

South Asia earthquake-affected areas, 2005

Communicable disease risks and interventions



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For more information please contact:

The Programme on Communicable Diseases in Humanitarian Emergencies
Communicable Diseases Cluster
World Health Organization
20 Avenue Appia
1211 Geneva-27
Switzerland
E-mail: cdemergencies@who.int.

PREFACE

The purpose of the *South Asia earthquake-affected areas: Communicable diseases risk and interventions* technical note is to provide health professionals in United Nations agencies, nongovernmental organizations, donor agencies and local authorities working in the earthquake-affected areas with up-to-date **priority** concerns with regard to the major communicable disease threats faced by the homeless and displaced population. The list of endemic and epidemic-prone diseases has been selected on the basis of the burden of morbidity and mortality in the area previously documented by WHO.

The prevention and control of communicable diseases represents a major challenge to those providing health-care services in post-disaster situations. It is hoped that this technical note will facilitate the coordination of communicable disease control activities between all agencies working in the South Asia earthquake-affected areas.

EXECUTIVE SUMMARY

The powerful earthquake that struck Pakistani Kashmir, near the Indian border, caused tens of thousands of deaths and injuries and severely damaged the existing infrastructure. The massive societal disruption and displacement that follow can increase the risk of communicable disease transmission. The main concern is for those made **homeless** and the **large displaced population**. The combination of poor shelter, overcrowding, disruption to water and sanitation services, and high pre-existing rates of undernutrition, can place vulnerable people at even greater risk of illness.

Given the low measles vaccination coverage (approximately 60%), **measles** outbreaks with high mortality rates can be expected if vaccination is not implemented immediately. Antibiotics should be ensured for treatment of **pneumonia**, which is a leading cause of morbidity and mortality in displaced populations. **Diarrhoeal diseases** will be of concern if safe water and adequate sanitation are not provided. In addition, **tetanus** anti-toxin should be given to the injured and wounds properly managed to avoid infections. **Prevention of overcrowding** and provision of **safe water and sanitation** can prevent much of the burden of communicable diseases in this disaster. A **disease surveillance/early warning and response system** with adequate preparedness is crucial for early detection and control of potential outbreaks. Continuation of ongoing **TB treatment** should particularly be ensured as interruptions in treatment can facilitate transmission in camps. **Essential medical supplies** should be available and sufficient quantities pre-positioned locally and regionally.

In addition, appropriate medical treatment for chronic non-communicable diseases and emergency obstetric care must be available.



1. COMMUNICABLE DISEASES RISK ASSESSMENT

	Pakistan	Afghanistan	India
ALRI	+	+	+
Crimean-Congo HF	+	+	+
Cholera	?	++	++
Dengue	+	+	+
Diphtheria	+	+	+
Hepatitis A & E	+	+	+
Hepatitis B	++	?	?
Japanese encephalitis	+	+	+++
Leptospirosis	+	+	+
Leishmaniasis	+	+	+
Malaria	+	+	+
Measles	++	++	++
Meningitis	+	+	+
Pertussis	+	+	+
Poliomyelitis	+	+	+
Rabies	+	+	+
Typhoid fever	++	++	+
Typhus	+	?	+
Shigellosis	++	++	+
Tetanus	+	+	+
Tuberculosis	+	+	+

Key: + : At risk - : Not at risk ? : No information available; potentially at risk

Diseases related to overcrowding

Overcrowding leads to an increased risk of **measles** and **meningitis** outbreaks as well as an increased incidence of **acute respiratory infections**. There is an **immediate risk** of these diseases, with the risk of acute respiratory infections increasing further as winter approaches. **Water-related** and **vector-borne disease** transmission is also increased in overcrowded conditions (see below).

Tuberculosis: Although not a leading cause of mortality during the emergency phase, tuberculosis often emerges as a critical problem once other epidemic-prone diseases have been adequately controlled. Interventions for TB must be included in basic health care being provided to the affected population. Case-finding among TB suspects through sputum-smear microscopy and appropriate treatment of TB patients in line with the requirements of the DOTS strategy should be maintained.

