Technical note:

Post-tsunami flooding and communicable disease risk in affected Asian countries

World Health Organization

Communicable Disease Working Group on Emergencies, WHO/HQ

1. RISK ASSESSMENT

	Sri Lanka	Indonesia	Maldives	Thailand	India
Cholera	+	+	–	+	+
Typhoid	+	+	–	+	+
Shigellosis	+	+	–	+	+
Hepatitis A & E	+	+	+	+	+
Dengue fever	+	+	+	+	+
Malaria	+	+	–	Unlikely in south	Unlikely in south
Scrub typhus	+	+	+	+	+
Leptospirosis	+	+	?	+	+

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

Diseases of immediate concern:
There is an immediate INCREASED RISK of waterborne diseases 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.

Diseases posing threats in 3-4 weeks:
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.

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

Diseases related to overcrowding:
There is an increased risk of **measles, influenza and meningitis** outbreaks as well as increased incidence of **acute respiratory infection**. Diarrhoeal diseases and vector-borne diseases are also increased in overcrowded conditions. 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.

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.

Diseases related to rains and flooding/and or accumulation of refuse:
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.

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.
- 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 food

2.4 Site Planning and Shelter

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.

2.5 Immunization

- A single suspected measles case is sufficient to prompt an immediate immunization response. Life-saving measles vaccine should be made available immediately targeting all infants and children 6-59 months of age. The suggested target age group may be expanded up to 15 years, if feasible, in areas where there is substantial crowding.
- Each visit to health care facilities should be seen as an opportunity to vaccinate for routine EPI regardless of the reason for the visit. Vaccination program activities should be included as part of basic emergency health care services being is re-established.
- Mass vaccination against cholera and typhoid fever is not recommended. The most practical and effective strategy to prevent cholera and typhoid is to provide clean water in adequate quantities and adequate sanitation. Sufficient soap and hygiene education will further prevent the transmission of both diseases.
- Mass tetanus vaccination programs 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.
- Mass vaccination for Hepatitis A is not recommended.

2.6 Establish EWARN/surveillance system

The EWARN/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.
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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 and social mobilization

- Promote good hygienic practice.
- Ensure safe food preparation techniques.
- Ensure boiling or chlorination of water.
- Minimum of 250g of soap available per person per month.
- Vital importance of early diagnosis and treatment for fever (within 24 hours of onset)

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.

3. RELEVANT PUBLICATIONS

Cholera
http://www.who.int/topics/cholera/publications/cholera_outbreak/en/
http://www.who.int/topics/cholera/publications/first_steps/en/
http://www.who.int/topics/cholera/publications/critical_steps/en/

Hepatitis A and E
http://www.who.int/csr/disease/hepatitis/whocdscsredc2007/en/
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/

Dengue
http://www.who.int/csr/disease/dengue/en/
http://www.who.int/csr/resources/publications/dengue/Denguepublication/en/

Malaria
http://mosquito.who.int/docs/Leysinreport.pdf
http://whqlibdoc.who.int/hq/2001/WHO_CDS_WHOPES_2001.3.pdf
http://whqlibdoc.who.int/hq/2000/WHO_CDS_WHOPES_GCDPP_2000.3.Rev.1.pdf

Measles
http://www.who.int/csr/resources/publications/measles/WHO_CDS_CSR_ISR_99_1/en/

Meningitis
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/