

# Indonesia earthquake-affected areas

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Communicable disease risks and interventions, May 2006



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## PREFACE

The purpose of this *Indonesia 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 emergency-affected population. The endemic and epidemic-prone diseases indicated have been selected on the basis of the burden of morbidity and mortality in the area, as 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 areas currently affected by the earthquake.

# 1. BACKGROUND AND DESCRIPTION

On Saturday 27 May 2006 at 05:55, an earthquake measuring 6.2 on the Richter scale hit Yogyakarta and Central Java. The epicenter was 15 - 20 km southwest of Yogyakarta (17.1 km/10.6 miles depth) and affected two provinces, Central Java and Yogyakarta. The densely populated localities (approximately 1 500 people/km<sup>2</sup>) affected by the earthquake are Bantul, Solo, Yogyakarta, Pati, and some parts of Semarang. Despite its close proximity to the quake's epicentre, ongoing volcanic activity of Mt. Merapi some 38 km south of Yogyakarta is not related to the earthquake.

The earthquake has caused considerable infrastructural damage. Aftershocks have been felt in nearby cities as well on the north coast of the island. No tsunami was reported from the quake. As of 31 May 2006, at least 5 414 people were reported to have been killed in the quake. The worst devastation is in Bantul, located 7 km away from the epicenter, where 80% of the homes were flattened.



Source of Map: OCHA

## Risk factors for increased communicable disease burden

1. **Population displacement with overcrowding:** Overcrowding is a risk factor for transmission of **measles**, **meningitis** and increased incidence of **acute respiratory infections**. There is an immediate risk of these diseases. Waterborne and vector-borne disease transmission is also increased in overcrowded conditions.
2. **Interruption of safe water and sanitation supplies:** can lead to an increased risk of waterborne disease outbreaks i.e. **typhoid fever**, **shigellosis**, **hepatitis A and E** related to unsafe drinking water and inadequate sanitation. **Leptospirosis** is freshwater borne, and is associated with crowding of rodents and humans. As the epidemiology of leptospirosis remains unpredictable, alertness for leptospirosis-induced hepatitis is important.
3. **Difficult access to health services:** where health infrastructure has been destroyed or overwhelmed, the provision of emergency medical treatment for communicable diseases and surgical care for appropriate wound care may be limited, contributing an increased disease burden.

### Vector-borne diseases

The most heavily affected areas of Bantul and Klaten are not **malaria**- endemic areas. Some neighbouring districts in the Menoreh Hills have malaria potential but are currently at a very low level of incidence due to effective malaria control activities for the past five years. The Provincial Health Office of DKI Yogyakarta is still functioning, while the neighbouring Provincial Health Office of Central Java is unaffected and fully functioning and already responding with assistance to the affected districts of both Central Java and Yogyakarta. A rapid needs assessment by the national malaria control programme is ongoing.

Central Java faced large scale epidemics of **plague** during the first half of the 20th century. No human cases were reported between 1970 and 1997, the year of the last occurrence (6 cases/0 deaths). However, a persistent natural focus is described in this area at high altitude close to the volcanoes Merapi and Merbabu. Population displacements following the volcano eruptions and intense earthquake could facilitate contacts between wild rodents (the natural reservoir) and domestic rodents, with subsequent transmission to humans. If cases occur, management would be challenging if secondary pneumatic forms occur among bubonic cases. Additionally, where heavy stigmatization of plague patients persists, social panic can occur and result in flight of the population.

**Dengue** is endemic in the country. Risk of transmission is increased among people living in inadequate shelters and/or overcrowded conditions, particularly where fresh water is stored in unprotected water containers and rainfall collects in other artificial containers. **Scrub typhus** is also a risk as a result of increased exposure to mite vectors in bushes and forests where people may be displaced. Though **rabies** is endemic in other parts of the country, central Java has been rabies-free since 1997.

### Routine immunization vaccination coverage

Comparatively high levels of routine vaccination coverage have been attained in the country. However, coverage levels for some antigens, including **tetanus** and **poliomyelitis**, are below those recommended by WHO. A nationwide mass **measles** supplementary immunization campaign has been partially implemented in the country. Indonesia had not had a wild poliovirus case since 1995. However as of 10 April 2006, 1 new wild poliovirus case has been reported from Aceh Tenggara District, Aceh province. (caused by an importation of type 1 wild poliovirus). The total number of polio cases in 2005 amounted to 349 (including 46 type 1 VDPV from Madura Island in East Java Province). To date, 2 cases have been reported in 2006.

