

Communicable disease risk assessment and interventions

Flooding disaster: Nepal

August 2007



**World Health
Organization**

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Communicable Disease Surveillance and Response, WHO Regional Office for South-East Asia
WHO country office, Nepal

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Contents

Acknowledgements	3
1. Background and risk factors	5
2. Priority communicable diseases	6
3. Immediate interventions for communicable disease control	9
4. Relevant publications	12
5. WHO-recommended case definitions	15

Acknowledgements

This technical note was edited by Dr John Watson and Dr Michelle Gayer of the World Health Organization (WHO) Programme on Disease Control in Humanitarian Emergencies (DCE), Communicable Diseases Cluster (CDS).

The communicable disease risk assessment was produced by the Communicable Diseases Working Group on Emergencies (CD-WGE) at WHO headquarters. The CD-WGE provides technical and operational support on communicable disease issues to WHO regional and country offices, ministries of health, other United Nations agencies, and nongovernmental and international organizations. The Working Group includes the departments of Control of Neglected Tropical Diseases (NTD), Epidemic and Pandemic Alert and Response (EPR), the Special Programme for Research and Training in Tropical Diseases (TDR) in the Communicable Diseases (CDS) cluster; the Global Malaria Programme (GMP), Stop TB (STB) and HIV/AIDS in the HIV/AIDS, Tuberculosis and Malaria (HTM) cluster; the departments of Child and Adolescent Health and Development (CAH), Immunizations, Vaccines and Biologicals (IVB) in the Family and Community Health (FCH) cluster; Food Safety, Zoonoses and Foodborne Diseases (FOS), Public Health and Environment (PHE) in the Sustainable Development and Healthy Environments (SDE) cluster; Injuries and Violence Prevention (VIP) and Nutrition for Health and Development (NHD) in the Noncommunicable Diseases and Mental Health (NMH) cluster; Security and Staff Services (SES) in the General Management (GMG) cluster; and the departments of Health Action in Crises (HAC) and Polio Eradication Initiative (POL).

The following people were involved in the development and review of this document and their contribution is gratefully acknowledged:

Claire-Lise Chaignat, (CDS/NTD); Yves Chartier, (SDE/PHE); Micheline Diepart (HTM/HIV); Olivier Fontaine, (FCH/CAH); Saskia Hendrickx, (SDE/FOS); Alexandra Hill (CDS/NTD); Dominique Legros (CDS/EPR); Steve Martin, (EPR/GIP); Angela Merianos (EPR/ARO); Zinga Jose Nkuni, (HTM/GMP); Salah Ottmani (HTM/STB); Cathy Roth, (EPR/BPD); Peter Strebel (FCH/IVB); Wenqing Zhang (CDS/GIP).

Contributions to previous risk assessments from the following focal points have also been incorporated:

Jorge Alvar (CDS/NTD); Pascale Gilbert-Miguet (GMG/SES); José Hueb (SDE/PHE); François-Xavier Meslin (SDE/FOS); William Perea (CDS/ERI); Aafje Rietveld (HTM/GMP); Jos Vandelaer (FCH/IVB); David Meddings (NMH/VIP); Mike Nathan (CDS/NTD); Benjamin Nkowane, (DGR/POL).

Preface

The purpose of this technical note is to provide health professionals in United Nations agencies, nongovernmental organizations, donor agencies and local authorities working with populations affected by emergencies with up-to-date technical guidance on the major communicable disease threats faced by the flood-affected population in Nepal.

The endemic and epidemic-prone diseases indicated have been selected on the basis of the burden of morbidity, mortality and epidemic potential in the area, as previously documented by WHO.

The prevention and control of communicable diseases represent a significant challenge to those providing health-care services in this evolving situation. It is hoped that this technical note will facilitate the coordination of activities to control communicable diseases between all agencies working among the populations currently affected by the crisis.

