

Communicable disease risk assessment and interventions

Cyclone Nargis: Myanmar

May 2008



**World Health
Organization**

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Preface

The purpose of this technical note is to provide health professionals in United Nations agencies, non-governmental 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 cyclone-affected population in Myanmar.

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

Myanmar is the largest country in mainland South-East Asia, with a coastline of 2 400 kms which largely forms the east coast of the Bay of Bengal. Three mountain ranges, run north-to-south from the Himalayas, forming natural divisions. The three main river systems, the Ayeyarwady (Irrawaddy), Sittaung and Thanlwin, flow between these barriers. The numerous tributaries of the three rivers in the delta regions make communication and transport challenging.

The country has three distinct seasons: rainy, cold and hot. The rainy season arrives with the south-west monsoon, which begins in mid-May and lasts to mid-October.

Myanmar is divided into 14 primary administrative areas (7 divisions and 7 states) and each state or division is further subdivided into districts (65), townships (325), wards (2 781) and villages (64 910). It is a largely rural, densely forested (49%) country of 55.4 million people with an average density of 75 people / km² that ranges from 595 / km² in Yangon Division to 14 / km² in Chin State, to the west of the country. The population is made up of 135 national groups, speaking over 100 languages and dialects. The population is predominantly Buddhist (89.4%) and the remainder are Christian, Muslim, Hindu and Animist. The majority of Burma's population lives in the Ayeyarwady valley, the area of Cyclone Nargis touchdown.

The annual per capita income is USD 1 691 with a ranking on the UNDP Human Development Index 2007 (HDI) of 132/177 and on the Human Poverty Index (HPI) of 52/108. The HPI measures severe deprivation in health by the proportion of people who are not expected to survive beyond the age of 40.

Early reports indicate the cyclone has affected five divisions and states (Ayeyarwady, Yangon and Bago Divisions; Kayin and Mon States) in total, mainly in the southern part of the country, as well as offshore islands (see Figure 1). The area which has been declared a State Disaster Area has a total population of 24 million.

Cyclone Nargis (Category 3-4) developed over the Bay of Bengal and made landfall at 16.00 hrs, on 2 May 2008 in the Ayeyarwady delta region with winds up to 200 km/hr and associated tidal surges, rain and flooding. Due to the complex of deltas on the coast, tidal surges are likely to have penetrated inland.

The cyclone tracked inland reaching Yangon (former capital city, 5 million inhabitants). The effects of the cyclone are reported to be significant in the coastal areas which are densely populated and in Yangon city where there is a large population of urban poor.

As of 7 May, 2008, the figures for those killed, missing or affected are still not definitive. The state media is reporting the death toll at 22 980 deaths and 42 119 missing. The number of affected population is still unknown but could be in excess of one million. These figures may be conservative and are expected to rise as more information becomes available and the delta areas are assessed.

A storm surge is reported to have destroyed the vast majority of domestic dwellings in seven townships, also causing severe storm and flood-damage to roads, communication links and other essential service infrastructure, especially water and power supplies. Such damage will hinder and complicate assessment and response efforts and increase the risk of infectious disease.

Access to the public health system, which was already inadequate, has also been severely affected, and the capacity of the surveillance system to detect and respond to epidemics has been further weakened.

The areas devastated by the cyclone and flooding produce 65% of the country's rice, 80% of the aquaculture, 50% of poultry and 40% of pig production (FAO). Damage to these industries may have a longer term effect not only on domestic supply but also on importing countries which purchase rice from Myanmar such as Bangladesh and Sri Lanka, although exports have decreased over recent years.

The Government of Myanmar has formed an Emergency Committee and announced that the priorities of its relief operations are to provide adequate food, safe drinking-water and shelter to the affected people. Health issues are of major concern in districts affected by the cyclone.

The WHO Regional Office for South-East Asia and the WHO Country Office in Myanmar are actively involved in the response. A crisis room has been activated in the WHO Country Office in Yangon. The WHO Country Office in Myanmar is working with the Myanmar Ministry of Health, UNICEF and other partners on damage and needs assessments to assist the local health authorities.

