

Epilepsy

Untreated epilepsy is a precipitating factor for burns in many developing countries. The situation may be exacerbated by the common belief that the condition is associated with evil spirits, which may delay the rescue of victims.³⁵ For example, in an Ethiopian hospital, epilepsy is associated with 29% of burn admissions.³⁵ In the highlands of Papua New Guinea mortality rates from fire and flames are high and epilepsy is one of the most common risk factors for burns.³⁶

Prevention

Although survival from serious burns has been improving in several regions^{37,38}, primary prevention still remains the best way to cope with the problem. For instance, it has been found in Israel that school-based burn prevention programs significantly improve children's risk knowledge and injury-control beliefs.³⁹ In general, however, efforts to improve the safety of the environment remain more effective than efforts to change behaviour.

PREVENTION OF FIRE BURNS

- Enclose open fires and limit the height of open flames in homes in developing countries.
- Promote the use of safer stoves and less hazardous fuels.
- Apply safety regulations to housing designs and materials, and encourage home inspections.
- Promote fire safety education.
- Promote introduction of and compliance with industrial safety regulations.
- Promote the use of smoke detectors, fire sprinklers, and fire-escape systems in residential dwellings.
- Promote the use of fire-retardant fabrics for children's sleepwear and educate regarding the wearing of loose, flowing garments.
- Avoid smoking in bed and encourage the use of child-resistant lighters.
- Promote the development of fire-safe cigarettes.
- Improve the treatment of epilepsy, particularly in developing countries.

PREVENTION OF SCALDS

- Lower the temperature in hot water taps.
- Improve the design of kitchen utensils and stove manufacture, including more stable cooking surfaces and devices to protect and prevent access by children.
- Promote safety education.

Care of burns

Remarkable differences in burn outcomes can be observed between high-income and low-and middle-income countries. This is probably related to the difficulties in providing adequate burn care in the developing world, where even a small but deep burn can result in severe and disabling sequelae. In Australia, for example, a patient with a burn of 80% of the total body surface area

can be expected to survive with a satisfactory functional outcome³⁷, while in Nepal no patients survive who have burns on more than 40% of their body.⁴

Cost of burns

Little data exists of the medical cost of burns in low-and middle-income countries. There is no doubt however, that the social and medical costs of burns are significant for societies and families. In the USA the medical cost of primary health care for one inpatient with burns ranges from US\$ 3000 to US\$ 5000 a day. These expenses may account for only 23% of the total costs.³⁸ The economic impact of burns also includes loss of wages and the costs relating to deformities resulting from burns, in terms of emotional trauma and loss of skills.³⁹

Role of public health

- To describe the magnitude of the problem by collecting data on mortality and morbidity from burn injuries.
- To study the risk factors and protective factors.
- To show the economic impact of burns on the community in order to provide a basis for cost-benefit analysis of safety improvements.
- To ensure appropriate pre-hospital and hospital care and rehabilitation of patients with burns.
- To promote safety education.
- To monitor and evaluate interventions.
- To promote prevention measures and policies.

References available on request.

First aid

DON'TS

- Do not commence first aid before ensuring your own safety (switch off electrical current, wear gloves for chemicals etc.)
- Do not apply paste, oil, kumkum (turmeric), or raw cotton to the burnt area.
- Do not apply ice.
- Do not open the blisters.
- Do not apply any material directly to the wound as this increases the risk of infection.
- Avoid application of topical medication until the patient has been placed under appropriate medical care.

DO'S

- Stop the burning process by removing clothing.
- Apply cold water or allow the burned area to remain in contact with cold water for some time.
- In flame injuries, extinguish the flames by allowing the patient to roll on the ground, or by applying a blanket, or using water or other fire-extinguishing liquids.
- In chemical burns, remove or dilute the chemical agent by copiously irrigating the wound with water.
- Obtain medical care.

FACTS



World Health Organization

Injuries & Violence Prevention
Non-Communicable Diseases and Mental Health
www.who.int/violence_injury_prevention/index.html



International Society for Burn Injuries

Design by Inis - www.inis.ie

about injuries



Burns

A BURN INJURY OF THE SKIN occurs when some or all the different layers of cells in the skin are destroyed by a hot liquid (scalds), a hot solid (contact burns), or a flame (flame burns). Injuries of the skin and other tissues due to ultraviolet/infrared radiation, radioactivity, electricity, or chemicals are also considered to be burns.¹

Magnitude of the Problem

Mortality

Fire-related burns (injuries due to exposure to smoke, fire and flames) were responsible for an estimated 322 000 deaths in the world in 2002, the great majority of which occurred in developing countries. Table 1 below shows the distribution of these deaths in the WHO Regions – Africa (AFR), the Americas (AMR), Eastern Mediterranean (EMR), Europe (EUR), South-East Asia (SEAR), and Western Pacific (WPR).

Table 1. Estimated number of deaths and mortality rates due to fire, by WHO Region* and income group (high and low/middle), 2002

REGION:	AFR		AMR		EMR		EUR		SEAR		WPR		WORLD
INCOME GROUP:	LOW/MIDDLE	HIGH	LOW/MIDDLE	HIGH	LOW/MIDDLE	HIGH	LOW/MIDDLE	LOW/MIDDLE	HIGH	LOW/MIDDLE	HIGH	LOW/MIDDLE	
Burn deaths x 1000	39.2	3.9	4.5	0.0	31.9	2.8	35.4	184.0	2.3	17.5			321.8
Death rate per 100 000	5.8	1.2	0.8	0.6	6.4	0.7	7.4	11.6	1.1	1.2			5.2
% of global mortality due to fires	12.2%	1.2%	1.4%	0.0%	9.9%	0.9%	11.0%	57.2%	0.7%	5.4%			100%

Source: WHO Global Burden of Disease Database, 2002

* WHO Regions do not correspond exactly with geographic regions. They are made up of countries and areas under the six WHO regional administrators.