Summary of Immunization coverage attained in Indonesia 2001 – 2004\*

Antigen (% coverage)	2004	2003	2002	2001
BCG	78	97	77	80
Diphtheria, Pertussis, Tetanus PT3	76	90	75	76
Hepatitis B 3	75	75	67	56
<i>Haemophilus influenzae</i> type b 3	75	-	-	-
Measles	78	90	44	76
Polio 3	79	90	75	77
Tetanus (women of child bearing age)	54	84	70	64

Source: WHO/Department of Immunization, Vaccines and Biologicals - Official country estimates\*

### Food-borne diseases

Following natural disasters, food in the affected areas may become contaminated and consequently contribute to outbreaks of diarrhoea and dysentery, including hepatitis (A & E) and typhoid. Poor sanitation, including lack of safe water and toilet facilities and lack of suitable conditions to prepare food have led to outbreaks of food-borne diseases. Water should be treated as contaminated and boiled or otherwise made safe before it is consumed or used as an ingredient in food. As some people suffering from the direct effects of the disaster may already be at risk, it is 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 diseases.

### Other communicable diseases of concern

- i. The presence of **highly pathogenic avian influenza A (H5N1)** in poultry of the country is of concern as it creates opportunities for human infection and illness. From 2005 to date, a total of 48 human cases of H5N1 infection including 36 deaths have been reported from Indonesia. Almost two-thirds of cases were reported in 2006. The cases are widely dispersed geographically (see Figure 1). H5N1 Human infection is still rare and remains primarily acquired through contact with infected birds and poultry.
- ii. When an emergency develops people are subjected to situations that are known to substantially increase their **risk of contracting HIV**. Massive displacement of people from their homes; women and children left to fend for themselves; social services overwhelmed or destroyed; and a lack of information and means to prevent HIV infection, such as clean needles, safe blood transfusions, and availability of condoms occurs. Disasters can create chaotic conditions that accelerate the spread of HIV. In Yogyakarta and Central Java, the estimated number of people living with HIV is 11,915 (official government estimate of 2002) and the number of people with high risk behaviour (injecting drug users; male and female sex workers and clients of sex workers) is estimated at over 1 million. Efforts should be made to ensure that **HIV/AIDS** patients receiving anti-retroviral therapy (currently 103 people) do not have their treatment interrupted.
- iii. **Tuberculosis (TB)** transmission may also increase, particularly if treatment is interrupted for more than two weeks. Interventions for TB, however, can be addressed once emergency and basic health care is re-established.
- iv. **Cholera** has not been previously reported in the areas currently affected by the earthquake.