Major health problems in Myanmar, which are most likely to be exacerbated by this crisis, relate predominantly to communicable diseases (malaria, dengue, measles) and malnutrition, especially in children. As of 2003, 40% of children under five were assessed as being stunted, indicating chronic malnutrition and 10% as being wasted (acute malnutrition) (UNICEF). Major causes of death overall, are from malaria, respiratory and diarrhoeal diseases.

Given the structural damage caused by the cyclone and flooding of water supplies there is an additional risk of waterborne diseases affecting large numbers of the urban, rural and displaced populations. In addition, extensive damage to infrastructure and distribution systems, as well as power supplies, will make it virtually impossible to prepare food safely, posing an additional risk of foodborne diseases. Chlorine powder, water purification units, plastic sheeting for shelter, cooking utensils, ready-to-eat survival food rations, essential medicines, cholera kits, antimalarial drugs, long lasting insecticide-treated bednets and supplies for the management of corpses are urgently needed.

Guidance for donors on donations of drugs and medical supplies has been developed by WHO in consultation with over 100 humanitarian organizations and experts. (see Sections 2.6, ix, and 4, *Guidelines for Drug Donations*). Adhering to these guidelines will ensure that the effect of donations are maximised for the people of Myanmar and will help to prevent stockpiling of unwanted medicines and medical supplies.

Risk factors for increased communicable disease burden

1. **Interruption of safe water, sanitation and cooking facilities** due to disruption of electricity and fuel supplies. The populations displaced by the cyclone are at immediate and high risk of outbreaks of **waterborne and foodborne diseases**.
2. **Population displacement with overcrowding**. Populations in the affected areas and relief centres are at immediate and high risk from the transmission of **measles** and at increased incidence of **acute respiratory infections (ARI)**. In general increased risk of meningitis transmission is associated with overcrowding.
3. **Increased exposure to disease vectors**. Displacement of populations can result in increased exposure to disease-carrying vectors, increasing the risk of **malaria** and **dengue**. As well as other less commonly reported illnesses such as **plague, chikungunya** and **hantavirus infection**.
4. **Malnutrition and transmission of communicable diseases**. The combination of malnutrition and communicable diseases with a natural disaster creates the potential for a significant public health problem particularly in infants and children. 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.
5. **Poor access to health services** is of immediate concern. The damage caused by the cyclone to the health infrastructure is preventing access to usual services, as well as to emergency medical and surgical services being put in place in response to this emergency.
6. As flood waters recede, **increased malaria vector breeding** resulting in increased **malaria** transmission will become an issue (usually after 2-3 weeks).

Figure 1: Administrative divisions and states of Myanmar declared a state declared disaster area post Cyclone Nargis, 6 May 2008



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.



Data Source: Myanmar Information Management Unit
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2. PRIORITY COMMUNICABLE DISEASES

2.1 General notes

Jaundice and encephalitis. It will be important to consider the differential diagnosis of patients presenting with jaundice and encephalitis due to the increased number of diseases which may present with non-specific jaundice and encephalitis symptoms (e.g. leptospirosis, dengue, Japanese encephalitis).

Long incubation periods. Relief workers should be aware that there are endemic diseases in Myanmar with potentially long incubation periods e.g. hepatitis. These may present late, once the acute phase of the crisis has passed and national and international relief workers have been repatriated.

Wounds and injuries sustained, especially those 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. Survivors of near-drowning may have complications such as aspiration pneumonia. Injuries may also result from being swept by floodwaters through collapsed structures and debris. The management of all injuries may be complicated by greater delays in presenting for care and limited access by skilled personnel to the affected areas. Inadequate **tetanus** vaccination coverage (DTP3 82% nationally reported figures for Myanmar 2006) also increases the likelihood of morbidity and mortality from tetanus. (For management of wounds see section 3.4 *Essential surgical and medical care*. For relevant publications, see section 4, *Wounds and injuries*.)

2.2 Waterborne and foodborne diseases

The populations affected by the cyclone in Myanmar are at **immediate risk** from outbreaks of waterborne and foodborne diseases, particularly **cholera, typhoid, *Shigella dysenteriae* type 1(Sd1)**. There is increasing evidence of significant antimicrobial resistance, including multi-drug resistance (resistance to more than three antimicrobials) in **Sd1** isolates from the region. (For relevant publications see section 4, *Diarrhoeal diseases, Shigella antimicrobial resistance*.)

