

FLOODING

– Frequently Asked Questions

What are different types of flooding?

- River flooding: River flooding occurs when heavy rains or rapid snowmelt cause rivers to rise.
- Coastal flooding: Coastal flooding may occur due to tidal surges and flash flooding.
- Flash Floods: Flash floods usually result from intense storms dropping large amounts of rain within a brief period.
- Dam Failure: Dam failures are potentially the worst flood events. When a dam fails, a gigantic quantity of water is suddenly let loose downstream, destroying anything in its path.

What are the dangers of flooding?

Location	Danger
Urban and rural	Humans that get caught in the high velocity flood waters often drown in the water.
	Floodwaters can concentrate garbage, debris, and toxic pollutants that can cause the secondary effects of health hazards.
	Drinking water supplies may become polluted, especially if sewerage treatment plants are flooded. This may result in disease and other health effects.
	The affected communities living in temporary shelters/ resettlements have limited or no access to safe drinking water, food etc. In addition, prevailing unhygienic sanitary conditions make it conducive for spread of food and waterborne diseases.
	Hypothermia may also be a problem, particularly in children, if trapped in floodwaters for lengthy periods. There may also be an increased risk of respiratory tract infections due to exposure (loss of shelter, exposure to flood waters and rain).
	Effects on mental health include excessive grief, sleep disorders, exacerbation of existing illness, death wish and suicidal ideation.
	Reproductive Health - Pregnant mothers and newborns become vulnerable and require additional care.
Urban	Massive amounts of erosion can be caused by flood waters. Such erosion can undermine bridge structures, levees, and buildings causing their collapse.
	Water entering human built structures cause water damage. Even with minor flooding of homes, furniture is ruined, floors and walls are damaged, and anything that comes in contact with the water is likely to be damaged or lost. Flooding of automobiles usually results in damage that cannot easily be repaired.
	Gas and electrical service may be disrupted.
Rural	Flooding of farmland usually results in crop loss. Livestock, pets, and other animals are often carried away and drown.
	Transportation systems may be disrupted, resulting in shortages of food and clean-up supplies. In under developed countries food shortages often lead to starvation.

Effects of flooding on health

Direct effects

Causes	Health Implications
Stream flow velocity; topographical features; absence of warning; rapid speed of flood onset; deep flood waters; landslides; risky behaviour; fast-flowing waters carrying boulders and fallen trees	Drowning; Injuries
Contact with water	Respiratory diseases; shock; hypothermia; cardiac arrest
Contact with polluted water	Wound infections; dermatitis; conjunctivitis; gastrointestinal illnesses; ear, nose and throat infections; possible serious waterborne diseases
Increase in physical and emotional stress	Increased susceptibility to psychosocial disturbances and cardiovascular incidents

Indirect effects

Causes	Health Implications
Damage to water supply systems; damage to sewerage and sewage disposal systems; insufficient supply of drinking-water; insufficient supply of water for washing	Possible waterborne infections (enteropathogenic <i>E. coli</i> , <i>Shigella</i> , hepatitis A, leptospirosis, giardiasis, campylobacteriosis); dermatitis; conjunctivitis
Disruption of transport systems	Food shortages; disruption of emergency response
Disruption of underground piping; dislodgment of storage tanks; overflow of toxic waste sites; release of chemicals; disruption of petrol storage tanks, possibly leading to fire	Potential acute or chronic effects of chemical pollution
Standing water; heavy rainfall; expanded range of vector habitats	Vectorborne diseases
Rodent migration	Possible rodent-borne diseases
Disruption of social networks; loss of property, jobs and family members and friends	Possible psychosocial disturbances
Clean-up activities following flooding	Electrocution; Injuries; lacerations; puncture wounds
Destruction of primary food products	Food shortages
Damage to health services; disruption of "normal" health service activities	Decrease in "normal" health care services; Insufficient access to medical care

Source: MENNE, B. ET AL. *Floods and public health consequences, prevention and control measures*. New York, United Nations. 2000 (document MP.WAT/SEM.2/1999/22).

What are the diseases related with flooding?

Floods can potentially increase the transmission of the following communicable diseases:

- Water-borne diseases, such as typhoid fever, cholera, leptospirosis and hepatitis A;
- Vector-borne diseases, such as malaria, dengue and dengue hemorrhagic fever, yellow fever, and West Nile Fever;
- Food-borne diseases.

What are the water-borne diseases associated with flooding?

The major risk factor for outbreaks associated with flooding is the contamination of drinking-water facilities. There is an increased risk of infection of water-borne diseases contracted through direct contact with polluted waters, such as wound infections, dermatitis, conjunctivitis, and ear, nose and throat infections. The only epidemic-prone infection which can be transmitted directly from contaminated water is leptospirosis. Transmission occurs through contact of the skin and mucous membranes with water, damp soil or vegetation (such as sugarcane) or mud contaminated with rodent urine.

Which are the vector-borne diseases associated with flooding?

Floods may indirectly lead to an increase in vector-borne diseases through the expansion in the number and range of vector habitats. Standing water caused by heavy rainfall or overflow of rivers can act as breeding sites for mosquitoes, and therefore enhance the potential for exposure of the disaster-affected population and emergency workers to infections such as dengue, malaria etc.

Which are the food-borne diseases associated with flooding?

Food in affected areas may become contaminated and consequently be at risk for outbreaks of food-borne disease, including diarrhea, dysentery, cholera, hepatitis A, and typhoid fever. Poor sanitation, including lack of safe water and toilet facilities and lack of suitable conditions to prepare food can lead to mass outbreaks of food-borne disease.

What measures can be taken towards water safety?

- For point-of-use or household water treatment, the most practical forms of free chlorine are liquid sodium hypochlorite, solid calcium hypochlorite and bleaching powder (chloride of lime; a mixture of calcium hydroxide, calcium chloride and calcium hypochlorite).
- The amount of chlorine needed depends mainly on the concentration of organic matter in the water and has to be determined for each situation. After 30 minutes, the residual concentration of active chlorine in the water should be between 0.2-0.5 mg/l, which can be determined using a special test kit.
- Drinking water should be stored in clean, covered and narrow mouthed containers.
- Use only tap or ladle to draw water if stored in a wide-mouthed container.

What measures can be taken to ensure food safety?

- Avoid raw and uncooked food unless it can be peeled or shelled.
- Cook food thoroughly and eat it while still hot.
- Cooked food should not be stored for a long time. Keep the food covered and reheat it thoroughly before consuming

How can vector-borne diseases be prevented?

- Insecticide treated mosquito nets (ITN) are suitable if nets were previously used by the population, and if living in structures that allow mosquito nets to be supported or hung.
- Indoor spraying with residual insecticide ("house spraying") is the method of control most often used.
- Insecticides: implementation of preventive measures such as indoor residual spraying, or the re-treatment / distribution of Insecticide Treated Nets (ITNs) in areas where their use is well-known.