

# Tsunami affected areas, 2005

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## Communicable disease risks and interventions



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## 1. CD RISK ASSESSMENT

	Sri Lanka	Indonesia	Maldives	Thailand	India
<b>Cholera</b>	+	+	–	+	+
<b>Typhoid</b>	+	+	–	+	+
<b>Shigellosis</b>	+	+	–	+	+
<b>Hepatitis A &amp; E</b>	+	+	+	+	+
<b>Dengue fever</b>	+	+	+	+	+
<b>Malaria</b>	+	+	–	no risk in main cities and tourist resorts	+
<b>Scrub typhus</b>	+	+	+	+	+
<b>Leptospirosis</b>	+	+	?	+	+
<b>ALRI</b>	+	+	+	+	+
<b>Measles</b>	+	++	+	+	+
<b>Meningitis</b>	+	+	+	+	+
<b>Tuberculosis</b>	+	+	+	+	+

**Key:** + : At risk  
 – : Not at risk  
 ? : No information available/potentially at risk

### Waterborne-diseases

There is an immediate INCREASED RISK of waterborne disease outbreaks i.e. **cholera, typhoid fever, shigellosis and hepatitis A and E**, related to unsafe drinking water and inadequate sanitation (see safe water and sanitation below). Outbreaks of these diseases could occur at any moment.

**Leptospirosis** is freshwater borne and there is no increased risk of this disease from the salty tsunami flood water unless subsequent rains and /or accumulation of garbage should lead to increased breeding of infected rodents. A (slight) increase may occur due to crowding together of rodents and humans. As the epidemiology of leptospirosis remains unpredictable, alertness for leptospirosis-induced hepatitis is important.

### Diseases related to overcrowding

Overcrowding also leads to an increased risk of **measles, influenza and meningitis** outbreaks as well as an increased incidence of **acute respiratory infection**. There is also an **immediate risk** of these diseases. **Waterborne and vector-borne disease** (see below) transmission is also increased in overcrowded conditions.

**Tuberculosis** transmission will also increase, particularly if treatment is interrupted for more than 2 weeks. Interventions for TB, however, can be addressed once emergency and basic health care is re-established.

### Vector-borne diseases

Cases of **malaria** could increase in 3-4 weeks after flooding due to mosquito breeding if stagnating salty water is turned brackish by heavy rains or fresh water from other sources.

**Dengue** is endemic in most of the affected countries, but transmission risk is increased among people living in overcrowded conditions or inadequate shelters. It will be further enhanced if people store fresh water in unprotected containers.

**Scrub typhus** is also a risk due to increased exposure to mite vectors in bushes and forests as people are displaced.

### Food-borne diseases

Following disasters such as earthquakes and floods, food in the affected areas may become contaminated and consequently contribute to outbreaks of diarrhoea and dysentery, including cholera. Hepatitis and typhoid. Poor sanitation, including lack of safe water and toilet facilities and lack of suitable conditions to prepare food have led to mass outbreaks of food borne disease. Under most conditions, the threats posed by contaminated water and food are interrelated and cannot be separated. Therefore, water should be treated as contaminated food which should also be boiled or otherwise made safe before it is consumed or used as an ingredient in food.

As persons suffering from the direct effects of the disaster may already be at risk through malnutrition, exposure, shock and other traumas, it becomes essential that the food they consume is safe. This is particularly important for foods for infants, pregnant women and the elderly who are most susceptible to food borne disease.

## **2. IMMEDIATE INTERVENTIONS**

### **2.1 Emergency medical care**

Priority must be given to providing emergency medical and surgical care people in shock and the injured, and to the provision of psychosocial support to communities.

The use of standard treatment protocols in health facilities with agreed upon first-line drugs is also crucial to ensure effective diagnosis and treatment for acute respiratory infections, malaria, sexually transmitted infections and for the main epidemic-prone diseases (including cholera, dysentery, typhoid, hepatitis, dengue, leptospirosis, measles, meningitis). Infection control guidelines should also be in place.