Population displacement, crowding, poor access to safe water, inadequate hygiene and toilet facilities, and unsafe food preparation and handling practices are all associated with transmission. Following the cyclone and the flooding, the immediate risk of cases waterborne and foodborne diseases is likely to be significant.

Cholera and shigellosis are endemic in the region. Usual water sources can become unsafe for drinking for several reasons: the incursion of floodwaters, faecal contamination caused by overflow of latrines, inadequate sanitation and upstream contamination of interconnected water sources.

Hepatitis A+E background levels of hepatitis will be exacerbated by the crisis. (For relevant publications, see section 4 *Hepatitis A and Hepatitis E*.)

Leptospirosis is a bacterial zoonosis present worldwide. It appears to be increasing in all regions, especially as an urban hazard during heavy rains and floods. Infection in humans may occur indirectly when the bacteria comes into contact with the skin (especially if damaged) or the mucous membranes. It can also result from contact with moist soil or vegetation contaminated with the urine of infected animals, or with contaminated water as a result of swimming or wading in floodwaters, accidental immersion or occupational abrasion. Infection may also occur as a result of direct contact with tissues or urine of infected animals and occasionally through ingesting food contaminated with urine of infected animals and droplet aerosol inhalation of contaminated fluids.

Increased risk is associated with flooding and the crowding of rodents, wild and domestic animals and humans on shared dry ground.

2.3 Vector-borne diseases

Dengue / Dengue Haemorrhagic Fever (DHF) is a viral disease transmitted by the *Ae. aegypti* mosquito. Its prevalence is increasing in South-East Asia, including in Myanmar. In 2003, 8 out of 11 south-east Asian countries reported dengue cases, in 2006, 10 out of 11 countries reported cases. A major outbreak occurred in 1998 resulting in 13 000 cases and outbreaks, reporting a greater number of cases, occurred in 2001-2002 and in 2007. In 2006 Myanmar reported 11 383 cases (SEARO) representing 6% of cases occurring in the region.

National figures by province in 2007 indicate most cases are reported from Yangon (31%), Ayeyarwaddy (16%), Mon (15%), Magwe (7%), Mandalay (6%), Bago East (6%) and Tanintharyi (6%). The CFR varies from 0.2% to 6.25%.

Most cases of dengue in Myanmar occur from **May to October**, during the rainy season, and peak in July. In the current circumstances, health-care facilities and staff are likely to see an increase in the numbers of patients with injuries and trauma, leading to greater difficulties in the early detection of symptoms of dengue and treatment for those who progress to DHF.

It is important that health personnel are alerted to the likely increase in cases, how to recognise the early features of the disease and to the need to stockpile supportive treatment supplies. Early detection and treatment of DHF can reduce the CFR from 20% to 0.75% .

DHF can affect all age groups. 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. (See section 4 for relevant publications on Dengue and DHF.)

Malaria risk exists in Myanmar throughout the year: 29% of the population live in high risk areas, 24% in moderate risk areas and 18% in low risk areas. Apart from those living in endemic areas, a major risk group are non-immune adult migrants in forest areas who work in gem mining, logging, agriculture, plantations and construction.

The full extent of the burden of malarial disease is likely to be higher than records indicate due to a poor reporting system. The disease is endemic in 284 townships out of 324. One hundred of these townships account for 53% of the total case load in the country. On average about 70% of reported cases are 15 years old and above and only 25-40% of suspected malaria cases seek care in the public health sector.

Approximately 80% of malaria cases are due to *Plasmodium falciparum*. Focal outbreaks are common, especially in the border areas, occurring almost every year in Shan State and Rakhine State. Mandalay division experienced an outbreak in 2002 and Yangon division in 2004.

All the areas within the state declared disaster zone (Ayeyarwady, Yangon and Bago divisions, Kayin and Mon states), are areas of intense malaria transmission.

In 1999, 591 826 malaria cases were reported from public health facilities nation-wide, in 2001, 661 463 cases, in 2003, 716 100 and 2 476 deaths, in 2006, 548 110 cases with 1 647 malaria related deaths.

The risk is highest in remote rural, hilly and forested areas. *P. falciparum* resistant to chloroquine and sulfadoxine-pyrimethamine has been reported. Mefloquine resistance has been reported in Kayin state and in the eastern part of Shan state. *P. vivax* with reduced sensitivity to chloroquine has also been reported

The main vectors include *Anopheles sunaicus*, *dirus*, *annularis* (resistant to DDT) and *minimus*..

