each year more than 300 000 people die from fire-related burn injuries. Millions more suffer from burn-related disabilities and disfigurements which have psychological, social and economic effects on both the survivors and their families. The burden of burn injury is one that falls predominantly on the world's poor: 95% of fire-related burn deaths occur in low- and middle-income countries (LMICs). Not only are burn deaths and injuries more common in people of lower socioeconomic status, but the survivors find their pre-injury poverty levels worsen after recovery.

Differences in burn mortality rates vary across different age groups. For example, fire-related burns are the sixth leading cause of death among 5–14 year olds in LMICs. Survivors develop burn wound contractures and other physical impairments that limit function, lead to handicaps and reduce their chance of leading economically productive lives. Additionally these disfigurements often result in social stigma and restriction in their participation in society.

Inequity of injury

As noted by Mock et al. in an editorial in the *Bulletin*¹, injuries and violence cause disability and death to tens of millions of children across the globe each year. The burden is unfairly borne primarily by those in low- and middle-income countries where prevention programmes are uncommon and the quality of acute care is inconsistent. Burn injuries are dramatic examples of inequity. Even in a high-income country such as the United States of America (USA), burn injuries occur out of proportion among racial and ethnic minorities, as socioeconomic status – more than cultural or educational factors – accounts for most of the increased susceptibility of these children to burns. For example, the proportion

of African-American infants requiring hospitalization at burn centres is double their proportion in the general population.^{2,3}

Most burn injuries lead to prolonged and expensive hospital stays. In addition to pain management and wound care, burn patients require attention to nutritional deficiencies, to the consequences of suppression of the immune system and to rehabilitation therapy. In the USA, the average hospital fees for care of a child (aged 5–16 years) with extensive third-degree burns requiring skin grafting was more than US\$ 140 000.² Yet in spite of this lavish medical care, many burned children leave hospitals in the USA with permanent physical and psychological scars.

Recovery not just skin-deep

When confronted with the story of a burned child, the first picture that comes to mind is that of the agonizing open wounds, that eventually turn into undeniably obvious burn scars. But the thickened, non-compliant skin tells only part of the story. Much of the impact of burns is psychological. Studies of recovery from burn injury in the USA show clearly that the ability to adjust following injury is less dependent on the physical characteristics of the burn (such as burn size, burn depth or location) and more on the patient's pre-injury situation. Coping skills, family and community support, and general psychological health have more impact on recovery from burns than the burn itself.⁴ In the USA, this means that children from struggling family backgrounds are likely to have problems re-assimilating into school and community. In low-income countries, the consequences are more serious, including isolation from or even abandonment by the family, social segregation, unemployment and extreme poverty. Although children from affluent families in low-income countries have a

chance of recuperation, most children's situations deny them the opportunity to recover from even a small burn.

At the time of burn injury, all patients – young and old – experience shock, horror, pain and anxiety. For children, the events that follow their injury may confuse them and lead them to believe (sometimes correctly) that their death is imminent. Because few children in low-income countries receive appropriate first aid or immediate acute care, the medical mismanagement of the burn is likely to lead the child to the hopeless conclusion that little or nothing can be done to soothe the pain and relieve suffering. As a result, children may become emotionally overwhelmed and typically withdraw. They lose interest in food and activity and retreat to dark corners where they may lay motionless for hours. Unfortunately, this lack of activity compounds the speed with which wound contractures occur in the healing wound, heightening the child's disability.

Following the healing of the wound, the child often has post-traumatic stress, with nightmares, anxiety, depression and loss of motivation. The child may relive the intense emotional experiences of the injury event which may affect day-to-day events. There have been many cases where burn survivors have been stigmatized, socially excluded and their future employment has been disadvantaged because of their visible scarring. Psychological healing can take place in a supportive atmosphere, where family and health-care givers are available for support but, in resource-impooverished countries, this support is often inadequate or even absent. The child may suffer for life with both the physical and psychological scars of the burns.