1. BACKGROUND AND RISK FACTORS

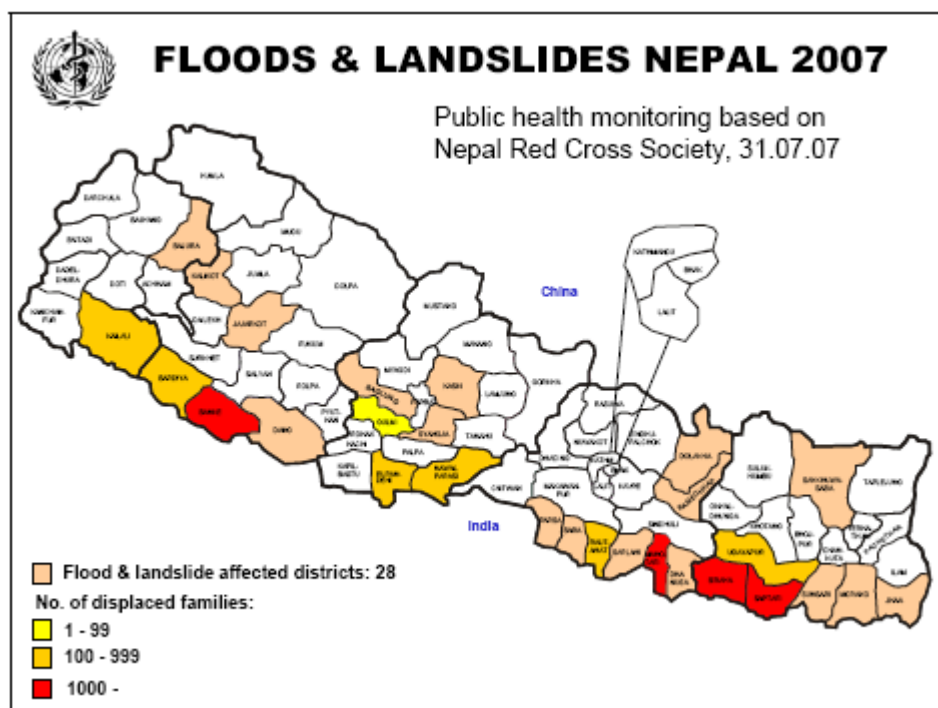
Nepal experiences seasonal monsoons that typically occur between June and September. The onset of monsoonal rains on 10 July 2007 in the Terai (low-lying) districts of Nepal caused severe flooding with associated landslides and the large-scale displacement of affected populations.

The Nepalese Ministry of Home Affairs and the Nepal Red Cross Society estimate that, as of 6 August, flooding and landslides have killed at least 94 people, displaced more than 21 570 families and affected approximately 333 500 individuals in 33 districts of Nepal.

Preceding droughts, declining crop production and the lingering effects of a 10-year insurgency have contributed to chronic food insecurity and a relatively high prevalence of malnutrition. Based on recent United Nations estimates, the proportion of the population who are undernourished, as measured by insufficient caloric intake, is very high (>40%).

Despite receding water levels in some affected areas, several areas remain cut off by high waters, preventing the delivery of humanitarian aid and detailed assessments. The emergency response is therefore more complex than that of monsoon-related disasters in recent years. The Eastern and Central Terai districts are the most challenging areas, given the combination of security-related concerns and limited governmental structures in some areas.

Needs assessments have identified food, potable water and temporary shelter as the major deficiencies. Health issues are of major concern in at least five districts, with reports of fever, acute respiratory infections (ARI), diarrhoea, vector-borne diseases and snake bites. Access to the public health system has also been affected, and the capacity of the surveillance system to detect and respond to epidemics has been weakened by the continuing socioeconomic crises.