Water-related diseases

There is an immediate INCREASED RISK of water-related disease outbreaks i.e. **typhoid fever, shigellosis and other diarrhoeal diseases, and hepatitis A and E**, related to unsafe drinking water and inadequate sanitation (see safe water and sanitation below). Though **cholera** has not been officially notified in Pakistan, the population is considered as being at risk due to recent outbreaks in the region (Afghanistan, June 2005). Outbreaks of these diseases could occur at any time.

Leptospirosis is present on the Indian subcontinent but unlikely to be a major concern in earthquake-affected areas. It is freshwater-related, and there may be an increased risk at lower, warmer elevations. A (slight) increase may occur due to crowding together of rodents and humans. The epidemiology of leptospirosis remains unpredictable.

Vector-borne diseases

Malaria: Transmission in the affected areas is seasonal, unstable and dependent upon altitude, temperature and rainfall. Transmission (mainly *P.vivax*, but including *P.falciparum*) occurs from April/May through November at altitudes below 2000m. Although this peak period for transmission has now largely passed, new cases may continue to appear until mid-December. Immediate access to effective treatment for falciparum malaria can be life-saving. Main malaria risks associated with the earthquake are displacement of vulnerable non-immune populations from the highlands to lower endemic areas, and lack of adequate shelter resulting in increased nighttime exposure to mosquito bites. In the upcoming season, the risk of malaria could further increase as a result of mosquito breeding if rain water is allowed to stagnate, and from the disruption of the capacity of both governments and populations to implement control activities.

The recommended treatment for falciparum malaria in crisis affected populations is artemisinin-based combination therapy (ACT). Artesunate plus sulfadoxine/pyrimethamine is the current national policy in Afghanistan. This ACT is also suitable for treatment of falciparum malaria in the affected populations in Pakistan and India, but not for vivax malaria. Treatment for vivax malaria can be with chloroquine, after laboratory confirmation of diagnosis by malaria microscopy or rapid diagnostic test (RDT). Appropriate antimalarial drugs, RDT and other materials should be distributed to peripheral health facilities in endemic parts of the affected areas, also in preparation for the next malaria transmission season (April/May 2006).

Other vector-borne diseases: Dengue, leishmaniasis, typhus and Japanese encephalitis are endemic to the Indian sub-continent. The risk is dependent on the natural range of the respective vector, which is poorly documented in most cases.

- **Dengue** transmission risk is increased among people living in overcrowded conditions or inadequate shelters, particularly at lower elevations (<2000m). Risk is further enhanced by storage of fresh water in unprotected containers, which can allow vector breeding.
- **Leishmaniasis** outbreaks have recently occurred in Pakistan (Northwest Frontier Province, 2002). The current epidemiology of leishmaniasis remains unpredictable. Efforts to control the disease in the region by provision of diagnostic facilities and appropriate measures directed against phlebotomine flies and mammalian reservoir hosts should be instituted.
- **Japanese encephalitis (JE)** is a leading cause of viral encephalitis in the Indian sub-continent. In most areas, the period of transmission starts in April/May, and lasts through September/October.
- **Typhus** is also a risk due to increased exposure to mite vectors in bushes and forests as people are displaced.

Food-borne diseases

Following such a natural disaster, 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 could lead to 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 and boiled or otherwise made safe before it is consumed. As persons suffering from the direct effects of the disaster may already be at risk through malnutrition, exposure, and other trauma, it is essential that their food safety is ensured. This is particularly important for foods for infants, pregnant women and the elderly who are most susceptible to food-borne diseases.

Recent Outbreaks

Between 1 January 2001 to 11 October 2005, WHO headquarters identified 30 outbreaks of potential international concern from a variety of sources of information. WHO requested further information on all of these events and received official information for 19; 5 of the 19 events were NOT outbreaks. A summary of the 14 verified outbreaks is presented below.

Outbreak	Final diagnosis	Number of outbreaks reported	Area of outbreak
Acute watery diarrhoeal syndrome		2	Kotdeji, Sindh (Village of Dari Kansari) Hyderabad
Acute diarrhoeal syndrome		1	Muslimabad, Landhi town
Acute viral haemorrhagic fever syndrome	Crimean-Congo haemorrhagic fever	3	Rawalpindi Chaman Loralai Ziarat
Acute fever and rash syndrome	Suspected measles	1	Islamabad
Acute haemorrhagic fever syndrome		1	Rawalpindi
Leishmaniasis	Cutaneous leishmaniasis	1	Sindh Province and North West Frontier Province
Highly pathogenic avian influenza	Highly pathogenic avian influenza	1	Karachi
Unknown	Unknown	4	Umerkot and Golarchi Malik, Moro, Swabi district, Landi Khosa area

(Data source: WHO/CDS – Alert and Response Operations, 12 October 2005).

