



# Hepatitis E

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## Key facts

To better understand public health terms included in this Disease Tool (e.g. What is a case definition? or What is an infectious agent?), consult our page on [Key concepts on epidemiology](#).

## Importance

Every year, there are an estimated 20 million *hepatitis E virus* (HEV) infections globally, and 3.3 million symptomatic cases of hepatitis E. In 2015, the WHO estimated there was 44,000 deaths globally (accounting for 3.3 per cent of the mortality due to viral hepatitis). Outbreaks usually follow periods of faecal contamination of drinking water supplies and may affect several hundred to several thousand people. Outbreaks commonly occur in situations with limited access to safe WASH and health services, including times of conflict and in population movement settings. Pregnant women in their second and third trimester are at high risk to develop a fulminant hepatitis when infected with hepatitis E virus.

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## Case definition

A **case definition** is a set of uniform criteria used to define a disease for public health surveillance. It enables public health officials to classify and count cases consistently.

*The following are standard case definitions to allow national health authorities to interpret data in an international context. However, during an outbreak case definitions may be adapted to the local context and the Red Cross Red Crescent should use those agreed/established by national health authorities. NB: Consider that during community-based surveillance, **volunteers** should use broad (simplified) case definitions (referred to as community case definitions) to recognize most or all possible cases, provide relevant risk communication and appropriate actions and encourage them to seek care. Other actors such as **healthcare workers or investigators** studying the cause of a disease, on the other hand, can use more specific case definitions that may require laboratory confirmation.*

**Presumptive case:** clinical criteria: discrete onset of an acute illness with signs/symptoms of (i) acute infectious illness (e.g. fever, malaise, fatigue) and (ii) liver damage (e.g. anorexia, nausea, jaundice, dark urine, right upper quadrant tenderness, AND/OR laboratory testing of liver function showing raised values in tests such as ALT (raised alanine aminotransferase (ALT) levels more than ten times the upper limit of normal).

**Confirmed case:** clinical criteria AND biomarker or epidemiological criteria: IgM anti-HEV antibodies positive OR epidemiological link with a confirmed case.

WHO case definition source of information:

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## Alert / epidemic threshold

An **alert threshold** is the pre-defined number of alerts that suggest the beginning of a possible disease outbreak and therefore warrant immediate notification.

**Epidemic thresholds** are the minimum number of cases indicating the beginning of a particular disease's outbreak.

An outbreak of hepatitis E is often suspected by a health worker who notices an unusual number of patients with acute jaundice syndrome within a short period of time. These patients present with one or more of the following features: similar clinical symptoms, residence in the same area or location, sharing the same water supply.

Some other features that may suggest an outbreak of hepatitis E include: one or more confirmed maternal deaths following jaundice, a recent breakdown in water quality (e.g. floods), recent population movement/displacement.

If baseline information from the same geographical area for previous years is available, it can be used to verify whether the number of cases in the present year is unusually high compared to that in previous years over the same period.

For acute jaundice syndrome in emergency settings, alert thresholds of "five or more cases with acute jaundice syndrome in one location in one to a few weeks" and of "five cases with acute jaundice syndrome or 1.5 times the baseline rate" have been suggested to help early detection of potential outbreaks of hepatitis E.

## Risk factors

- Poor sanitary conditions and hygienic practices like lack of handwashing or toilet facilities.
- Areas of conflict and humanitarian emergencies where sanitation and safe water supply pose special challenges and settings are crowded.
- Water contaminated with human faeces, for example from sewage, septic tanks and latrines, is a source of infection.
- Food when prepared or stored in unhygienic conditions.
- Unsafe domestic water storage and handling.
- Fish and seafood from human waste polluted water.
- Injecting drugs.
- Travelling to areas of high endemicity.

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## Attack rate (AR)

The **attack rate** is the risk of getting a disease during a specific time period (such as during an outbreak).

**Attack rates will vary from one outbreak to another. In case of an outbreak, consult the latest information provided by health authorities.**

During the outbreaks, overall attack rates have varied widely from one per cent to above 15 per cent.