Risk factors for increased communicable disease burden

1. **Interruption of safe water and sanitation supplies.** The populations displaced by flooding are at immediate and high risk of outbreaks of **waterborne** and **foodborne diseases**.
2. **Population displacement with overcrowding.** Populations in the affected areas are at immediate and high risk for transmission of **measles** and **meningitis** and at increased incidence of **ARI**.
3. **Vector breeding.** Flooding can result in the proliferation of vector breeding sites, increasing the medium-term (weeks to months) risk of **malaria** as well as **dengue** and other endemic arboviruses such as **Japanese encephalitis**.
4. **Poor access to health services,** as health infrastructure has been destroyed or overwhelmed, is of immediate concern.
5. **Malnutrition and transmission of communicable diseases.** Malnutrition compromises natural immunity, leading to more frequent, severe and prolonged episodes of infections. Severe malnutrition often masks symptoms and signs of communicable diseases, making prompt clinical diagnosis and early treatment more difficult.

2. PRIORITY COMMUNICABLE DISEASES

Waterborne and foodborne diseases

The populations affected by the flooding in Nepal are at **immediate risk** from outbreaks of waterborne and foodborne diseases, particularly **cholera, typhoid, *Shigella dysenteriae* type 1, and hepatitis A and E**. Population displacement, crowding, poor access to safe water, inadequate hygiene and toilet facilities, and unsafe food preparation and handling practices are associated with transmission. Usual water sources can become unsafe for drinking for several reasons: the incursion of flood waters; faecal contamination caused by overflow of latrines and inadequate sanitation; contamination by dead animals; and upstream contamination if water sources are interconnected.

Cholera is endemic in Nepal and transmission was documented before the current flooding. Between 1 July and 2 August 2007, 257 cases of laboratory-confirmed ***Vibrio cholerae*** were reported to WHO. Since the onset of the rains, cases of diarrhoea and dysentery, including deaths, have been reported from the flood-affected areas, and the immediate risk of further cases will remain extremely high.

Leptospirosis is freshwater-borne and is associated with flooding and the crowding of rodents and humans on shared dry ground.

Vector-borne diseases

Plasmodium falciparum and *P. vivax* **malaria** are endemic in the low-lying (<1200 metres), flood-affected areas of Nepal. These areas experience seasonal epidemics, and populations will be at increased risk given the proliferation of vector breeding sites secondary to flooding. Rapid needs assessments are ongoing. Specific malaria case management information can be found in Section 3.

Nepal reported its first outbreak of **dengue fever** in 2006, with cases occurring predominantly in the Terai region. The risk of transmission may be 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, allowing mosquito vectors to proliferate.

Japanese encephalitis is also endemic in Nepal, with 80–90% of cases typically occurring during the rainy season (June to October), and with incidence of cases peaking in August and September. Outbreaks have occurred regularly. During the 2005 outbreak of the disease, 1879 suspect cases were reported, of whom 298 died (case-fatality rate: 16%). Of these, 1636 cases and 262 deaths occurred in the western,

Communicable Disease Working Group on Emergencies (CDWGE-WHO/HQ);

Communicable Disease Surveillance and Response (CSR/SEARO);

WHO Office - Nepal.

CD risk assessment and interventions: Flooding disaster Nepal, 7 Aug 07.

mid-western and far-western regions of Nepal. Vector control methods and personal protection information can be found in Section 3.

Diseases associated with crowding

Population displacement caused by flooding can result in crowding in resettlement areas, raising the risk of transmission of certain communicable diseases. **Measles** (see vaccine-preventable diseases), **ARI and meningococcal disease** are transmitted from person to person, and risk is increased in situations of forced relocation to shared areas of high ground, often with inadequate shelter. Crowding can also increase the likelihood of transmission of waterborne and vector-borne diseases. To date, **avian influenza** has not been reported from Nepal.