2. IMMEDIATE INTERVENTIONS

The most immediate concern is for search and rescue. Thereafter, the focus should be on ensuring the availability of water and sanitation, medical supplies, food, and rehabilitation for the homeless.

To reduce the morbidity and mortality from communicable diseases in displaced populations, the key interventions are: the provision of safe and adequate food, water and sanitation; appropriate shelter and site planning; immunization of vulnerable populations; institution of vector control measures, and health education on hygiene and hand-washing.

2.1 Emergency medical care

Priority must be given to providing emergency medical and surgical care for the injured. Wounds must be properly cleaned and cared for to prevent **wound-related infections**. **Tetanus** cases can be expected to occur due to the low vaccination coverage for tetanus toxoid. Trauma care should include vaccination against tetanus.

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 priority communicable diseases. Infection control guidelines – including nosocomial infections – should also be made available to health care workers.

Additionally, psychosocial support should be provided to the affected communities.

2.2 Provision of shelter and site planning

Temporary shelter provided must be protective against prevailing climatic conditions. 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.

2.3 Water and Sanitation

- Except for malnutrition, all the most common causes of death in emergencies and natural disasters are communicable diseases directly related to environmental health conditions.
- Conditions leading to communicable disease epidemics are caused mostly by secondary effects and not by the primary hazard. The control of communicable diseases in humanitarian emergencies therefore strongly depends on creating healthy living environments.
- Ensuring **uninterrupted provision of safe drinking water** is the most important preventive measure to be implemented in order to reduce the risk of outbreaks of water-borne diseases.
- 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.
- 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 should 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.
- In addition, **adequate sanitation facilities** should be provided in the form of latrines or designated defecation areas.
- Close coordination among sectors working to provide adequate water and sanitation facilities for the affected population is vital for prevention of water-related diseases not only for an effective emergency response, but also for long-term reconstruction of healthy rural and urban environments.

2.4 Safe food preparation

While the importance of safe water is well-recognized 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 communicate the importance of safe food preparation.

- 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.
- On-site training for safe food preparation should be provided for those involved in preparing food for displaced populations.
- Health education targeted towards the general population should include simple measures related to food preparation (see health education section).

2.5 Nutrition

The combination of communicable diseases (CDs) and malnutrition is a prevalent public health problem in the region. Malnutrition compromises natural immunity, leading to increased susceptibility to infection, more frequent and prolonged episodes of illness, and increased severity of disease. In Pakistan, 51% of the children are anaemic and 37% are underweight.

In addition to other preventive public health measures, where food requirements are initially unknown a mean daily per capita intake of 2100 Kcal and 46g of protein is recommended (for a developing country profile). This should be achieved through food aid via general food distributions targeting underweight

and malnourished children. Community education is crucial in order to increase awareness and facilitate access of populations to these services.

2.6 Activate surveillance/early warning and response system

The surveillance/early warning system should:

- Focus on the communicable diseases of public health significance most likely to appear in the affected area with the objective of early detection of outbreak-prone diseases.
- Be simple with standardized case definitions and reporting forms.
- For malaria: it is important to track weekly case numbers to pick up the early stages of a malaria epidemic, and provide laboratory-based diagnosis.
- 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.
- Include outbreak preparedness and response plans for priority epidemic-prone diseases.
- 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.

2.7 Immunization

Immunization against vaccine-preventable diseases should be considered to prevent epidemics and sporadic disease and death.