Burn survivors in LMICs are vulnerable to stigma, exclusion and a life of poverty. They are frequently from poor communities and do not have the financial means to pay for surgery

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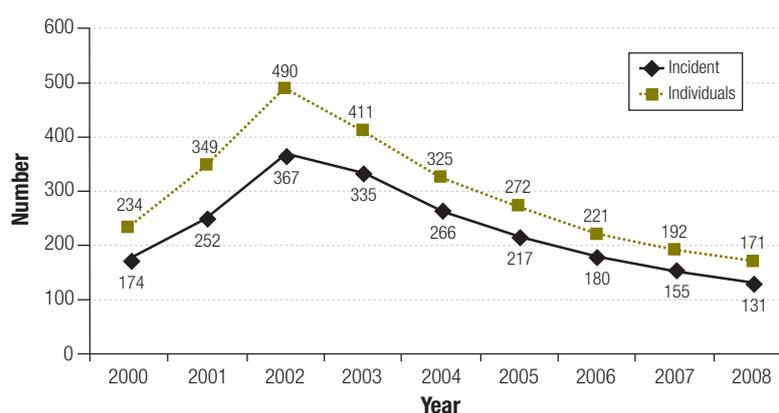
and other treatments needed to achieve functional and aesthetic improvements after the initial healing and grafting. They fall behind in their schooling or lose their jobs. Although disfigurement is a common sight in many LMICs, it is nevertheless a cause of stigma and avoidance, sometimes perpetuated by cultural beliefs. For personal accounts, see <http://www.projecttharar.co.uk>, <http://www.fire-children.org> and <http://www.asti.org.uk>.

Prevention is the key

A priority in LMICs must be to improve the provision of health care for burns to all in the population so that this economic inequity is eliminated. This includes the training of health personnel in burn prevention and management as well as those in the allied services (such as physiotherapists, nutritionists, occupational therapists, psychologists and social workers). However, social, political and fiscal challenges put this goal many years into the future.

Prevention is the key; truly the best way to treat a burn is to prevent it from happening in the first place. Effective prevention programmes will face similar barriers to implementation as those efforts to improve acute care but prevention is much more cost-effective and will clearly reach greater numbers of people. Although there is a dearth of research on the effectiveness of burn prevention programmes in LMICs, there are sufficient data available from developed nations to support the claim that burn injuries can be successfully prevented using education, engineering changes, enforcement of legislative protection and environmental modifications. For example, the State of Washington (USA) mandated in 1983 that the water temperature of new home hot water heaters be preset at 49°

Fig. 1. Acid attack trends in Bangladesh 2000–2008



Source: Acid Survivors Foundation

Celsius (120° Fahrenheit). Five years later the admission rate at the regional burn centre in Seattle had dropped from 5.5 cases to 2.4 per year.⁵ A smoke alarm giveaway programme in an area of Oklahoma City that had a high rate of residential fire injuries decreased house fire injury rates by 80% during the four years after the intervention.⁶

One example of an effective prevention programme in a low-income country is the Acid Survivors Foundation (ASF) of Bangladesh which has been working to reduce acid attacks on children and women since 1999. ASF has been raising public awareness, building institutional capacity and lobbying, working with other nongovernmental organizations, the media, celebrities and student groups to elevate community consciousness. It has also fostered advocacy and lobbying efforts with the government to ensure the passage and enforcement of laws and to create systems to provide service to acid survivors. As a result, the number of victims has dropped from 490 in 2002 to 171 in 2008 (Fig. 1). Based on the

success of ASF, similar organizations have been formed in Cambodia, India, Pakistan and Uganda.

It is evident from the experience of high-income countries that reductions in burn morbidity and mortality can be achieved as a result of thoughtful interventions. It is equally clear that in LMICs there are several barriers to implementation. The International Society of Burn Injuries has partnered with WHO to create a ten-year plan for burn prevention and care.⁷ Within this plan are specific proposals for addressing the need for changes in advocacy and legislation, for improved data collection and analysis, for stronger and more effective burn prevention programmes, for inclusion of burn prevention into national health-care strategies and to strengthen treatment services available for acute care and rehabilitation. The children of LMICs will be best protected from the horrors of burn injuries by expanding the global effort to eliminate burns. ■

Competing interests: None declared.

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