### **2.2 Water and Sanitation**

- Ensuring uninterrupted provision of safe drinking water is the most important preventive measure to be implemented following flooding in order to reduce the risk of outbreaks of water-borne diseases.
- Free chlorine is the most widely and easily used, and the most affordable of the drinking water disinfectants. It is also highly effective against nearly all waterborne pathogens.
  - For point-of-use or household water treatment, the most practical forms of free chlorine are liquid sodium hypochlorite, sodium calcium hypochlorite and bleaching powder.
  - 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 by using a special test kit.
- UNHCR and WHO recommend that each person be supplied with at least 20 litres of clean water per day.
- The provision of appropriate and sufficient water containers, cooking pots and fuel can reduce the risk of cholera and other diarrhoeal diseases by ensuring that water storage is protected and food is properly cooked.
- In addition, adequate sanitation facilities should be provided in the form of latrines or designated defecation areas.

### **2.3 Provision of shelter and site planning**

Shelters must be placed with sufficient space between them, in accordance with international guidelines aimed at preventing diseases related to overcrowding such as measles, respiratory infections, diarrhoeal diseases and vector borne diseases.

### **2.4 Safe food preparation**

While the importance of safe water is well-recognised in all regions of the world, the significant risk related to food is often not understood. Therefore, one of the most important preventive measures in this area is to get the message of importance of safe practices as well as what these practices are to all people involved in the preparation of food.

- The importance of safe water for the preparation of food should be emphasized as an integral part of the message related to water safety, bearing in mind that the boiling process will eliminate most microbiological but not all chemical risk.
- Guidance for crash courses of safe food preparation should be prepared for those involved in emergency food aid - such as refugee camp managers and NGOs.
- Health education targeted towards the general population should include simple measures related to food preparation (see health education section).

## **2.5 Establish early warning/surveillance system**

The early warning/surveillance system should

- Focus on the communicable diseases of public health significance most likely to appear in the flood-affected area with the objective of early detection of outbreak-prone diseases.
- Be and should be simple with standardized including standard case definitions and reporting forms.
- For malaria: it is important to track weekly case numbers and provide laboratory-based diagnosis (perhaps only for a % of fever cases to track the slide/test positivity rate), to pick up the early stages of a malaria epidemic
- Should complement existing surveillance structures and incorporate prompt investigation of any unusual events detected by the surveillance system or reports or rumours of communicable disease outbreaks.
- Support and reinforce the different national laboratory capacities and organize a laboratory network in the area to ensure prompt confirmation and diagnosis of communicable diseases of public health importance.
- Be led by one agency with a clearly identified responsible epidemiologist co-ordinating activities and liaising with all other agencies.

## **2.6 Immunization**

Immunization against vaccine-preventable diseases should be considered in the aftermath of a crisis situation to prevent epidemics and sporadic disease and death.

- Each visit to health care facilities should be seen as an opportunity to vaccinate persons regardless of the reason for the visit. Vaccinations routinely offered by the national immunization programme should be made available to all infants and other persons as part of basic emergency health care services being provided.
- In crowded settings such as camps of displaced persons or refugees, to **prevent** measles outbreaks, measles immunization, together with vitamin A supplementation, is a priority health intervention during and after emergencies. In these settings, all children 6 months through 14 years of age should receive measles vaccine, regardless of previous vaccination or disease history. At a minimum, children 6 months through 4 years of age should be immunized. The choice of ages targeted will be influenced by prior vaccination coverage, vaccine availability, funding, human resources and local measles epidemiology.
- Outside of camps, a single suspected measles case is sufficient to prompt the immediate implementation of measles **control** activities. Measles vaccine, together with vitamin A, should be made available immediately to all previously unvaccinated infants and children aged 6 to 59 months. Infants and children whose vaccination status is uncertain should also receive measles vaccine.
- Hepatitis A vaccine is not recommended to **prevent** outbreaks in the disaster area. In certain circumstances, hepatitis A vaccine can be used to **control** outbreaks. Control of hepatitis A outbreaks have been most successful in small, self-contained communities, when vaccination is started early in the course of the outbreak, and when high coverage of multiple-age cohorts is achieved. Vaccination efforts should always be supplemented by health education and improved sanitation.
- Mass tetanus vaccination programs to **prevent** disease are not indicated. However, tetanus boosters may be indicated for previously vaccinated people who sustain open wounds or for other injured people depending on their tetanus immunization history.
- Oral cholera vaccine is only recommended for populations at immediate risk of a cholera epidemic. Vaccination to **prevent** cholera outbreaks should be undertaken only in concert with other prevention and control measures currently recommended by WHO including education, safe water and sanitation. Vaccination is **not** recommended to **control** ongoing outbreaks.
- Current typhoid vaccines are not recommended for mass campaigns to **prevent** typhoid disease. Typhoid vaccination in conjunction with other preventive measures may be useful to **control** typhoid outbreaks depending on local circumstances.