Vaccine-preventable diseases and routine immunization coverage

Measles outbreaks have been reported less frequently from Nepal as levels of vaccine coverage have improved. However, national measles vaccination coverage is suboptimal to prevent transmission among the population of the affected areas. In 2004–2005, Nepal conducted a nationwide catch-up measles campaign for all children aged 6 months to 14 years that achieved >90% coverage. Whereas overall population immunity to measles remains high, the coverage among cohorts born since the campaign is suboptimal and will result in a gradual build-up of susceptible preschool-age children.

Since 1 January 2007, three laboratory-confirmed outbreaks of measles have been reported in Nepal, all in the first quarter of the year. The number of cases in these outbreaks was 11, 19 and 6, respectively.

Polio is not currently endemic in Nepal, although cases due to imported poliovirus were identified in 2005 and 2006.

Coverage levels for other antigens, including **tetanus** and **diphtheria**, are below those recommended by WHO (see Table 1).

Table 1. **Routine vaccination coverage, 2005, Nepal**

Antigen	% coverage*
(BCG) bacille Calmette–Guérin	87
Diphtheria–pertussis–tetanus, 3rd dose	75
Hepatitis B, 3rd dose	41
MCV (measles-containing vaccine)	74
Polio, 3rd dose	78

* Official country estimates reported to WHO/UNICEF, as of 7 August 2007

Other risks

- i. When an emergency develops, people may be subjected to situations that substantially increase their **risk of contracting the human immunodeficiency virus (HIV)**. Risk factors include massive displacement of people from their homes; women and children left to fend for themselves; social services overwhelmed or destroyed; and a lack of means to prevent HIV infection, such as clean needles, safe blood transfusions and availability of condoms. Nepal has a concentrated **HIV** epidemic, mainly affecting commercial sex workers, their clients and injecting drugs users. Population mobility within and across borders is also a factor recognized to increase the risk of exposure to HIV transmission. This

risk may increase as much of the flood-affected area is itself a border zone. The overall prevalence rate in the population is estimated to be 0.5%, with 75 000 people (of whom 16 000 are women) living with the virus. As of January 2007, 580 were receiving antiretroviral therapy (ART). The emergency response should ensure a minimum package of HIV prevention, treatment and care services, including the strengthening of standard precautions, with the provision of gloves, sterile needles and syringes and safe waste disposal management in health services. Additional services should include provision of condoms, education and prevention messages, and post-exposure prophylaxis for occupational exposure and for survivors of rape. Needle and syringes exchange programmes should be maintained. Efforts should be made to ensure that HIV/AIDS patients receiving ART do not have their treatment interrupted and to provide ART for prevention of HIV transmission from known infected mothers.

- ii. Transmission of **tuberculosis (TB)** may also increase. The main problem is the interruption of anti-TB treatment provision to patients already undergoing treatment; it is therefore important to ensure uninterrupted access to treatment for these patients during the acute phase of an emergency. Other aspects of TB control can be addressed once emergency and basic health care have been re-established.
- iii. **Injuries** sustained through navigating floodwaters, displacement of hazards, or by virtue of near drowning are likely to be a risk factor for increased transmission of communicable diseases. Their management may be complicated by greater delays in presenting for care and limited access of skilled personnel to the affected areas. Inadequate **tetanus** vaccination coverage (75%) also increases the likelihood of morbidity and mortality from tetanus.

Table 2. **Summary of risk of communicable diseases in flood-affected populations**

Communicable disease	Of immediate concern following floods	Of concern in weeks to months following floods
Cholera/Typhoid/Shigellosis	+++	
Acute lower respiratory tract infections	+++	
Hepatitis A & E	++	
Leptospirosis	++	
Measles	++	
Malaria	+	+++
Japanese encephalitis	+	+++
Tuberculosis	+	++
Dengue fever	+	++
Meningitis	+	
Poliomyelitis	+	
HIV/AIDS		++

Key: + = low risk ++ = moderate risk +++ = high risk

3. IMMEDIATE INTERVENTIONS FOR COMMUNICABLE DISEASE CONTROL

Water and sanitation

- Ensuring uninterrupted provision of safe drinking-water is the most important preventive measure in reducing the risk of outbreaks of waterborne diseases.
- UNHCR, WHO and SPHERE recommend that each person be supplied with **at least 20 litres** of clean water per day.
- 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 and 0.5 mg/litre, which can be determined by using a special field test kit.
- 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.
- Key messages on hygiene should be promoted to sensitize communities to the relevant health risks.
- In addition, **adequate sanitation facilities** should be provided in the form of latrines or designated defecation areas.

