



# Cold waves and cold weather

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## Key facts

- A cold wave is marked by a drop of average temperature well below the seasonal norms of a region. It can be preceded or accompanied by significant winter weather events, such as blizzards or hailstorms.
- In addition to significant health impacts, cold waves have an important impact on crops, livestock, disruption of services and infrastructure, power and supplies.
- Climate change is related to a global increase in temperatures and extreme weather events, including cold waves and other extreme cold weather events.
- Extreme cold weather events are common in Europe and have recently happened in places where temperatures are normally much higher (e.g. Texas in the USA in 2021).

## Main health impacts

Health concern	Risk factors
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<p><b>Cold-related conditions:</b></p> <ul style="list-style-type: none"> <li>• <b>Hypothermia:</b> Is defined when body temperature falls below 35°C (95F), which most commonly is caused by cold weather or cold-water immersion. Hypothermia can range from mild to severe. Different stages of hypothermia exist (shivering, decreased skin temperature and loss of motor skills). Some may progress to severe hypothermia where the person’s heart rate and breathing slows down. In some cases when prompt treatment is not provided, abnormal heart rhythms can occur and ultimately, failure of heart and lung function leading to death.</li> <li>• <b>Frostbite:</b> Injury caused by freezing of the skin and underlying tissues, resulting in a loss of feeling and colour in the affected areas. Nose, ears, cheeks, chin, fingers or toes are most often affected. Severe frostbite can result in amputation and/or blood clots.</li> <li>• <b>Chilblain:</b> Painful inflammation of small blood vessels in the skin due to repeated exposure to cold. It can cause itching, red patches, swelling and blistering, mostly on hands and feet.</li> <li>• <b>Trench foot:</b> Injury of the feet resulting from prolonged exposure to wet and cold conditions. Symptoms include itching which can progress to numbness, foot swelling and smelling of decay. For detailed definitions and more information, see additional resources here.</li> </ul>	<ul style="list-style-type: none"> <li>• Workers in some occupations, such as agriculture, fishing and construction, may endure greater cold exposure.</li> <li>• Certain behaviours, such as alcohol abuse can increase the risk.</li> <li>• People living in precarious types of shelter or people experiencing homelessness are at higher risk.</li> <li>• People that practice winter sports, infants (below one year) and seniors (above 65 years) are also at high risk of frostbite and hypothermia when not wearing appropriate clothing.</li> </ul>
<p>Worsening of pre-existing chronic cardiovascular and respiratory diseases</p>	<ul style="list-style-type: none"> <li>• Some chronic respiratory and cardiovascular diseases are worsened by cold weather. People with cardiovascular diseases often complain of increased symptoms (e.g., angina, arrhythmias).</li> </ul>
<p>Injuries and trauma.</p>	<ul style="list-style-type: none"> <li>• Icy roads can lead to increased vehicle accidents.</li> </ul>

<p>Carbon monoxide poisoning: frequent symptoms are headache and nausea, vomiting, confusion, up to serious medical problems and even death</p>	<ul style="list-style-type: none"> <li>• The use of outdoor heating/cooking devices to get some extra warmth indoors can lead to dangerous and potentially deadly carbon monoxide (CO) poisoning. As carbon monoxide is a colourless and odourless gas and symptoms of CO poisoning are unspecific (headache, dizziness, nausea, to name some) it is often diagnosed very late or after the victim has died.</li> </ul>
<p>Increased transmission of respiratory illnesses, skin diseases and vaccine-preventable diseases</p>	<ul style="list-style-type: none"> <li>• Cold waves can lead to disruption of basic health services provision.</li> <li>• Cold weather events and the transmission of some infectious diseases are linked through changes in transmission dynamics, host susceptibility and virus survival in the environment. For example, studies have shown that cold weather is associated with greater SARS-CoV-2 transmission, leading to a higher incidence of COVID-19 diseases (see also review, 2021). Influenza outbreaks have peaks coinciding with cold and dry weather patterns (see review, 2011 and study, 2014).</li> </ul>
<p>Occupational risks: work-related accidents or injuries</p>	<ul style="list-style-type: none"> <li>• A higher risk of injury on cold days has been found among fishing, transport, electricity, gas and water distribution workers in middle and high income countries.</li> </ul>
<p>Mental health consequences</p>	<ul style="list-style-type: none"> <li>• According to the World Health Organization, climate change poses serious risks to mental health and well-being. Extreme weather events and climate change may cause high levels of anxiety, and cold weather events may lead to mood disorders.</li> <li>• Importantly, those at higher risk for these effects are people with pre-existing mental health conditions, and people in low income settings who may face compounding mental health stressors such as food insecurity or limited access to healthcare.</li> </ul>

Please visit the disaster tool “Flood” for further information on flooding and related health impacts caused by snow melting.