Figure 1

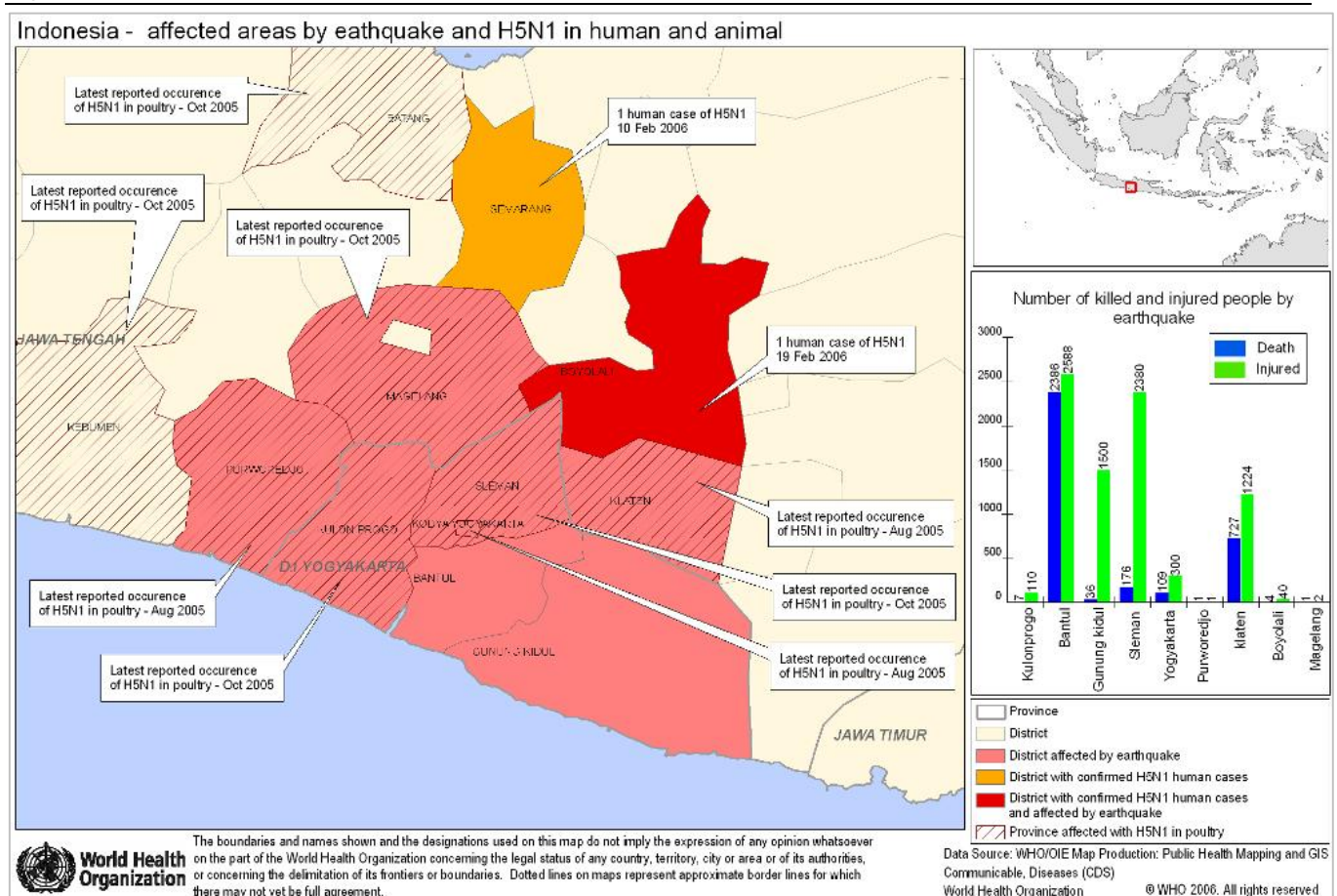


Table I: **Summary of communicable disease outbreaks recently reported in Indonesia 2001 - 2006**

Year	Disease	Region	Pathogen
2006	Human infections with avian influenza	Bekasi, East Jakarta Surabaya, East Java East Java and West Jakarta Provinces Kubu Sembelang, Karo, North Sumatra	Influenza H5 N1
2005	Measles	Tahalupu subdistrict in West Seram of Maluku; Medan; Sumba	
2005	Dengue	Several areas	
2005	Poliomyelitis	Provinces of West Java, East Java, Central Java, Banten, Jakarta, Lampung, North Sumatra and South Sumatra, Aceh (NAD), Riau	Importation of type 1 wild poliovirus
	Human avian Influenza	East Indonesia, Sulawesi	
	Human avian influenza	Provinces of Banten, Jakarta, West Java, East Java, Lampung, West Sumatra, North Sumatra	Influenza - A/H5 virus
2004	Dengue	12 provinces (Aceh, Jambi, Banten, West Java, Central Java, Yogyakarta, East Java, South Kalimantan, Bali, West Nusa Tenggara, East Nusa Tenggara)	
2003	Malaria	Mandai sub-district (Riau district, Riau Province)	
2001	Dengue	Several areas	

(Data source: WHO/CDS/ARO – Outbreak: Alert and Response Operations, May 2006)

Table II: **Summary of current communicable disease risk in earthquake-affected area**

Communicable disease	Risk
Acute lower respiratory tract infections	++
Cholera	+
Typhoid	++
Shigellosis	++
Influenza (seasonal)	++
Hepatitis A & E	++
Dengue fever	+++
Malaria	very low
Scrub typhus	+
Leptospirosis	+
Measles	++
Meningitis	++
Plague	++
Rabies	++
Tuberculosis	low

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



## 2. IMMEDIATE INTERVENTIONS FOR COMMUNICABLE DISEASE CONTROL

### 2.1 Essential trauma and medical care

Priority must be given to providing emergency medical and surgical care to people with injury-related conditions and to the provision of psychosocial support to communities.