Displaced populations will be at an increased risk of malaria with the extension of vector breeding sites that have resulted from storm damage and flooding. (See section 3.4 for specific malaria case management information in Myanmar).

Summary of Malaria situation in Myanmar, 2006

- Total population = 55.40 million
- Population at risk = 38.78 million
- Malaria cases = 548 110 (probable + confirmed)
- Confirmed cases = 200 679
- Malaria deaths = 1 647
- Morbidity rate = 9.91/1 000 pop.
- Mortality rate = 2.98/100 000 pop.
- *P. falciparum* = 80%
- Drug resistance = high and widespread (CQ;SP)
- Main vectors = *An. Minimus* and *An. Dirus* (in hilly and forest areas); *An. sundaicus* (in coastal areas)
- High risk groups
 - o migrant workers in rural development projects
 - o forest-related workers; settlers in the forest / forest fringes
 - o upland subsistence farmers; ethnic communities

Plague displaced populations have an increased risk of exposure to rodents and flea vectors, and therefore, an increased risk of plague. Myanmar is considered to be endemic for plague. Human cases were regularly reported until 1994, mainly from Magway, Mandalay and Sagaing divisions.

Japanese encephalitis occurs in the South-East Asia region and can affect all age groups. It is transmitted by the *Culex* mosquito which breeds predominantly in flooded rice fields. The virus circulates in Ardeidae birds (herons, egrets). Pigs are amplifying hosts and the areas affected by the cyclone and flooding account for 40% of the country's pig production. Culicines are normally zoophilic (infect mainly animals) but infection in humans can occur and is associated with an explosive increase in the mosquito population which occurs during flooding. (Vector control methods and personal protection information can be found in section 3.7).

Filariasis is a mosquito-borne parasitic disease causing swelling of the limbs, urogenital organs, breast etc. with long-term disability. It is endemic in Myanmar in 60 out of 65 districts, including all those areas affected by the cyclone. Control programmes, with national elimination goals, are in operation.

Yellow fever. Myanmar is not an endemic country. However, a yellow fever vaccination certificate is required for all travellers arriving from countries with a risk of yellow fever transmission. The vector is present in the country, though entomological data is not available regarding density and distribution.

2.4 Diseases associated with crowding

Population displacement caused by cyclone damage and flooding can result in overcrowding in resettlement areas, raising the risk of transmission of certain communicable diseases. **Measles** (see section below on vaccine-preventable diseases), **ARI, diphtheria and pertussis** are transmitted from person to person, and the risks are increased in situations of forced relocation to shared areas which often have

inadequate shelter. Overcrowding can also increase the likelihood of transmission of meningitis, waterborne and vector-borne diseases.

ARI. Acute respiratory infection includes any infection of the upper or lower respiratory system. A major concern in Myanmar is acute lower respiratory tract infection (ALRI) in children under five (pneumonia, bronchiolitis and bronchitis). ALRI kills more children globally than any other disease. The under-five mortality rate for Myanmar in 2004 was 106 / 1 000 live births (UNICEF 2006) of which 90% of deaths were caused by pneumonia.

Low birth weight, malnourished and non-breastfed children and those living in overcrowded conditions are at higher risk of acquiring pneumonia. These children are also at a higher risk of death from pneumonia.

Prevention is key, including early recognition and detection, immunization (measles, HIB and pneumococcal conjugate vaccines), adequate nutrition and exclusive breastfeeding. Infants of less than six months of age, who are not breastfed, have a risk of dying from pneumonia five times greater than infants who are exclusively breastfed for the first six months.

Early detection and case management of pneumonia and other common illnesses, guided by the Integrated Management of Childhood Illness (IMCI), will prevent unnecessary morbidity and mortality in children under five years of age. IMCI is being implemented in 112 of the 325 townships in Myanmar. The national IMCI guidelines could be used by trained health workers during and after the emergency and afterwards.

Pneumonia is a common opportunistic infection among HIV positive children worldwide. The pathogen responsible is found to be fungal (*P.jiroveci*) which is commonly referred to as PCP.