Management of Malnutrition

- Bacterial infections are very common in severely malnourished children on initial admission to hospital. Clinical management of malnourished patients, including fluid management, must be thorough, carefully monitored and supervised. Common problems encountered in severe malnutrition include hypothermia, hypoglycaemia, dehydration and electrolyte disturbances. It is important that the phases and principles of management of severely malnourished children are followed as outlined in WHO guidelines (see Section 4).
- Regular assessments of the nutritional status of vulnerable populations and of food security are necessary to calculate the caloric, protein and micronutrient needs of potential food aid, monitor household access to food (including costs in the market), food intake/feeding habits and agricultural practices.
- Efforts should be made to improve household access to food (e.g. seed distribution, land/crop management, income generation activities) and to institute appropriate child feeding and caring practices, including diversifying diets.

Shelter and site planning

- Wherever possible, shelters for the displaced or homeless must be positioned with sufficient space between them and, in accordance with international guidelines, aimed at preventing diseases related to overcrowding, such as measles, ARI, diarrhoeal diseases, TB and vector-borne diseases.
- In shelter sites and when distributing food, particular attention and protection should be given to women and unaccompanied minors.

Safe food preparation

- Water should be treated as contaminated and boiled or made safe through treatment with chlorine before it is consumed or used in food.

- Health education targeting the general population should include simple measures related to food preparation (see health education section).
- Safe food is particularly important for infants, pregnant women and the elderly who are most susceptible to foodborne diseases.

Case management

- Heightened community awareness of the need for **early treatment** and reinforcement of **proper case management** are important in reducing the impact of communicable diseases. The use of **standard treatment protocols** in health facilities with agreed-upon first-line drugs is crucial to ensure effective diagnosis and treatment for ARI, the main epidemic-prone diseases (including dysentery, typhoid, hepatitis, measles, malaria, and meningitis) and STIs.
- Standard **infection control practices** in accordance with national protocols should also be in place.
- The national treatment protocol for *P. falciparum* **malaria** is as follows:
 - for uncomplicated cases:
 - not laboratory-confirmed: chloroquine;
 - laboratory-confirmed: artemether–lumefantrine
 - For severe cases: quinine x 7 days.
- For *P. vivax* **malaria**: chloroquine + primaquine.
- Provision of anti-**TB** treatment must be ensured for TB patients who were on treatment in the affected areas. Their treatment must not be interrupted and should be provided in line with the directives of the national TB control programme (NTP) services. All aspects of TB case management should also follow the NTP directives. The drugs used to treat the disease, such as rifampicin or streptomycin, must not be used for the treatment of other illnesses.

Surveillance or early warning and response system

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

- focus on the **priority epidemic-prone communicable diseases** most likely to occur in the flood-affected population;
- be simple, used uniformly and include **standard case definitions** and reporting forms (see section 6 for WHO case definitions);
- include **preparedness plans** for outbreak response, including outbreak investigation kits and an adequate stockpile of supplies for interventions;
- complement **existing surveillance structures** and ensure prompt investigation of reports of epidemic-prone diseases;
- be sensitive to unusual emerging and re-emerging communicable diseases of major public concern;
- identify key **laboratories** for prompt diagnosis and confirmation of the main communicable disease threats, as well as protocols for transport and tracking of specimens;
- data should be forwarded to the local ministry of health authorities and the WHO office.