## Priority actions for teams with community

## and public health response capacity

<b>Immediate steps</b>	<ul style="list-style-type: none"><li>• Provide first aid and ensure ambulance transport for injured and carbon monoxide poisoned victims.</li><li>• Identify key risk factors of cold-related complaints and illness and implement prevention and preparedness activities.</li><li>• If necessary, evacuate vulnerable people from their homes to heated shelters.</li></ul>
<b>Surveillance</b>	<ul style="list-style-type: none"><li>• Activate disease early warning systems: monitor weather updates to know when cold waves and winter storms are expected.</li></ul>

### Community-based action and social mobilization

- Identify and prioritize vulnerable groups in the community. People who are more vulnerable to cold temperatures are the elderly, infants and young children, socio-economically disadvantaged people, people who have chronic diseases, malnourished people and people on the move (e.g. migrants and refugees).
- Conduct public awareness campaigns regarding cold waves, health impacts and prevention actions including:
  - Identify the emergency heat sources, such as a fireplace or stove that are properly ventilated in your surroundings. Consider mapping these places with the community.
  - Avoid using outdoor heating/cooking devices inside that do not have ventilation because of the danger of carbon monoxide poisoning and death.
  - Highlight the importance of preparing vehicles properly for winter conditions.
  - Prevent pipes from freezing (running water).
  - If necessary, make a plan to have enough supplies, such as bottled water (in case pipes freeze), food and medication (if a snowstorm is expected).
- Assist the elderly and take particular care of people living at or in care homes (e.g. organize home outreach visits).
- Take particular care of socio-economically disadvantaged people, who may be living in inadequate housing, and may have limited access to warning messages and healthcare.
- In some settings, local authorities may set up “warming centres” to serve as safe public locations for people to get relief in warmer temperatures and therefore prevent cold-related illness. Red Cross Red Crescent teams should promote the locations and importance of such centres. If necessary, teams may evacuate vulnerable people from their homes to warming centres, or Red Cross Red Crescent may run their own warming centres where local authorities do not provide the service.
- Raise public awareness about the importance of checking on livestock frequently to ensure that animals are not suffering from the cold (protect animals, provide extra food and enough water).
- Support the social mobilization component of emergency vaccination campaigns as needed (especially influenza and COVID-19).
- Organize the provision of warm clothing for migrants and refugees, and people living in shelters.
- Ensure access to mental health and psychosocial support (MHPSS) services for community members and staff/volunteers which may include (but are not limited to): regularly assessing MHPSS needs; providing information on the situation regularly in cooperation with authorities; training volunteers on the provision of psychosocial support (PSS); using mobile teams providing a range of support; embedding PSS into evacuation centre/shelter facilities; providing special support to vulnerable groups; coordinating points for further care.
- Identify in the community cases of high-risk diseases (see list of disease tools below) and refer to pre-identified health structures. This requires a prior elaboration of a referral pathway, that is, mapping of existing primary health facilities, and assessment of minimum quality care standards and accessibility (including geographic and cost-related barriers).
- Care for volunteers’ safety and well-being. Have enough drinking water and access to warming spaces in the community for Red Cross Red Crescent volunteers and staff at all branches. If available, provide warm jackets, gloves, and hats.
- Women and men can be differently affected by cold waves due to social norms and socio-economic status (e.g. in many countries, men tend to work more often in fishing and transport-related jobs than women). Therefore, community-based action may require gender-based risk and vulnerability assessments and risk planning.

## For teams with additional clinical capacity

**Please refer to the appropriate local or international guidelines for clinical management. All clinical management including the administration of any treatment should be conducted by health professionals.**

## List of important primary health care interventions

Important primary health care interventions during cold waves include the following:

- Identification, treatment and referral (if required) of cold-related complaints and conditions. Identification, referral and treatment (if possible) of carbon monoxide poisoning
- Vaccination for respiratory illnesses like influenza and COVID-19.

A checklist to assess vulnerabilities in healthcare facilities and health workforces in the context of cold waves can be found here:

WHO, 2021 *Checklists to assess vulnerabilities in health care facilities in the context of climate change: Cold waves.*

## Disease tools that may be relevant

- > Hepatitis A
- > Measles
- > Acute respiratory infections (ARI): Influenza (avian and seasonal)
- > COVID-19 disease
- > Diarrhoeal diseases
- > Hepatitis E
- > Meningococcal meningitis
- > Poliomyelitis (polio)
- > Typhoid fever