

FAQ Health risks after flooding

Update: 31-8-2021

Health risks after flooding

Climate change means that the Netherlands is expected to see more intensive rainfall more often. When the drains system is inadequate to process this water, there can be floods, with a range of health risks as a result. An assessment of these risks is important in terms of both deciding about measures to prevent flooding and decisions about mitigating negative effects in the event of a flood. Deltares has extensive expertise with flood risk management and water quality. Linking these disciplines allows us to assess health risks.

The health effects of flooding vary over time. Multiple groups of health risks peak at different points in time after a flood and they can persist for a long time. They can be classified as acute, short-term (days after a flood) and long-term (weeks to months after the flood starts).

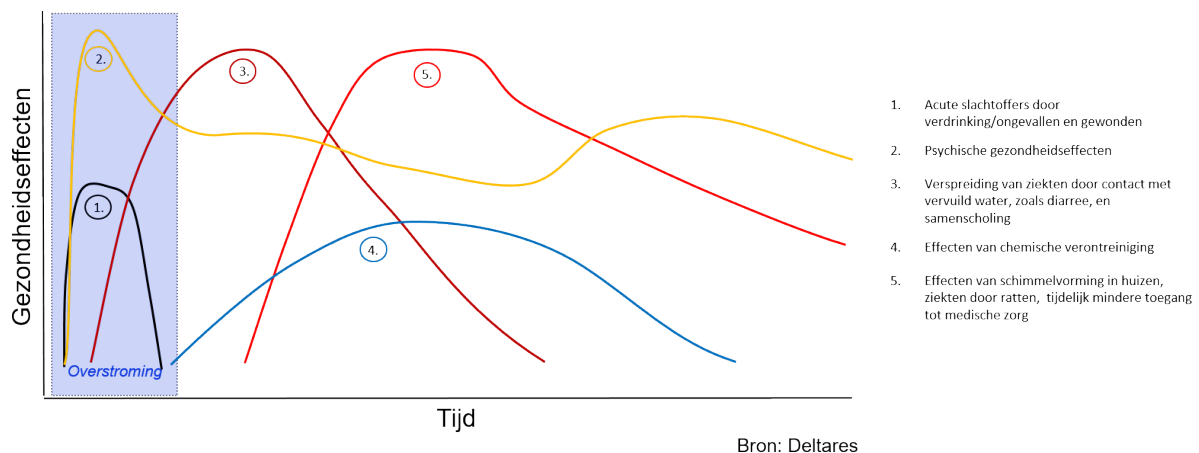


Figure: Schematic drawing showing the different categories of health effects after a flood

[In Figuur:

Linker as: Health Effects

Onder: Time Source: Deltares

In Figuur zelf: Flood

Rechter as:

1. Acute victims as a result of drowning/accident and injuries
2. Effects on psychological health
3. Spread of disease such as diarrhoea, due to contact with contaminated water and close contacts in concentrations of people
4. Effects of chemical pollution
5. Effects of formation of fungi in homes, disease transmitted by rats, temporary difficulties with access to medical care]

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Acute health effects

Acute health effects occur as the flood spreads and the land is inundated. The first effects are fatalities as a result of drowning and accidents. These fortunately remained very limited in the Netherlands in 2021. They are followed by risks such as hypothermia and injuries inflicted by loose objects.

Stress

Floods also cause a lot of stress for those directly involved. There is considerable shock, concern about missing persons, and uncertainty about not only the duration of the flood but also about basic necessities. Not everyone can turn to family or friends, and some displaced persons are sheltered at central locations. Many people will be concerned about rain and new floods.



Short-term health consequences

In the short term, there is a risk of abdominal complaints and diarrhoea as a result of the ingestion of contaminated water, for example during cleaning work. Flood water can be contaminated by pathogens when sewers, sewage treatment plants or stables with manure overflow. This is a particular risk for the elderly, young children and immunocompromised people. They dehydrate faster if they get diarrhoea. Furthermore, there can be skin problems after contact with chemically contaminated flood water, for example if a storage facility for chemical waste overflows.

Concentrations of displaced people, as in a shelter, can lead to the rapid spread of infectious diseases, including respiratory infections such as COVID-19.

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Animal and possibly human corpses can also be swept along with the water during a flood. Contact with them can also result in the transmission of a range of pathogens.

Long-term health effects

A flood involves a risk of chronic psychological problems. The stress, anxiety and uncertainty about the situation affect the psychological health of those affected from the outset of a flood and they can eventually lead to long-term problems such as depression and anxiety disorders. The relief about surviving is often followed by a second period of stress when people return to their homes and see the damage that has been done. In addition, secondary stressors such as failing infrastructure, the disrupted community and repair work (with all the potential difficulties this entails) can prolong the psychosocial impact of flooding.

Animals like rats search out higher places during a flood, such as an attic. These animals can transmit diseases. For example, rat urine and faeces can contain pathogens that pose a risk to humans. As the climate in the Netherlands gets warmer in the future, we will also have to bear in mind an increase in diseases spread by mosquitoes.

Fungi can grow on walls that stay wet; both in the flooded parts of houses and buildings, and elsewhere as a result of rising damp. The fungi can cause respiratory tract infections and problems with breathing. In addition, there is also a risk of carbon monoxide poisoning in poorly ventilated rooms when heating appliances get broken or damaged.

A compromised health infrastructure can exacerbate health risks in the long term. For example, if medicine supplies cannot be replenished at pharmacies, there will be less capacity to cope with new cases of illness, or hospital capacity may be compromised.

Reducing health risks in the future

The health risks described here have, until now, not been considered adequately in the design of measures to mitigate effects. A better understanding of the potential threats to health associated with flooding could help to make measures more effective. What these measures could consist of varies from area to area and specific evaluations are therefore required. The Deltares knowledge base relating to water depth, water flow rates, and speed at which the water rises can help to prevent possible health risks if the right steps are taken.