## **2.7 Vector control**

- In areas of *known* malaria risk: spraying of shelters with residual insecticide and/or retreatment/distribution of insecticide-treated mosquito nets in areas where their use is well-known.
- Water storage containers should be covered to prevent them from becoming mosquito-breeding sites
- Attempts should be made to eliminate pooled water which may be gathering amongst the debris
- In areas with open fresh-water containers, larviciding is recommended to prevent breeding of dengue vectors.
- Garbage must be collected and appropriately disposed of to discourage rodent vector breeding.

## **2.8 Health Education**

### Promote good hygienic practice

- Wash hands with soap, ashes, or lime:
  - before cooking, before eating and before feeding children
  - after using the latrine or cleaning children after they have used the latrine.
- Wash all parts of hands – front, back, between the fingers, under nails.
- Minimum of 250g of soap should be available per person per month.
- Use the latrine to defecate.
- Keep the latrine clean.

### Safe water:

- Even if it looks clear, water can contain germs.
- Boil, or add drops of chlorine to the water before drinking.
- Keep drinking-water in a clean, covered pot or bucket or other container with a small opening and a cover. It should be used within 24 hours of collection.
- Pour the water from the container – do not dip a cup into the container.
- If dipping into the water container cannot be avoided, use a cup or other utensil with a handle.

### Safe food:

- Keep clean: Wash hands and sanitize equipment used for food preparation, and keep persons with symptoms of disease away from food preparation
- Separate raw and cooked food and never use same equipment for raw foods and foods that are ready-to-eat, unless you sanitize such equipment
- Cook thoroughly until food is steaming hot and eat cooked food immediately
- Keep food at safe temperatures refrigerate or keep very hot - do not leave cooked food at room temperature more than 2 hours
- Use safe water and raw materials preferably cook vegetables and peel fruits that are eaten raw, discard damaged (flooded), spoiled or mouldy food.
- "COOK IT - PEEL IT - OR LEAVE IT"

### Water sources

- Do not defecate or urinate in or near a source of drinking-water.
- Do not wash yourself, your clothes, or your pots and utensils in the source of drinking-water (stream, river, or water hole).
- Open wells must be covered when not in use to avoid contamination.
- The buckets used to collect water should be hung up when not in use – they must not be left on a dirty surface.
- The area surrounding a well or a hand pump must be kept as clean as possible.
- Get rid of refuse and stagnant water around a water source.

### Seek treatment early

Early diagnosis and treatment for fever and diarrhoea is vital (within 24 hours of onset)

If diarrhoea, a solution of oral rehydration salts made with safe (boiled or chlorinated) water should be consumed and treatment sought at a health centre.

## 2.9 Disposal of human remains

Human remains do not pose a risk of communicable disease epidemics after natural disasters. The public and emergency workers alike should be duly informed to avoid panic and inappropriate disposal of bodies. Morgue workers or those who are handling human remains should avoid contact with blood and body fluids.

- Burial is preferable to cremation in mass casualties and where identification of victims is not possible.
- The mass management of human remains is often based on the false belief that they represent an epidemic hazard if not buried or burned immediately. Bodies should not be disposed of unceremoniously in mass graves and this does not constitute a public health measure, violates important social norms and can waste scarce resources.
- Families should have the opportunity to conduct culturally appropriate funerals and burials according to social custom.
- Where customs vary, separate areas should be available for each social group to exercise their own traditions with dignity.
- Where existing facilities such as graveyards or crematoria are inadequate, alternative locations or facilities should be provided.
- The affected community should also have access to materials to meet the needs of culturally acceptable funeral pyres and other funeral rites.

For workers routinely handling human remains:

- Graveyards should be at least 30m from ground water sources used for drinking water.
- The bottom of any grave must be at least 1.5m above the water table with a 0.7m unsaturated zone. Surface water from graveyards must not enter inhabited areas.
- Ensure universal precautions for blood and body fluids.
- Ensure use and correct disposal of gloves (no re-use).
- Ensure use of body bags.
- Ensure hand-washing with soap after handling bodies and before eating.
- Ensure disinfection of vehicles and equipment.
- Bodies do not need to be disinfected before disposal (except on case of cholera).
- Vaccinate workers against hepatitis B.