## Groups at increased risk of severe illness (most vulnerable)

- Pregnant women, particularly those in the second and third trimester.
- Persons with pre-existing chronic liver disease.
- Immunosuppressed persons such as those receiving chemotherapy, transplant recipients or HIV carriers are at risk of a more severe disease or of a progress to a chronic hepatitis.
- People with chronic diseases such as renal disease, cancer, chronic lung or liver disease and diabetes.

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## Infectious agent

**Infectious agents** are bacteria, viruses, fungi, prions and parasites. A disease caused by an infectious agent or its toxic products is defined as an infectious disease.

*Hepatitis E virus.*

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## Reservoir / host

A **reservoir of infection** is a living organism or material in or on which an infectious agent lives and/or usually multiplies. Reservoirs include humans, animals and the environment.

A **susceptible host** is a person at risk of being infected. The level of susceptibility depends on age, sex, ethnicity and genetic factors, specific immunity also depends on other factors that affect an individual's ability to resist infection or to limit its ability to cause infection.

A **zoonotic disease** or **zoonosis** is an infectious disease that has jumped from a non-human animal to humans.

Human (*hepatitis E virus* genotypes 1 and 2 have been found only in humans and are responsible for epidemics).

**Zoonotic disease:** animals – pigs, wild boar, deer (genotypes 3 and 4 circulating in several animals, responsible for sporadic cases in humans).

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## How disease is spread (modes of transmission)

Categorisation of **modes of transmission** varies from one agency to another. In addition, some infectious agents can be transmitted by more than one mode. A list of modes of transmission can be found in the key concepts to serve as guidance to better understand the diseases included in this website.

**Faecal oral transmission:** Mainly transmitted through faecal contamination of drinking water supplies. Person-to-person contact (unwashed hands, object contaminated with human waste). Food and water contaminated with human waste (stools), mainly fruits, vegetables, shellfish, ice and water. Sharing eating utensils that are contaminated.

**Vehicle-borne transmission:** Consumption of uncooked/undercooked pork or deer meat, meat products or organs (e.g. liver), transfusion of infected blood products.

**Probable congenital transmission:** Vertical transmission from a pregnant woman to her foetus.

**Probable contact transmission:** Close person-to-person contact.

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## Incubation period

This time from when infection occurs to the onset of symptoms is called the **incubation period**. It is a range of days and it can be different for each disease.

4–6 weeks (range 2–10 weeks).

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## Period of infectiousness

**Period of infectiousness** is the time interval during which an infected person can transmit the infection to other susceptible persons.

The period of infectiousness has not been clearly determined, but virus excretion in the stool has been demonstrated from one week prior to 30 days after the onset of jaundice. Chronically infected persons (for genotype 3 only) shed the virus as long as they are infected.

## Clinical signs and symptoms

- Individuals infected with hepatitis E virus often have no symptoms.
- Symptomatic infection is most common in young adults aged 15–40 years of age.
- An initial phase of mild fever, reduced appetite, nausea and vomiting, lasting for a few days; some persons may also have abdominal pain, itching (without skin lesions), skin rash or joint pain.
- Jaundice (yellow discolouration of the skin and sclera of the eyes), with dark urine and pale stools; and a slightly enlarged, tender liver (hepatomegaly).
- In rare cases (three per cent of all cases), acute hepatitis E can be severe, and results in fulminant hepatitis (acute liver failure); these patients are at risk of death. Fulminant hepatitis occurs more

frequently when hepatitis E occurs during pregnancy, up to 20 per cent of infections during pregnancy are fulminant hepatitis.

- Hepatitis E virus usually does not cause chronic disease. Some cases have been reported in immunosuppressed people.

## Other diseases with similar clinical signs and symptoms

Other viral hepatitis, yellow fever, leptospirosis, dengue fever, malaria.

## Diagnosis

- Cases of hepatitis E are not clinically distinguishable from other types of acute viral hepatitis.
- Definitive diagnosis of hepatitis E infection is usually based on the detection of specific IgM antibodies to the virus in a person's blood.