Immunization

- In crowded or camp settings, vaccination using a **measles-containing vaccine**, together with **vitamin A supplementation**, is an immediate priority health intervention. All children aged 6 months to 14 years should receive measles vaccine, regardless of previous vaccination or disease history.
- Outside of crowded/camp settings, a single suspected measles case is sufficient to prompt the immediate implementation of activities to control measles. 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.

- Given the threat of reintroduction of **poliomyelitis** into the area, every opportunity should be taken to give **OPV** (oral poliovirus vaccine) to all children aged <5 years, in conjunction with measles vaccination and vitamin A supplementation.
- When the situation stabilizes, vaccinations routinely offered by the national immunization programme should be made available to all infants, pregnant women and other people as part of the provision of basic emergency health-care services.
- Although vaccine can be used to control outbreaks in certain circumstances, **hepatitis A** vaccine is not recommended to prevent outbreaks in the affected population. Vaccination efforts should always be supplemented by health education and improved sanitation.
- Mass **tetanus vaccination** programmes to prevent disease are not indicated. Wounds or lacerations may occur from objects submerged in flood waters. Tetanus boosters may be indicated for previously vaccinated people who sustain wounds or other lacerations (e.g. clean-up workers) depending on their tetanus immunization history.
- **Typhoid vaccination**, in conjunction with other preventive measures, may be useful to control typhoid outbreaks depending on local circumstances.
- **Oral cholera vaccines (OCV)**. The decision to use OCV in emergency-affected populations should be guided using a recently published WHO risk assessment tool. However, current recommendations state that OCV should not be used once an outbreak has started or if basic public health priorities are not covered.

Vector control and personal protection

- Insecticide-treated bednets, preferably long-lasting insecticide-treated bednets, should be made available, with priority given to pregnant women and children aged <5 years.
- Indoor residual spraying should be instituted at the earliest opportunity.
- Refuse must be collected and appropriately disposed of to discourage rodent vector breeding.
- Water storage containers should be enclosed or covered with mosquito-proof lids.

Health education: basic messages

Safe water

- Even if it looks clear, water can contain germs.
- Add drops of chlorine to the water, or boil, 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 and which is attached to the container.

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.

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 or the site dedicated to fetch drinking-water (stream, river or water hole).
- Open wells must be covered when not in use to avoid contamination.

- 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.

Avoid mosquito bites

- Sleep under an insecticide-treated bednet.
- Make sure your house or tent/shelter has been properly sprayed with insecticide during the transmission season.
- Wear protective clothing at times when mosquitoes and other biting insects are active.
- Stay indoors when outdoor biting mosquitoes are most active.
- Use insect repellents and mosquito coils if available.
- Remove, destroy or empty small rain-filled containers near the house or tent/shelter.

Safe food

The risk of disease transmission through food preparation can be minimized by adhering (as closely as practicable) to the following recommendations:

- 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 the 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.
- Use safe water to cook vegetables, and peel fruits that are eaten raw; discard damaged (flooded), spoiled or mouldy food.
- “COOK IT – PEEL IT – OR LEAVE IT”.
- Do not allow sick animals or animals found dead to enter the food chain.

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.

4. RELEVANT PUBLICATIONS

WHO headquarters/WHO Regional Office for South-East Asia (SEARO) guidelines

Disease control in humanitarian emergencies (DCE), WHO/HQ

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

Communicable Disease Surveillance and Response, WHO/SEARO

<http://www.searo.who.int/en/section10/section369.htm>

Health Action in Crises department (HAC), WHO/HQ

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

Child health in emergencies

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

Dengue

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.whosea.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).