More than half of all fire-related burn deaths occur in South-East Asia; two out of three of these deaths are among females. Women in South-East Asia have the highest rate of burn mortality worldwide, those aged 15 to 45 years account for 26% of global fire deaths and those aged 15 to 29 have a death rate of 26 per 100 000. Women in low- and middle-income regions of the Eastern Mediterranean also have high rates. Adult males in low- and middle-income areas of Europe also have very high rates of fire-related death as do children under 15 years in Africa.

In addition,

- Burns rank fourth as a cause of unintentional child injury death in the United States of America (USA).²
- Burns are the leading cause of adult deaths in the slums of Karachi (Pakistan).³
- Burns cause an estimated 1700 deaths annually in Nepal (seven deaths per 100 000 population).⁴
- House fires are the third leading cause of unintentional injury death in aboriginal communities in Greenland and North America.^{5,6}

Morbidity

House fires, conflagrations and clothing fires are responsible for most lethal events, but are much less frequent than scalds and other mild to moderate burns.

These non-lethal burns are a leading cause of morbidity, especially in communities where open flames are used for cooking, heating and lighting.^{7,8} Such non-lethal burns may require costly and prolonged hospitalisation and frequently result in disfigurement and disability.⁹

- Each year burn injuries in the USA result in about 61 000 hospitalizations.¹⁰
- More than one million people suffer from moderate to severe burns in India each year (estimate for 1982).⁹
- In France, childhood burns account for between 3% and 8% of all injuries in children and are the second cause of childhood deaths after drowning.¹¹
- In rural Nepal, burns were found to be the second most common injury. For example, of the 8% of the population estimated to be disabled in that country, 5% of those were due to burns.⁷

Global burden of disease

Using the burden of disease measure disability adjusted life years (DALYS) from the WHO Global Burden of Disease study of 2002 shows that burns rank second for women as a cause of unintentional injury. In South-East Asia the burden among women is double that from road traffic injury.

Who is affected?

Fire-related burns affect a range of groups but in particular women in Asia and the Eastern Mediterranean, as well as children, the elderly, men in particular industries and the poor. A high percentage of patients admitted to burns units world wide are children under 12 years of age. A Saudi Arabian study showed that children under twelve account for about 71% of burns admissions.¹² The elderly represent a significant percentage of burn victims and have high rates of burn death: they are often injured at home.^{13,14} Adult men in developing countries in Europe have high rates of burn death.

In some countries, females are at high risk for burns because of the use of open fires for cooking, heating and lighting, which can easily set alight the loose clothing they wear.¹⁵ Violence against women, which is related to gender inequality, is another factor.

Where do burns occur?

Burns occur mainly in the home and in the workplace.¹⁶ Most burn injuries, particularly among children and women, occur in the domestic environment. The kitchen is reported to be the most common place where children upset receptacles containing hot liquids and where women are injured by hot cooking oil or by stove explosions. Men, in both the developing and developed world, are at risk from burns in the workplace due to fire and flames, scalds, chemical burns, and electrical burns (especially due to high voltage currents).

Most burns occur in an urban environment (for example, 62% in India¹⁵ and 90% in Spain¹⁷). However, adverse consequences are more common in rural areas where inadequate pre-hospital care leads to more severe morbidities and disa-

bilities. In a rural area of South Africa, for example, the average interval from the time of the burn to arrival in the hospital was estimated to be 42 hours.¹⁸

Risk factors

Factors associated with fire-related burn injuries include substance abuse, violence, medical co-morbidities, and other social, economic and cultural factors.

Alcohol and smoking

Alcohol abuse and smoking, particularly in combination, represent the main cause of domestic fires in developed countries. For example, careless smoking accounts for one in four deaths of all fatal fires in the USA, and the combination of smoking and alcohol abuse accounts for nearly half the deaths.¹⁹

Local cultural practices

The use of open fires for cooking, heating and lighting are risk factors for burns. Domestic kerosene appliances are responsible for many burn injuries in the developing world.^{20,21,22} Loose-fitting clothing has also been associated with burn injury among women in the sub-continent.^{23,24} The use of floor-level stoves, bedside fires and flammable materials in building construction are further examples of culturally-related risk factors for burn injuries. The tandir, a typical underground oven in Turkey, is a significant cause of burns, particularly in children.²⁵ Bath-related scalds are more frequent in Japan than in any other country. This has been attributed to their lifestyle and bathing systems, as well as an increasing elderly population.²⁶

Socioeconomic status

Low socioeconomic status is a widely acknowledged risk factor for burns in both developed and developing countries.^{27–30} Overcrowded living conditions, lack of proper safety measures, and insufficient parental supervision of children are some of the factors associated with low socioeconomic status that contribute to the occurrence of burns.

Gender inequality

In some Asian countries such as Bangladesh, India and Pakistan, the disfiguring of women by throwing acid or burning them to death are frequent forms of violence against women. The reported reasons for this phenomenon, which is rooted in gender inequality, include disputes concerning marriage and dowry.³¹

Violence

A considerable number of burn injuries in children result from abuse and neglect. A review of the literature shows that child abuse by burning makes up approximately 6% to 20% of all child abuse cases and the incidence of child abuse among children hospitalized for the treatment of burns ranges from 5% to 25%.^{32,33}

The use of chemicals in assaults or as defensive weapons is a leading cause of burns in some countries, such as Jamaica.³⁴