PCP causes a significant number of deaths among HIV-positive infants under the age of one. WHO and UNICEF recommend cotrimoxazole prophylaxis for all HIV-positive children, as well as for infants born to HIV-positive mothers, to prevent the development of pneumonia. (See section 4 *Child health in emergencies*)

Meningococcal disease outbreaks were first reported in 1992, 165 cases and then 65 in 1995. No reports have been received since 1998. The disease is spread from person to person through respiratory droplets of infected people. The disease occurs sporadically throughout the world with seasonal variations and accounts for a proportion of endemic bacterial meningitis.

Tuberculosis (TB) is a major public health problem and the burden is probably higher than currently estimated. In 2004, Myanmar was ranked 21/22 out of countries with the highest burden of TB (MoH). The absence of a secure supply of first line drugs poses a serious threat to the work of the National Tuberculosis Programme (NTP) and increases the risk of drug resistance and loss of public confidence in control services.

The NTP programme has reported increased numbers of cases each year. In 2006, the estimated incidence was 171/100 000 population/year. Mortality rate was 13/100 000 population/year. Among new cases, 2.6% are **HIV** positive and 4% are **multi-drug resistant TB** (WHO/UNAIDS).

In order to control TB, Myanmar has adopted the internationally recommended strategy, DOTS (Directly Observed Therapy). DOTS services are provided through the network of the National TB Programme (NTP) and are reportedly available in most of the health facilities (95% population coverage).

In the acute phase of this emergency, one of the main problems will be the interruption of anti-TB treatment provision. Given that there is a functioning NTP network, it is important that a strong collaboration be established with the NTP services. Other aspects of TB control can be addressed once emergency and basic health care have been re-established.

Pages 95 to 97 of the guideline *TB care and control in refugee and displaced populations* highlights the TB control issues that should be considered in situations of natural disasters (see section 4, Tuberculosis).

2.5 Vaccine-preventable diseases and routine immunization coverage

Measles. Myanmar reported 735 cases in 2006 but has not reported any recent outbreaks. Reports from the national authorities, WHO and UNICEF indicate measles vaccine coverage to be 78% (2006), a level that is insufficient to prevent transmission among populations of cyclone affected areas. No rubella cases have been reported. (See section 3.6 on recommendations for immunization).

Tetanus has a high case fatality rate of 70–100% and is globally under-reported. The incubation period is usually three to 21 days. In these circumstances all wounds and injuries should be scrutinized. *Clostridium tetani* spores, present in the soil, infect trivial, unnoticed wounds, lacerations and burns. Reports from the national authorities, WHO and UNICEF indicate an 82% DTP3 coverage (2006)

Appropriate management of injured survivors should be implemented as soon as possible to minimize future disability and to avert avoidable death following disasters. It was observed in Aceh, that a shorter incubation period is associated with severe disease and a worse prognosis. Health-care workers operating in disaster settings should be alerted by the occurrence of cases of dysphagia and trismus, often the first symptoms of the disease.

Maternal and neonatal tetanus, and its symptoms, is of particular concern. In Myanmar, under normal circumstances, 57% of mothers are attended by health-care staff at delivery.

(For management see section 3.4 *Essential medical and surgical care* and for relevant publications see section 4, *Wounds and injuries*.)

Polio . No cases of polio have been reported in 2008 (as of 5 May). The most recent case of wild polio was reported in May, 2007, in Rakhine. The case was imported from India via Bangladesh and led to an outbreak of 11 cases. The outbreak is now considered to be controlled following a series of vaccination rounds.

As populations become displaced, especially across national borders, due to the cyclone and floods, there is a risk of a new importation of wild polio virus upon their return weeks to months later, which may go undetected if the surveillance system is compromised. (For relevant publications, see section 4, *Polio, Recommended standards for polio surveillance*).

Table 1. Routine vaccination coverage at one year of age, 2006, Myanmar

Antigen	% coverage*
(BCG) bacille Calmette–Guérin	85
Diphtheria– tetanus– pertussis, 3rd dose	82
Hepatitis B, 3rd dose	75
MCV (measles-containing vaccine)	78
Polio, 3rd dose	82

* Official country estimates reported to WHO/UNICEF, as of 20/12/2007

2.6 Other risks and considerations

Injuries. Management may be complicated by longer delays in presenting for care and limited access of

skilled personnel to the affected areas. Risk of wound infection and tetanus are high due to the difficulties of immediate access to health facilities and delayed presentation of acute injuries. (For details see section 4 of this document, **Wounds and injuries**).

