

**Health impacts of windstorms**

Goldman A, Eggen B, Golding B, Murray V. The health impacts of windstorms: a systematic literature review. Public Health 2013

Windstorms significantly impact human health. This systematic review includes published literature of the direct effects to health during a windstorm, and indirect effects of the pre-, during and post-impact phases of windstorms. The public health advice given can reduce mortality and morbidity from windstorms. The review summarises advice for members of the public and health and social care services. For example, the public need to be made aware of the risks of carbon monoxide poisoning from generators used indoors because of power outages, fires caused by candles, electrocution while repairing electrical lines and infection, and psychological and mental health impacts.

**Post-impact health issues for members of the public**

- Danger from alternative energy sources used during power outages. Fossil fuel powered generators should never be operated in confined spaces, due to the risk of carbon monoxide poisoning.
- Using candles as light sources during power outages can cause burns and fires. Candles should be used with care and avoided if possible.
- Fallen power lines can cause electrocution when they occur and during their repair.
- Injuries, in particular puncture wounds in the lower limbs, are common during the clean-up period after a storm. People must be vigilant to avoid injury from loose tree branches or building structures that may fall during recovery operations.
- Wounds sustained during the storm may become infected.
- If insect numbers increase, the risk of stings may rise.

**Health impacts from windstorms for health and social care services**

- Disruption to transportation and healthcare provision may impact on patients with chronic diseases, due to limited access to care and medication.
- Patients who are reliant on electricity for medical needs, such as oxygen for chronic respiratory diseases, refrigerated insulin for diabetes mellitus, and dialysis for chronic kidney disease can be affected directly by power outages.
- Healthcare professionals need to consider carbon monoxide poisoning in the differential diagnosis of patients presenting with non-specific symptoms after power outages.
- A greater number of patients with fractures, strains, sprains, lacerations, contusions or puncture wounds may be expected.
- Arrangements for appropriate prioritisation is needed, because demand on healthcare services may increase at a time when resources are limited and disrupted.

## **Flooding and mental health**

Stanke C, Murray V, Amlôt R, Nurse J, Williams R. The Effects of Flooding on Mental Health: Outcomes and Recommendations from a Review of the Literature. PLOS Currents Disasters 2012

An important lesson from past floods is how floods can have a great impact on people's psychosocial and mental health. The health impact from flooding can exacerbate existing mental health problems and produce new mental health disorders (anxiety and depression), post-traumatic stress disorders and suicide.

**Key themes** from guidance on planning, designing and delivering healthcare response are:

- Importance of adopting a multi-sector approach to promoting wellbeing and recovery involving communities and other agencies.
- Most people affected by flooding are remarkably resilient.
- Many people affected by flooding face psychosocial challenges due to distressing experiences for which they require psychosocial support. The need for such support should be anticipated.
- Whilst most people's psychosocial needs are met by people who are close to them, some people need more substantial psychosocial care. Methods based on the principles of psychological first aid are appropriate.
- A substantial minority of people affected by flooding are at risk of developing a mental disorder requiring healthcare services.
- The Strategic Stepped Model of Care can allow planners to take into account sources of personal and collective social support, and how healthcare responses to events should be deployed. It allows psychosocial and mental healthcare to be planned and delivered in integrated ways.

### **Core findings and recommendations**

1. Understand the stressors inflicted upon people by floods and how they cause short-term distress in many people, influence their medium- and longer-term wellbeing, and affect the mental health of individuals and populations.
2. Primary stressors are inherent in all disasters and encompass any experiences that people have which are directly related to, or consequent on their exposure to a disaster.
3. A majority of people experience distress after disasters. Personal and collective psychosocial resilience are inherent in populations, and families. Communities and non-statutory and statutory services can offer protection for people against psychosocial distress during and after extreme events.
4. Secondary stressors follow from or are consequential on primary stressors. They include infrastructure failure and challenges to people, families and communities returning to normal, repairing buildings or failing to adjust to a new set of living circumstances, after the disaster.
5. People's experiences can be shaped by the timeliness and their experience of post-disaster care. The delivery of public health interventions should take this into account.
6. People's psychosocial distress and recovery in the aftermath of a flood tends to endure for some time. This is due to secondary stressors from the clean-up, recovery and rebuilding phases. Some people may develop sustained dysfunction and mental disorders *de novo* or from pre-existing conditions which endure and need support from specialist mental health services for a considerable period of time after the secondary stressors have been resolved.

Although flooding affects people of all ages, the review found very few studies of the mental health impacts of flooding on children.