**Injury-related conditions** account for many of the health care needs among those requiring medical attention in the immediate aftermath of the event. Falling structures have inflicted crush injuries, fractures, and a variety of open and closed wounds. Appropriate medical and surgical treatment of these injuries is vital to improving survival, minimizing future functional impairment and disability and ensuring as full a return as possible to community life. In order to prevent avoidable death and disability, field health personnel dealing with injured survivors should observe the following basic principles of trauma care:

- Patients should be **categorized by severity** of their injuries and treatment prioritized in terms of available resources and chances for survival. The underlying principle of triage is allocation of resources in a manner ensuring the greatest health benefit for the greatest number.
- **Open wounds must be considered as contaminated** and should not be closed. Debridement of dead tissue is essential which, depending on the size of the wound, may necessitate a surgical procedure undertaken in appropriate (e.g. sterile) conditions. Any associated involvement of organs, neurovascular structures, or open bone fractures will also necessitate appropriate surgical care.
- After debridement and removal of dead tissue and debris, wounds should be dressed with sterile dressings and the patient scheduled for **delayed primary closure**.
- Patients with open wounds should receive **tetanus prophylaxis**. Antibiotic prophylaxis or treatment will likely be indicated.
- Wherever possible, search and rescue workers should be equipped with **basic protective gear** such as footwear and leather gloves to avoid puncture wounds.
- **HIV post-exposure prophylaxis** (PEP) kits should be available to health care workers, rescue and safety workers in case of accidental exposure to contaminated blood and body fluids.

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, main epidemic-prone diseases (including dysentery, typhoid, hepatitis, dengue, leptospirosis, measles, meningitis, plague) and sexually transmitted infections. Infection control guidelines in accordance with national protocols should also be in place.

### 2.2 Water and sanitation

- Ensuring uninterrupted provision of safe drinking-water is the most important preventive measure 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/litre, which can be determined by using a special test kit.
- UNHCR, WHO and SPHERE 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 that 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 and, in accordance with international guidelines aimed at preventing diseases related to overcrowding, such as measles, respiratory infections, diarrhoeal diseases, tuberculosis and vector borne diseases.

### ***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 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.
- Boiling 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 displaced camp managers and NGO personnel.
- Health education targeting the general population should include simple measures related to food preparation (see health education section).

In a few instances, cases of human infection with **avian influenza** have been linked to consumption of dishes made of **raw contaminated poultry blood**. However, no epidemiological data to date suggest that the disease can be transmitted to humans through properly cooked food (even if contaminated with the virus prior to cooking).

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

The purpose of the surveillance/early warning system is to detect outbreaks and monitor endemic diseases. Rapid detection of cases of epidemic-prone diseases is essential to ensure rapid control.

The surveillance/early warning system should:

- focus on the communicable diseases of public health significance most likely to appear in the earthquake-affected area (see Table II above).
- be simple, used uniformly and include **standard case definitions** and reporting forms.
- complement **existing surveillance structures** and ensure prompt investigation of reports of epidemic-prone diseases.
- identify **laboratories** for prompt diagnosis and confirmation of the main communicable disease threats.
- data should be forwarded to the local ministry of health authorities and WHO office.

### ***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.

- In crowded settings such as camps of displaced persons, **measles vaccination**, together with **vitamin A supplementation**, is an immediate priority health intervention. In these settings, all children aged 6 months through 14 years should receive measles vaccine, regardless of previous vaccination or disease history. At a minimum, children aged 6 months through 4 years of age should be immunized. The choice of ages targeted will be influenced by previous 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.

- When the situation stabilizes, vaccinations routinely offered by the national immunization programme should be made available to all infants, pregnant women and other persons as part of the provision of basic emergency health care services.
- **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 has 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** programmes to prevent disease are not indicated. However, tetanus boosters may be indicated for previously vaccinated people who sustain open wounds, for other injured people depending on their tetanus immunization history and for search and rescue workers involved in moving mass debris.
- 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**

- Water storage containers should be covered to prevent them from becoming mosquito-breeding sites
- Attempts should be made to eliminate pooled water that may be gathering among the debris.
- In areas with open fresh-water containers, larviciding is recommended to prevent breeding of dengue vectors.
- Refuse must be collected and appropriately disposed of to discourage rodent vector breeding.
- Being a low malaria risk area, spraying of shelters with residual insecticide and/or retreatment/distribution of insecticide-treated mosquito nets is not an immediate priority at this time.