Snake Bites. The affected area is known as one of the highest snake bite areas in Myanmar and June sees the highest number. Annually, 8 000 snake bites occur with a CFR 10% (MoH). Myanmar has a shortage of Anti-Snake Venom (ASV) and it is essential that stocks are quantified and stockpiled in Myanmar to ensure it is readily available. Indian ASV **WILL NOT WORK**. Although the species is similar to the predominant snake, the Russell's viper (responsible for 80% of bites), it is a different sub-species. Other sources of appropriate ASV should be investigated urgently including the Thai Red Cross Society or, Venom Unit of the University for Medicine and Pharmacy in Ho Chi Min City. Both institutions are believed to have an ASV close to that required in Myanmar, in that they include the sub-species concerned. However it should be noted that dosages will change with different types of ASV. It is also likely that there will be a lack of new, clean, dry glass test tubes which are key to managing viper bites. (See section 4, *Snakebite management in emergencies*)

Skin infections. Infections occur not only due to overcrowding but also as a result of a lack of water and therefore reduced hygiene. These are known as 'water-washed' diseases and include miscellaneous diarrhoeas, skin/wound infections and infestations (e.g. scabies).

Sexually transmitted infections (STIs) including human immunodeficiency virus (HIV). When an emergency develops, people may be subjected to situations that substantially increase their exposure. Risk factors include massive displacement of people from their homes; women and children left to fend for themselves; prevalence of domestic violence; 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. The overall prevalence in the population is estimated to be 1-2% with 360 000 people living with the virus (UNAIDS, WHO 2005) although rates are higher in urban areas and among commercial sex workers and IDUs. 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 syringe exchange programmes should be maintained. Efforts should be made to ensure that HIV/AIDS patients receiving ART do not have their treatment interrupted and that ART is provided for prevention of pregnancy related HIV transmission. (For relevant publications, see section 4, *Gender and Gender based violence and HIV/AIDS*).

Avian influenza (A/H5N1). One human case of influenza A/H5N1 was reported in Shan State in December 2007, following an outbreak in poultry. There have been no highly pathogenic avian influenza outbreaks in poultry recorded since December 2007, however virus circulation cannot be excluded.

Environmental risks may exist from damaged industrial facilities (chemical, radiological). HCWs should bear in mind that patients' symptoms may be consistent with such causes. (For relevant publications, see section 4, *Environmental Health in Emergencies, UNEP/OCHA Environmental Risk Identification*).

Corpses. It is important to convey to all parties that corpses do not represent a public health threat. (For relevant publications, see section 4 *Management of dead bodies*)

Interrupted power supply. As a result of extended power supply interruption, food is likely to have been spoiled and could become a possible source of disease if consumed. Routine vaccine stocks and the cold chain are also likely to have been compromised.

Drug Donations. Inappropriate donations of medicines and medical supplies can be minimized by donors adhering to the interagency guidelines (See section 4). The key principles are :

- drug donations should not be a priority
- donated drugs should explicitly address the expressed official needs of the recipient country

- donated drugs must be on the national list of registered drugs
- donated drugs must be labelled in English or the national language
- the date of expiration of the drugs must be no less than one year from arrival in the country

Disposing of pharmaceuticals should be by high temperature incineration (i.e. above 1,200°C). Such incineration facilities, equipped with adequate emission control, are mainly to be found in the industrialized world. The cost of disposing of hazardous waste in this way ranges from US\$ 2 000 to US\$ 4 000 per ton.

Vaccinations and malaria prophylaxis recommended for staff deployed to Myanmar

Relief workers must bear in mind that situations may change in an emergency context and between different areas, with potential risks of epidemics. It is essential that medical preparation and protection is as comprehensive as possible (with the limitations imposed by departure at short notice).

A minimum period of time is needed to build up protective levels of antibodies after immunization that may require several injections. It is advised to plan as quickly as possible vaccination programs (if possible 2 weeks in advance). This notion and the duration of the mission may influence decisions and choices of vaccines in case of immediate departure.