<p><b>Infectious diseases and flooding</b></p> <p>Brown L, Murray V. Examining the relationship between infectious diseases and flooding in Europe: A systematic literature review and summary of possible public health interventions. Disaster Health 2013</p>	<p>This review identifies routes of infectious disease transmission following flooding. It examines what evidence-based public health interventions are used to minimise infectious disease. Because floods cause population displacement and changes in population density concerns of waste management, access to clean water and availability to healthcare services are a priority. Public health interventions to reduce vulnerability of infectious diseases take place at the individual, household, community, regional, national, and international levels.</p> <p><b><u>Diseases most likely to increase due to flooding</u></b></p> <ul style="list-style-type: none"> <li>• 0-7 days: Waterborne diseases, due to the transportation of bacteria, parasites and viruses into water systems.</li> <li>• 1-4 weeks: Rodent-borne diseases, due to the altered patterns of human-pathogen-rodent contact.</li> <li>• &gt;4 weeks: Vector-borne diseases, due to receding flood waters provided ideal breeding habitats.</li> </ul> <p>Infectious disease outbreaks can happen months after the flooding event, for example, leptospirosis outbreaks have been recorded up to seven months later. Infectious diseases after flooding can be prevented by ensuring that there is sufficient clean water and adequate shelter, sanitation, hand-washing, food storage and control of disease vectors.</p> <p><b><u>Public Health measures to decrease disease risk</u></b></p> <p><b><u>Data for risk assessment</u></b></p> <ul style="list-style-type: none"> <li>• A rapid disease risk assessment and data collection should be conducted by a multi-agency group within the first week of the flood. Hand-held devices to let workers enter and analyse data in the field can assist rapid risk assessment. Relevant data include location and numbers of displaced persons, the main disease threats and priority interventions.</li> </ul> <p><b><u>Enhanced surveillance systems</u></b></p> <ul style="list-style-type: none"> <li>• Existing disease surveillance systems can be enhanced to target specific diseases or syndromes and to support timely actions to reduce disease impact and risk of disease transmission.</li> <li>• Public health teams need to establish disease surveillance systems which can cope with the inherent disruption of public health infrastructure from the flood.</li> <li>• Enhanced surveillance systems should be adaptable and context-specific, monitor key epidemiological data, compare with baseline data, monitor vulnerable groups, identify emerging outbreaks, and lead to timely public health action.</li> </ul> <p><b><u>Prevention and control measures</u></b> depend on the type of infectious disease risk. The following should be considered:</p> <ul style="list-style-type: none"> <li>• Water and sanitation are vital elements in the transmission of waterborne diseases; hence, providing clean drinking water is an urgent priority. One study found that household interventions were more effective in preventing diarrhea than interventions at the water-source. Household level interventions include chlorination, filtration, solar disinfection, and combined flocculation and disinfection. Hand-washing interventions can reduce diarrhea episodes by one-third.</li> <li>• Provision of adequate shelter, food and maintaining access to health services.</li> <li>• Rodent control needs to be considered. The local rodent species and their behaviours should be identified, water and food storage containers should be rodent-proofed, and solid waste should be properly stored, collected, and disposed of. One study suggested that planning for prompt and vigilant fever surveillance, rodent</li> </ul>
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	<p>control and improvement of environmental sanitary conditions may help reduce the incidence of leptospirosis.</p> <ul style="list-style-type: none"><li>• Vector control can reduce disease transmission by rendering the environment unfavorable for the survival and reproduction of the vector. Establishing surveillance to detect new vector species could contribute substantially to vector-control. Vectors responsible for local disease transmission, the factors that influence transmission, location of breeding site, and control measures should implemented. Local destruction of breeding sites after flooding has receded is extremely effective, so individuals should remove discarded containers containing stagnant water when possible.</li><li>• For some diseases and in some circumstances, mass vaccination campaigns may be considered.</li></ul>
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**Secondary stressors and extreme events and disasters**

Lock S, Rubin GJ, Murray V, Rogers MB, Amlôt R, Williams R. Secondary Stressors and Extreme Events and Disasters: A Systematic Review of Primary Research from 2010-2011. PLOS Currents Disasters 2012

This review examined the importance of understanding people's responses to disasters, to give a better understanding of the resilience in a population. It highlights that stressors can be avoided or modified during the response phase. Unlike previous work focusing on primary stressors, the review identified types of secondary stressors due to long-term impacts of extreme weather events which can lead to mental disorders. It developed a typology of secondary stressors to help identify these stressors and effective interventions:

**Economic**

- Loss of income and employment and decrease in house values.
- Difficulties with compensation, lack of help, advice and difficulties understanding the application process to insurers and providers of grants or loans for repair or rebuilding.
- Conflicting information and delays regarding insurance or grant/loan entitlement.
- Problems with recovery and rebuilding of homes.
- Continuing lack of essential service.
- Progressive post-flood damage to houses.
- Long term relocation to temporary accommodation.
- Dealing with daily life and recovery processes.
- Loss of possessions or resources, such as car, furniture, appliances and clothing, including items of sentimental value.

**Health**

- New or continuing health concerns or conditions.
- Lack of access to health or social care, or prescription medication.

**Education and Schooling**

- Lack of education opportunities or facilities.
- Loss of socialisation that is part of attending school.
- Changing schools.

**Media**

- Exposure to negative media reports.

**Familial**

- Breakdown of relationships and loss of intimacy.
- Breakdown of household activities and functioning.
- Breakdown of familial resilience.
- Changes to household composition.
- Parental psychopathology.
- Impact on parenting skills.
- Physical and mental abuse and neglect of partners or children.

**Social, leisure and recreation**

- Physical separation from friends and peers.
- Disruption to social networks and relationships.
- Reduction in social support.
- Disruption to leisure and recreational activities.

**Changes in the view of the world or oneself**

- Loss of control and agency.
- Loss of aspirations for the future.
- Fear of recurrence of an extreme event.