### **2.8 Health education: basic messages**

#### Promote good hygienic practice

- Wash hands with soap, ash 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 and under the nails.
- Minimum of 250 g of soap should be available per person per month.
- Use the latrine to defecate.
- Keep latrines clean.
- Promote recommended respiratory etiquette.

#### 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 people with symptoms of disease away from food preparation areas.
- Separate raw and cooked food and never use same equipment for raw foods and foods that are ready-to-eat, unless such equipment has been sanitized.
- 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 for 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 Management of dead bodies**

When death is directly due to the natural disaster, human remains do not pose a risk for outbreaks; the source of infections is more likely to be the survivors than those killed by the natural disaster. Public and emergency workers alike should be aware of this in order 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 as 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 made available for each social group to exercise their own traditions with dignity.
- Where existing facilities such as graveyards or crematoria are inadequate, additional 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 dead bodies**

- Graveyards should be at least 30 m 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 0.7 m 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.
- Ensure use of body bags, where available.
- 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 in the case of death was due to cholera or shigellosis).
- Wherever possible, vaccinate workers against hepatitis B.

## RELEVANT PUBLICATIONS

### WHO headquarters and South-East Asia Regional Office guidelines

#### Disease control in humanitarian emergencies

[http://www.who.int/diseasecontrol\\_emergencies/en/](http://www.who.int/diseasecontrol_emergencies/en/)

#### Emergency humanitarian action

<http://w3.who.org/en/Section23/Section1108.htm>

#### Health Action in Crises department

<http://www.who.int/hac/en/>

#### Situational reports

[http://w3.who.org/en/Section23/Section1108/Section2077\\_11723.htm](http://w3.who.org/en/Section23/Section1108/Section2077_11723.htm)

### Avian influenza

[http://www.who.int/csr/disease/avian\\_influenza/en/](http://www.who.int/csr/disease/avian_influenza/en/)

### Pandemic influenza preparedness and mitigation in refugee and displaced populations

[http://whqlibdoc.who.int/hq/2006/WHO\\_CDS\\_NTD\\_DCE\\_2006.2\\_eng.pdf](http://whqlibdoc.who.int/hq/2006/WHO_CDS_NTD_DCE_2006.2_eng.pdf)

### Child health in emergencies

<http://www.who.int/child-adolescent-health/publications/pubemergencies.htm>

### Diarrhoeal diseases

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/)

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/)

### Environmental health in emergencies

[http://www.who.int/water\\_sanitation\\_health/hygiene/emergencies/en/](http://www.who.int/water_sanitation_health/hygiene/emergencies/en/) ^

### Food safety

Ensuring foodsafety in the aftermath of natural disasters

[http://www.who.int/foodsafety/foodborne\\_disease/emergency/en/](http://www.who.int/foodsafety/foodborne_disease/emergency/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/>

### HIV/AIDS

HIV/AIDS interventions in emergency settings: Interagency Standing Committee guidelines.

[www.who.int/3by5/publications/documents/iasc/en/](http://www.who.int/3by5/publications/documents/iasc/en/)

### Leptospirosis

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

### Dengue

WHO/SEARO fact sheet

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

Guidelines for treatment of Dengue fever and Dengue haemorrhagic fever in small hospitals

[http://w3.who.org/LinkFiles/Dengue\\_Guideline-dengue.pdf](http://w3.who.org/LinkFiles/Dengue_Guideline-dengue.pdf)

Dengue haemorrhagic fever: early recognition, diagnosis and hospital management: an audiovisual guide for health care workers responding to outbreaks. (WHO/CDS/EPR/2006.4).

**Malaria**

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

**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/>

**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/)

**Plague**

<http://www.who.int/csr/disease/plague/en/index.html>

**Travel advice** – including for malaria

<http://www.who.int/ith/en/>

**Vaccines and biologicals for emergencies**

<http://www.who.int/vaccines/en/emergencies3.shtml>

**Vector control**

[http://whqlibdoc.who.int/hq/2006/WHO\\_CDS\\_NTD\\_WHOPES\\_GCDPP\\_2006.1\\_eng.pdf](http://whqlibdoc.who.int/hq/2006/WHO_CDS_NTD_WHOPES_GCDPP_2006.1_eng.pdf)

**Medical waste in emergencies**

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