Personal protection against mosquito bites day and night is an important measure to prevent vector born diseases like dengue (for which there is no vaccine) Japanese encephalitis and malaria (repellents, mosquito nets).

Basic knowledge on First Aid and Stress are important. Some of the teams may be confronted and have to deal with the handling of dead bodies. The emotional overload, which can be expected, in performing such an unusual and heavy task without specific training, can provoke significant reactions of traumatic stress and even lead to a psychological trauma, or a rapid onset of burn-out. Even if this is not always avoidable, good preparation can be useful for preventing and limiting stress. (For relevant publications, see section 4, *Travel advice*)

A - Vaccination recommendations:

	Vaccine	Validity	Comments
Essential			
	Diphtheria	10 years	Can be combined with tetanus
	Tetanus	10 years	Booster dose is recommended if not taken in the last 10 years
	Polio	10 years	Potential risk of importation of wild virus with displaced populations.
	Typhoid	3 years	
	Hepatitis A	life	If there is no proof of immunity by vaccine or illness, even if departure at short notice. Can be combined with Hepatitis B
	Hepatitis B	15 years	
	Cholera	6 months	If there is sufficient time to receive the 2 oral doses to be taken at one week interval before departure. (Immunity is obtained one week after the second dose of a combination Oral cholera & ETEC (enterotoxigenic, E.Coli) vaccine (Brand name DUKORAL).
Optional	Meningitis ACYW 135	3 years	No recent outbreak, but potential risk of cases in such context (prolonged mission)
	Measles		Potential risk in emergency situation. If not fully immunized in childhood, consider vaccination
NB: A Yellow Fever vaccination certificate is required from travelers coming from infected areas			

B - Malaria prophylaxis and treatment

Malaria prophylaxis is recommended for all staff deployed (although there seems to be no risk at the moment in Yangon the situation can rapidly evolve and change within a month).

Recommended prophylaxis regimen Type IV. Risk predominantly due to *P.falciparum*.

Mosquito bite prevention plus medication:

Medication	Start of treatment	Dosage
Atovaquone 250 mg & Proguanil 100 mg (Malarone)	The day before exposure	One tablet daily until 7 days after last exposure
Doxycycline 100 mg	The day before exposure	One tablet daily until 4 weeks after last exposure
Mefloquine 250 mg NB: resistance reported in Kayin state and eastern part of Shan state.	A week before exposure	One tablet weekly until 4 weeks after last exposure

Reserve treatment is recommended for all missions of more than 8 days in view of the potential difficulty to seek local care. **Artemether-Lumefantrine** combination tablet (eg **Coartem** 20/120)

C - Other precautions

To consider for teams

- Medical kits
- PEP kit
- Surgical masks
- Gloves
- Food and drinks: bear in mind that there will be an extreme shortage of basic food and drinking water.

Table 2. Specific priority interventions for immediate implementation

<ul style="list-style-type: none"> • Shelter - plastic sheeting • Potable water supply • Food security • (Mobile) health clinics with case management protocols and treatment for likely high-burden conditions (DD, ARI, fever/malaria, trauma) • Trauma/wound care with aggressive implementation of tetanus prophylaxis • Measles vaccination of children 6 months - 15 years, particularly in crowded camps/settlements, with Vitamin A to children < 5. • Outbreak preparedness plans and stockpiling for outbreak-prone diseases notably cholera, dengue, Sd1 • Continuation (or resumption) of treatment for those on ARV and anti-TB medications • Monitoring prevalence of malnutrition and supporting key interventions, e.g. treatment of malnutrition, promotion of appropriate infant and young child feeding practices. • Early warning and immediate reporting of outbreak alerts to MOH/WHO
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3. IMMEDIATE INTERVENTIONS FOR COMMUNICABLE DISEASE CONTROL

3.1 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 15–20 litres** of clean water per day.
- **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 free chlorine in the water should be 0.5 mg/litre, which can be determined by using a simple 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.

3.2 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 (UNHCR), aimed at preventing diseases related to overcrowding or lack of ventilation, 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. Women should be included in planning and implementation of shelter and food distribution activities.
- Waste should be disposed in a pit, away from shelters and protected from rodents to reduce the exposure of the population to rodents and other vectors of disease.
- Shelters should be equipped with LLIN for each sleeping space to prevent malaria transmission. Where housing conditions allow, indoor residual spraying IRS can be carried out if >85% IRS coverage of dwellings in the locality can be assured.