Diarrhoeal diseases

Acute diarrhoeal diseases in complex emergencies: critical steps:

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

Cholera outbreak: assessing the outbreak response and improving preparedness:

http://www.who.int/cholera/publications/cholera_outbreak/

First steps for managing an outbreak of acute diarrhoea:

http://www.who.int/cholera/publications/first_steps/

Guidelines for the control of shigellosis, including epidemics due to *Shigella dysenteriae* type 1:

<http://www.who.int/topics/cholera/publications/shigellosis/>

Environmental health in emergencies

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

Food safety

Ensuring food safety in the aftermath of natural disasters

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/

Leptospirosis

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

Leishmaniasis

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

Malaria

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

Malnutrition

Guidelines for the inpatient treatment of severely malnourished children

http://www.who.int/nutrition/publications/guide_inpatient_text.pdf

Community-based management of severe malnutrition

http://www.who.int/nutrition/topics/comm_based_malnutrition/en/index.html

Management of the child with a serious infection or severe malnutrition: guidelines at first referral level in developing countries

http://www.who.int/child-adolescent-health/publications/referral_care/homepage.htm

Training Course on the Management of Severe Malnutrition

http://webitpreview.who.int/entity/nutrition/publications/en/manage_severe_malnutritiontraining_fly_eng.pdf

Guiding principles for feeding infants and young children during emergencies

http://www.who.int/nutrition/publications/guiding_principles_feedchildren_emergencies.pdf

Communicable diseases and severe food shortage situations

http://www.emro.who.int/sudan/media/pdf/CDs_severe%20food%20shortages_FINAL_25082005.pdf

Communicable Disease Working Group on Emergencies (CDWGE-WHO/HQ);

Communicable Disease Surveillance and Response (CSR/SEARO);

WHO Office - Nepal.

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Management of dead bodies

Management of dead bodies after disaster situations: a field manual for first responders

<http://www.paho.org/english/dd/ped/DeadBodiesFieldManual.pdf>

Management of dead bodies in disaster situations

<http://www.paho.org/english/DD/PED/DeadBodiesBook.pdf>

Measles

WHO/UNICEF Joint Statement on reducing measles mortality in emergencies

http://www.unicef.org/publications/index_19531.html

Medical waste in emergencies

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

<http://www.healthcarewaste.org/en/documents.html?id=15&suivant=16>

<http://www.healthcarewaste.org/en/documents.html?id=184&suivant=8>

Mental health in emergencies

http://www.who.int/mental_health/resources/emergencies/en/index.html

Inter Agency Standing Committee (IASC) guidance is on mental health in emergencies – English, draft of May 2006

http://www.humanitarianinfo.org/iasc/content/documents/subsidi/tf_mhps/IASC%20guidance%20Peer%20review%20version.pdf

Inter Agency Standing Committee (IASC) guidance is on mental health in emergencies – French draft version of May 2006

http://www.humanitarianinfo.org/iasc/content/documents/subsidi/tf_mhps/La%20sant%E9%20mentale%20et%20le%20soutien%20psychosocial%20%28%20IASC%20guidance%20Peer%20review%20version%29.pdf

Meningitis

Control of epidemic meningococcal disease. WHO practical guidelines

http://www.who.int/csr/resources/publications/meningitis/WHO_EM_C_BAC_98_3_EN/en/

Laboratory specimen collection

http://www.who.int/csr/resources/publications/surveillance/WHO_CDS_CSR_EDC_2000_4/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

Travel advice

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

Tuberculosis

<http://www.moh.gov.np/programmes/Tb.asp>

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

Zoonotic diseases

<http://www.who.int/zoonoses/resources/en/>

5. WHO-RECOMMENDED CASE DEFINITIONS

ACUTE DIARRHOEA

Acute diarrhoea (passage of 3 or more loose stools in the past 24 hours) with or without dehydration.

SUSPECTED CHOLERA

In an area where cholera is not known to be present: a person aged >5 years with severe dehydration or death from acute watery diarrhoea with or without vomiting.

In an area where there is a cholera outbreak: a person aged >5 years with acute watery diarrhoea with or without vomiting.