- To **prevent measles outbreaks** in crowded settings such as camps of displaced persons, measles immunization, together with vitamin A supplementation, is a priority health intervention.
- Each health care facility attendance 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.
- Previous vaccination coverage in the affected population is below minimum WHO recommended targets (measles vaccination coverage <60%). Additionally, no nationwide supplementary immunization activities for measles have been conducted. In this situation, all children 6 months through 14 years of age should ideally receive measles vaccine, regardless of previous vaccination or disease history. At a minimum, children 6 months through 4 years of age should be immunized.
- 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 unvaccinated infants and children (and to those with unknown vaccination status) aged 6 to 59 months.
- 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.
- Currently vaccination for cholera is **not** recommended to **control** ongoing outbreaks. Vaccination to **prevent** cholera outbreaks should be undertaken only in consultation with WHO, and along with prevention and control measures currently recommended, including safe water, sanitation and education.
- Typhoid vaccines are considered a promising strategy for prevention and control of typhoid fever in addition to priority control measures such as provision of safe water and proper sanitation.
- Mass vaccination against hepatitis A is not recommended to **prevent** outbreaks in disaster areas.
- Though several studies for the development of an effective vaccine against hepatitis E are in progress, no commercially available vaccines exist for the prevention of hepatitis E. Good personal hygiene, elementary food hygiene precautions, high quality standards for public water supplies and proper disposal of sanitary waste remain the priority recommendations to preventing transmission and outbreaks.

2. 8 Case management and medical supplies

Effective and timely case management of CDs is essential for the prevention of excess morbidity and mortality. Standardized case management protocols in accordance with national guidelines must be used to ensure appropriate treatment of CDs at every contact between patients and health care services. Additionally, essential medical supplies (including recommended antibiotics) should be available and sufficient quantities pre-positioned for use in implementation of CD control measures.

2.9 Vector control

- Attempts should be made to eliminate pooled water which may be gathering among the debris.
- In areas of *known* malaria risk: indoor spraying of shelters with residual insecticide (this should be timed in advance of the upcoming transmission season, aim at 85% coverage of all structures, and include rigorous quality control of spray operations) and/or re-treatment/distribution of insecticide-treated mosquito nets for personal protection in areas where their use is well-known, targeting in first instance pregnant women and young children who are most at risk of developing severe disease.
- Water storage containers should be covered to prevent them from becoming mosquito-breeding sites.
- 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.

2.10 Health Education - Key messages should emphasize the following:

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.
- "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.

2.11 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.

2.12 Health of Humanitarian Workers

- Travellers to earthquake-affected areas should be vaccinated for hepatitis A, hepatitis B, and typhoid fever, and should have received booster doses of polio, measles, diphtheria, pertussis and tetanus. In addition, malaria prevention through prevention of mosquito bites between dusk and dawn, complemented with use of malaria chemoprophylaxis where indicated is recommended against *P. falciparum* infection; chemoprophylaxis choices are mefloquine or doxycycline or atovaquone/proguanil.
- Yellow fever vaccination is mandatory.
- Humanitarian workers should observe the practice guidelines related to general hygiene, food safety, and water safety noted in Section 2.10.

RELEVANT PUBLICATIONS

Communicable Diseases in Emergencies – A field manual: <http://www.who.int/infectious-disease-news/IDdocs/whocds200527/whocds200527full.pdf>

Cholera and diarrhoeal diseases

WHO Health Topics: Cholera

<http://www.who.int/topics/cholera/en/>

Cholera outbreak: assessing the outbreak response and improving preparedness:

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/

Acute diarrhoeal diseases in complex emergencies: critical steps:

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

Dengue

http://w3.who.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/>

Flooding and Communicable Diseases fact sheet: http://www.who.int/hac/techguidance/ems/flood_cds/en/

Food safety in emergencies: http://www.wpro.who.int/tsunami/docs/Food_safety_emergencies.pdf

Health of Humanitarian Workers

www.who.int/ith

Hepatitis A

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

Hepatitis B

<http://www.who.int/mediacentre/factsheets/fs204/en/index.html>

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/

Malaria

<http://www.who.int/malaria>

<http://www.who.int/malaria/epidemicsandemergencies.html>

<http://www.who.int/malaria/malariaandtravellers.html>

<http://www.emro.who.int/rbm/>

Measles

WHO Immunization, Vaccines and Biologicals: Emergencies – Measles

<http://www.who.int/vaccines/en/emergencies3measles.shtm>

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/

WHO-UNICEF joint statement on reducing measles mortality in emergencies

http://whqlibdoc.who.int/hq/2004/WHO_V&B_04.03.pdf

Meningitis

Control of epidemic meningococcal disease. WHO practical guidelines:

<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/

Water and sanitation

http://www.who.int/water_sanitation_health/en/

http://www.who.int/water_sanitation_health/hygiene/emergencies/em2002intro.pdf