For more detail on prevention see: [http://www.who.int/hac/techguidance/ems/flood\\_cds/en/](http://www.who.int/hac/techguidance/ems/flood_cds/en/) .

## 3. RELEVANT PUBLICATIONS

List of guidelines for health emergencies from SEARO (South East Asian Regional Office of WHO)  
[http://w3.who.sea.org/EN/Section23/Section1108/Section1835\\_8188.htm#coMMMDIS](http://w3.who.sea.org/EN/Section23/Section1108/Section1835_8188.htm#coMMMDIS)

### Cholera

Cholera outbreak: assessing the outbreak response and improving preparedness:

[http://www.who.int/topics/cholera/publications/cholera\\_outbreak/en/](http://www.who.int/topics/cholera/publications/cholera_outbreak/en/)

First steps for managing an outbreak of acute diarrhoea:

[http://www.who.int/topics/cholera/publications/first\\_steps/en/](http://www.who.int/topics/cholera/publications/first_steps/en/)

Acute diarrhoeal diseases in complex emergencies: critical steps:

[http://www.who.int/topics/cholera/publications/critical\\_steps/en/](http://www.who.int/topics/cholera/publications/critical_steps/en/)

### Hepatitis A

<http://www.who.int/csr/disease/hepatitis/whocdscsredc2007/en/>

### Hepatitis E

<http://www.who.int/csr/disease/hepatitis/whocdscsredc200112/en/>

<http://www.who.int/mediacentre/factsheets/fs280/en/>

### Leptospirosis

[http://www.who.int/water\\_sanitation\\_health/diseases/leptospirosis/en/](http://www.who.int/water_sanitation_health/diseases/leptospirosis/en/)

### Dengue

[http://w3.who.sea.org/EN/Section23/Section1108/info-kit/WHO-Fact\\_Sheet\\_on\\_Dengue.pdf](http://w3.who.sea.org/EN/Section23/Section1108/info-kit/WHO-Fact_Sheet_on_Dengue.pdf)

Dengue haemorrhagic fever: diagnosis, treatment, prevention and control:

<http://www.who.int/csr/resources/publications/dengue/Denguepublication/en/>

Tsunami affected areas, 2005: Communicable disease risks and interventions.

### **Malaria**

<http://www.mosquito.who.int/malariacontrol>

Malaria epidemics: forecasting, prevention, early detection and control. From Policy to Practice:

<http://mosquito.who.int/docs/Leysinreport.pdf>

Malaria vector control. Insecticides for Indoor Residual Spraying:

[http://whqlibdoc.who.int/hq/2001/WHO\\_CDS\\_WHOPES\\_2001.3.pdf](http://whqlibdoc.who.int/hq/2001/WHO_CDS_WHOPES_2001.3.pdf)

Manual for Indoor Residual Spraying. Applications of Residual Sprays for Vector Control:

[http://whqlibdoc.who.int/hq/2000/WHO\\_CDS\\_WHOPES\\_GCDPP\\_2000.3.Rev.1.pdf](http://whqlibdoc.who.int/hq/2000/WHO_CDS_WHOPES_GCDPP_2000.3.Rev.1.pdf)

Instructions for treatment and use of Insecticide-treated Mosquito nets:

[http://mosquito.who.int/cmc\\_upload/0/000/016/007/InstructionsITNen1.pdf](http://mosquito.who.int/cmc_upload/0/000/016/007/InstructionsITNen1.pdf)

### **Measles**

WHO guidelines for epidemic preparedness and response to measles outbreaks:

[http://www.who.int/csr/resources/publications/measles/WHO\\_CDS\\_CSR\\_ISR\\_99\\_1/en/](http://www.who.int/csr/resources/publications/measles/WHO_CDS_CSR_ISR_99_1/en/)

### **Meningitis**

Control of epidemic meningococcal disease. WHO practical guidelines:

[http://www.who.int/csr/resources/publications/meningitis/WHO EMC BAC 98\\_3 EN/en/](http://www.who.int/csr/resources/publications/meningitis/WHO EMC BAC 98_3 EN/en/)

### **Laboratory specimen collection:**

[http://www.who.int/csr/resources/publications/surveillance/WHO\\_CDS\\_CSR\\_EDC\\_2000\\_4/en/](http://www.who.int/csr/resources/publications/surveillance/WHO_CDS_CSR_EDC_2000_4/en/)