To confirm a case of cholera:

Isolation of *Vibrio cholera* O1 or O139 from a diarrhoeal stool sample.

BLOODY DIARRHOEA

Acute diarrhoea with visible blood in the stool.

To confirm a case of epidemic bacillary dysentery: take a stool specimen for culture and blood for serology; isolation of *Shigella dysenteriae* type 1.

ACUTE FLACCID PARALYSIS (SUSPECTED POLIOMYELITIS)

Acute flaccid paralysis in a child aged <15 years, including Guillain–Barré syndrome, or any acute paralytic illness in a person of any age in whom poliomyelitis is suspected.

ACUTE HAEMORRHAGIC FEVER SYNDROME

Acute onset of fever (duration of less than 3 weeks) and any of the following:

- haemorrhagic or purpuric rash
- vomiting with blood
- cough with blood
- blood in stools
- epistaxis
- other haemorrhagic symptoms.

ACUTE JAUNDICE SYNDROME

Illness with acute onset of jaundice **and** absence of any known precipitating factors **and/or** fever.

ACUTE LOWER RESPIRATORY TRACT INFECTIONS/ PNEUMONIA IN CHILDREN AGED <5 YEARS

Cough or difficulty breathing

and

Breathing 50 or more times per minute for infants aged 2 months to 1 year

Breathing 40 or more times per minute for children aged 1 to 5 years

and

No chest indrawing, no stridor, no general danger signs.

Note: **Severe pneumonia** = cough or difficulty breathing + **one or more of the following** (inability to drink or breast feed, severe vomiting, convulsions, lethargy or unconsciousness) or chest indrawing or stridor in a otherwise calm child

MALARIA

Person with onset of fever or history of fever within the past 48 hours (with or without other symptoms such as nausea, vomiting and diarrhoea, headache, back pain, chills, muscle pain) with positive laboratory test for malaria parasites (blood film (thick or thin smear) or rapid diagnostic test).

In children

Uncomplicated malaria

Fever AND no general danger signs such as lethargy or unconsciousness, convulsions, or inability to eat or drink. Where possible, confirm malaria with laboratory test in children aged >5 years.

Severe malaria

Fever AND general danger signs (lethargy or unconsciousness, convulsions, or inability to eat or drink).

MEASLES

Fever **and** maculopapular rash (i.e. non-vesicular) **and** cough, coryza (i.e. runny nose) or conjunctivitis (i.e. red eyes).

or

Any person in whom a clinical health worker suspects measles infection.

To confirm a case of measles:

Presence of measles-specific IgM antibodies.

MENINGITIS

Suspected case

Sudden onset of fever (>38.5 °C) with stiff neck.

In patients aged ≤12 months, a suspected case of meningitis occurs when fever is accompanied by a bulging fontanelle.

Probable case of bacterial meningitis

Suspected case of acute meningitis, as defined above, with turbid cerebrospinal fluid.

Probable case of meningococcal meningitis

Suspected case of meningitis, as defined above **and** gram stain showing gram-negative diplococcus **or** ongoing epidemic **or** petechial or purpurial rash.

Confirmed case of meningococcal meningitis

Suspected or probable case, as defined above, with **either** positive-CSF antigen detection for *Neisseria meningitidis* **or** positive CSF culture or blood with identification of *N. meningitidis*.

TETANUS

Adult tetanus

Either of the following signs 3–21 days following an injury or wound:

- trismus of the facial muscles or risus sardonicus
- painful muscular contractions.

Neonatal tetanus

Any neonate with normal ability to suck and cry during the first 2 days of life who, between day 3 and day 28, cannot suck normally, or any neonate who becomes stiff or has spasms or both

UNEXPLAINED FEVER

Fever (body temperature >38.5 °C) for >48 hours and without other known etiology.

UNEXPLAINED CLUSTER OF HEALTH EVENTS

An aggregation of cases with similar symptoms and signs of unknown cause that are closely grouped in time and/or place.