## Vaccine or treatment

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

- There is no specific treatment capable of altering the course of acute hepatitis E.
- As the disease is usually self-limiting, hospitalization is generally not required. Hospitalization is required for people with fulminant hepatitis, however, and should also be considered for symptomatic pregnant women.
- Hepatitis E vaccine is currently registered only in China for men and women aged 16—65 years. The WHO does not currently recommend its use in other countries for now and is working to develop a generic protocol for use of the hepatitis E vaccine as an outbreak response intervention (July 2021).

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## Immunity

There are two types of immunity:

- **Active immunity** results when exposure to an agent triggers the immune system to produce antibodies to that disease.
- **Passive immunity** is provided when a person is given antibodies to a disease rather than producing them through his or her own immune system.

It is still unclear whether the natural infection results in lifelong immunity or if there is a possibility for reinfection.

# Which interventions are most effective for prevention and control?

*The following is a list of activities considered for Red Cross Red Crescent volunteers to take part in. It is not an exhaustive list of all prevention and control activities for the specific disease.*

- Communicate risks about the disease or epidemic, not only to share information on prevention and mitigation measures, but also to encourage informed decision-making, positive behaviour change and maintenance of trust in the Red Cross Red Crescent response. This includes the identification of rumours and misinformation around disease—frequent during health emergencies—to manage them appropriately. Volunteers should use the most context-appropriate communication techniques (ranging from social media to face-to-face interactions).
- Community education and engagement activities to encourage the adoption of protective behaviours around water, sanitation and hygiene including:
  - Hand hygiene: handwashing with soap at critical times (before breastfeeding, after changing napkins, before cooking, before eating, after using toilets). This includes not only communication and community mobilization activities to promote handwashing with soap practices, but also when possible providing handwashing stations in public spaces (e.g. markets, schools).
  - Safe drinking water: promoting methods including chlorination and boiling water will deactivate the hepatitis E virus. Water storage containers should be protected from contamination and kept clean.
  - Food hygiene:
    - Consume properly cooked food and eat it while still hot.
    - Raw pork and venison should be avoided.
    - Plates and utensils must be kept off the ground.
    - Food must be covered and protected from flies at all times.
- Safe disposal of faeces (use of improved sanitation facilities). Latrines/toilets should be maintained clean and a handwashing device (with soap and water) must be present near the latrines.
- Distribution of essential non-food items (NFIs), including soap and water chlorination tablets (if context-appropriate).

## Epidemic characteristics and RCRC indicators and targets

*The first table below includes data that should be gathered from health authorities and relevant non-governmental actors to understand the progress and characteristics of the epidemic in the specific country and area of intervention. The second table includes a list of suggested indicators that can be used for monitoring and evaluating Red Cross Red Crescent activities; wording of indicators may be adapted to specific contexts. Target values for a specific indicator can vary widely from one context to another and therefore managers should define them based on the specific population, area of intervention and programmatic capacity. Exceptionally, some indicators in this website may include target values when these are globally agreed as a standard; e.g. 80 per cent of individuals who slept under an insecticide-treated net (ITN) the previous night—the normative World Health Organization benchmark for universal coverage with ITNs.*

## Epidemic characteristics and progression

Cases per week in total population/children under five years/pregnant women

Deaths per week in total population/children under five years/pregnant women

Case fatality rate

## Indicators for Red Cross Red Crescent activities

Number of volunteers trained on a specific topic (e.g. Epidemic Control for Volunteers (ECV); Community-based surveillance (CBS); WASH training; CBHFA training, etc.)

**Numerator:** Number of volunteers trained

Source of information: Training attendance sheets

Hepatitis E suspect cases among children under five detected by volunteers who were encouraged to seek healthcare and who arrived at a health facility (*NB. This indicator requires the implementation of a system in collaboration with the health facility, whereby health workers specifically asked the patient how they heard about the service*)

**Numerator:** Children under five who are hepatitis E suspect cases detected by volunteers in a determined period preceding this survey (e.g. two weeks) for whom advice or treatment was sought from a health facility

**Denominator:** Total number of children under five who are hepatitis E suspect cases in the same period preceding the survey

Source of information: Survey

Percentage of people recognizing at least one transmission route and at least one measure for preventing it

