

Health Emergency and Disaster Risk Management

INJURY PREVENTION AND TRAUMA CARE

Key Points

- Emergencies from natural, technological and societal hazards may cause large numbers of non-fatal casualties and survivors.
- Mass casualty management is the health sector's immediate priority in an emergency.
- Many of these injuries are preventable through multisectoral prevention, emergency preparedness and access to timely medical care.
- Action to maintain civil order and prevent conflict to reduce injuries and trauma that arise from inter-personal violence should be a priority.
- Organized prehospital and facility-based emergency care and systematic triage are essential to optimise resources and save lives.
- A standardized and well-rehearsed incident management system together with Standard Operating Procedures are paramount for linking site operations to health-facility based care during an emergency.



Casualties in temporary hospital, Mianzhu City, Sichuan Earthquake, 2008, WHO

Why is this important?

Acute events such as earthquakes, tsunamis and landslides, and severe weather events such as cyclones, heat waves, floods or severe cold weather, as well as technological and biological hazards can result in significant numbers of casualties.

From 1995-2015, 90% of major disasters were caused by weather related events. An estimated 606,000 lives were lost and 4.1 billion people were injured, left homeless or in need of emergency assistance as a result of weather-related disasters.¹

Globally, an estimated 1.25 million people are killed and as many as 50 million are injured each year in road crashes, of which there are a large number of mass casualty incidents. More than 90% of road traffic deaths occur in low- and middle-income countries.²

Conflict and civil unrest may also result in many trauma cases.

Mass casualties following disasters and major incidents are often characterized by a quantity, severity, and diversity of injuries that can rapidly overwhelm the ability of local medical resources to deliver comprehensive and definitive medical care.

Casualties associated with natural disasters, particularly rapid-onset disasters, are overwhelmingly due to:

- blunt trauma
- crush-related injuries
- drowning
- mental health issues

Most people affected by disasters do not die and many deaths and long-term consequences for casualties are preventable with timely and appropriate intervention.

Example: Haiti earthquake (2010)

The Haiti earthquake created 300,000 non-fatal casualties. Approximately 60% of persons presenting to field hospitals required surgical intervention, of which 80% involved debridement of wounds and dressings.³

©Copyright 2017

What are the health risks?

Immediately after a disaster, severe trauma and wounds are the most urgent priority for medical management. Maternal and new-born emergency care as well as mental health effects are other facets of these situations.

Following the trauma caused by the immediate event (e.g. crush injury from collapsing buildings, drowning in floods and tsunamis) additional morbidity and mortality is often the result of the destruction of or damage to infrastructure and transport-related accidents, though violence and civil unrest can also be a follow-on cause.

Drowning risks increase with floods particularly in low- and middle-income countries where people live in flood prone areas and the ability to warn, evacuate, or protect communities from floods is weak. Travel by migrants or asylum seekers on overcrowded, unsafe vessels lacking safety equipment or operated by untrained personnel is particularly hazardous.⁴ Drowning is an ongoing risk while water levels remain elevated – common mechanisms include driving of vehicles in flooded areas and individuals who are swept into drains.

Following the Gujarat earthquake in 2001, the most commonly injured areas were (most to least common):

- lower extremity
- spinal and pelvic
- upper extremity
- chest and/or abdomen
- crush syndrome

Early interventions are critical for survival and reduced health impacts. It is vital that care begins at the site, e.g. during search and rescue, which is nowadays more and more medicalised. First aid and essential surgical care capacities at local level can help to reduce trauma morbidity, mortality and disability in the short- and long-term.

Risk management considerations

Governments and communities can reduce and manage risks to people's health in disasters through proper multisectoral planning of actions designed to prevent injuries and provide trauma care in mass casualty situations. This includes:

- Safe construction and proper maintenance of housing, health facilities and other buildings, and road safety measures.
- Communication of information about risks to the public to promote personal and organizational safe behaviours, including responding to warnings, safe evacuations, shelter plans and protection from extreme events (e.g. earthquakes, floods, tsunami).
- Maintaining civil order and preventing conflict in order to reduce injuries and trauma that arise from inter-personal violence.

- Teaching children basic swimming and water safety, and enforcing safe boating and ferry regulations.

Local response and infrastructure management can help reduce mortality and morbidity in the initial post impact period through:

- Identification, assessment and monitoring disaster risks related to trauma and mass casualty management.
- Enhancing early warning systems, including links with meteorological services, provision of ongoing advice regarding hazards over the full course of an event, and a responsive community.
- Community first aid and search and rescue, which are the first line of the community response to mass casualty events.
- A standardized and well-rehearsed incident management system, including specialized training for response personnel.
- Strengthening pre-hospital and hospital systems to ensure the best outcomes for those severely injured.^{5,6}
- Ensuring robust and prepared emergency care systems prior to events to mitigate the risk of health system collapse, and ensure access to basic services for acute illness and injury is maintained during and after an event.⁷
- Essential surgery and emergency care capacity at a local level to ensure that injured patients receive immediate life-saving treatment.
- Ensuring availability of emergency care for mothers and the new-born.
- Provision of psychosocial support for the affected community, and management of mental health effects.
- Maintenance of good communication to minimize disruptions to response and social support measures, prevent further injury, and maximize effective response outcome.
- Rapid and timely deployment of trained personnel to needed areas.
- Early access to rehabilitation and assistive products, with coordination and referral for appropriate follow-up.

References

1. WHO. Road traffic injuries. WHO Media Centre Fact Sheet, 2017.
2. CDC. Post-Earthquake Injuries Treated at a Field Hospital—Haiti, 2010. MMWR 2011;59:1673-1677.
3. WHO. World Health Report 2004. http://www.who.int/whr/2004/media_centre/en/index.html
4. WHO. Global report on drowning: preventing a leading killer, 2014. http://www.who.int/violence_injury_prevention/global_report_drowning/en/ & WHO. Preventing drowning: An implementation guide, 2017.
5. Disaster Management Guidelines, WHO. Available at: <http://www.who.int/surgery/publications/EmergencySurgicalCareinDisasterSituations.pdf>
6. WHO. Mass Casualty Management Systems: Strategies and guidelines for building health sector capacity. 2007. Available at: http://www.who.int/hac/techguidance/MCM_guidelines_inside_final.pdf
7. WHO Emergency Care System Framework. Available at <http://www.who.int/emergencycare>