**Numerator:** Total number of people who recognized at least one transmission route and at least one measure for preventing it during the survey

**Denominator:** Total number of people surveyed

Source of information: Survey

Number of community members who received epidemic prevention and control material (e.g. soap, chlorination tablets, mosquito nets, IEC material)

**Numerator:** Number of community members who received materials

Source of information: Distribution lists

Percentage of households where soap or ash is available for handwashing

**Numerator:** Total households where soap or ash was available during the survey

**Denominator:** Total households surveyed

Source of information: Survey

## See also:

- For Community Engagement and Accountability (CEA) indicators for activities accompanying ECV actions, please refer to: IFRC *CEA toolkit (Tool 7.1: Template CEA logframe, activities and indicators)*. Available at: <https://www.ifrc.org/document/cea-toolkit>

## Impact on other sectors

Sector	Link to the disease
<b>WASH</b>	The presence of good sanitation and hygiene practices decreases faecal oral transmission.
<b>Food security</b>	Drinking water and water supplies contaminated with human waste can transmit hepatitis E. Raw or undercooked meat and shellfish are another transmission mode avoidable by cooking the meat or fish thoroughly using clean kitchen utensils.
<b>Nutrition</b>	Malnutrition increases the risk for severe hepatitis E disease. <a href="#">Studies</a> have shown that malnutrition during pregnancy might give a higher predisposition for hepatitis E infection, in addition to an increased risk of severity of the disease.
<b>Shelter and settlements</b>	Functional latrines with appropriate faecal sludge management and handwashing facilities are important to decrease transmission risk.  Hepatitis E outbreaks are of particular concern in population movement settings.
<b>Psychosocial support and mental health</b>	As in the case of a range of other diseases, hepatitis can have several negative impacts on psychological, social and emotional aspects of a person's life, apart from its physical effects only. Psychological reactions may include fear of social stigma, anxiety and worry about the outcome, social withdrawal, among others.
<b>Gender and sex</b>	Pregnant women are at high risk of fulminant infection when getting infected during the second and third trimesters of pregnancy. An altered status of hormones and low immunity are observed during pregnancy and might be plausible reasons for severity of the disease in this group. The psychological impact might be higher for women than men if pregnant, as pregnant women might constantly worry about becoming infected.  In many societies, women have primary responsibility for sanitation, health and water supply in the household. Women do not only ensure that there is water for drinking, but also for cooking, cleaning, caring for domestic animals, personal hygiene and caring for the sick. It is therefore key that epidemic response activities take into consideration the central role women have in water management.



Sector	Link to the disease
<p><b>Education</b></p>	<p>When schools do not have clean running water or basic toilets, these can add transmission risks in places where there are outbreaks ongoing. Children may then be at risk of getting the disease if attending classes, or at risk of losing out on education if staying at home.</p> <p>Schools and other facilities dedicated to children and youth can offer an important space for them to engage, mobilize and raise awareness around health education issues. With support, trust and appropriate capacity-building, young people can be effective advocates for the adoption of preventive measures during an epidemic and are those best placed to mobilize their peers.</p>
<p><b>Livelihoods</b></p>	<p>Illness leads to reduction in productivity as people may not be able to work due to disease. This can lead to a loss of income due to the reduction in work activity and to the diversion of resources to seek medical treatment. This can be critical for hepatitis E because the symptomatic infection is most common in young adults of working age.</p>

## Resources:

- Kumar A, Sharma S, Kar P, Agarwal S, Ramji S, Husain SA, Prasad S, Sharma S. (2017) Impact of maternal nutrition in hepatitis E infection in pregnancy. Arch Gynecol Obstet. Nov;296(5):885-895. doi: 10.1007/s00404-017-4501-y. Epub 2017 Sep 4. PMID: 28871471.
- Nishat Jilani, Bhudec C Das et al. (2007) *Hepatitis E virus infection and fulminant hepatic failure during pregnancy*. Available at: <https://pubmed.ncbi.nlm.nih.gov/17444855/>
- WHO (2021) *Hepatitis E. Fact Sheets*. Available at: <https://www.who.int/news-room/fact-sheets/detail/hepatitis-e>