3.3 Management of Malnutrition

- Infants born into populations affected by the emergency should normally start breastfeeding within one hour of birth and continue breastfeeding exclusively (with no food or liquid other than breast milk, not even water) until 6 months of age. The aim should be to create and sustain an environment that encourages frequent breastfeeding for children up to 2 years of age. Infants who are not breastfed are vulnerable to infection and diarrhoea. See guidelines section 4.
- Myanmar has low rates of exclusive breast feeding, 14.7% of children are exclusively breastfed until four months (UNICEF 2003). Exclusive breastfeeding should be encouraged. Milk powder supplies usually increase in emergency situations, which tends to further exacerbate the low percentage of exclusive breast feeders. The distribution of breast milk substitutes (such as milk powder) needs to be strictly controlled so there is no "spill over" and further reduction in exclusive breastfeeding. Only infants who have no access to breast milk need an adequate supply

of appropriate breast milk substitutes. In those cases, health care providers including mothers should be provided with guidance on the safe preparation of powdered infant formula products.

- Bacterial infections are very common in severely malnourished children on initial admission to hospital. Clinical management of severely 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).
- Populations dependant on food aid need to be given a food ration that is safe and adequate in terms of quantity and quality (covering macro - and micronutrient needs). Infants from 6 months onwards and older children need hygienically prepared, and easy-to-eat, digestible foods that nutritionally complement breast milk. Regular assessments of households' access to food (including costs in the market) need to be undertaken and emergency food aid needs to be adapted accordingly. Household's access to facilities for the safe preparation of their food should also be assessed on a regular basis and emergency supplies of necessary utensils and appropriate energy sources for cooking should be adapted accordingly.
- After the acute phase of the emergency, efforts should be made to improve household access to food in a more sustainable way (e.g. seed distribution, land/crop management, income generation activities) and to institute appropriate child feeding and caring practices, including diversifying diets and improved hygiene. It is important to emphasize that poor hand hygiene exacerbates the spread of diarrhoeal diseases, even in the presence of adequate nutrition.

3.4 Case management

Essential medical and surgical care

- Priority must be given to providing emergency medical and surgical care to people with **injury-related conditions** which 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.

Case management of communicable diseases

- 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-care facilities with agreed-upon first-line drugs is crucial to ensure effective diagnosis and treatment for ARI, the main epidemic-prone diseases (including cholera, dysentery, shigellosis, typhoid, dengue and DHF, hepatitis, leptospirosis, measles, malaria, and meningitis) and STIs.
- Standard **infection control practices** in accordance with national protocols should also be in place.
- **Malaria treatment**; In 2002 the MoH adopted artemisinin-based combination therapy (ACT) to be used in the artesunate + mefloquine (AS+MQ) option. However because of costs and access to AS+MQ the country opted for the artemether-lumefantrine (coartem) as first-line treatment for confirmed, uncomplicated *P. falciparum* cases.
 - In Feb 2008, WHO convened a Malarial Drug Policy meeting in Yangon and treatment options were updated as follows:
 - Uncomplicated malaria - artemether - lumefantrine; or artesunate+mefloquine; or dihydroartemisinin - piperazine
 - Severe malaria - artesunate (IV) and follow through with full course ACT for complete treatment
 - Laboratory-confirmed vivax malaria: chloroquine plus primaquine
- **Tetanus**: appropriate management of injured survivors should be implemented as soon as possible to minimize future disability and to avert avoidable death following disasters.
- Provision of **anti-TB** treatment must be ensured for TB patients who were previously receiving 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.

3.5 Surveillance/early warning and response system

The purpose of the surveillance/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 to use, uniform in style and include **standard case definitions** and reporting forms (see section 5 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;
- ensure that data is forwarded to the local ministry of health authorities and the WHO office.

3.6 Immunization

- In crowded or camp settings, vaccination using a **measles-containing vaccine**, together with **vitamin A supplementation**, as an immediate priority health intervention (at least 20% of children are vitamin A deficient). All children aged 6 months to 14 years should receive measles vaccine, regardless of previous vaccination or disease history, with Vitamin A supplementation for children aged 6 months to 59 months. Priority could be given to vaccinate children in areas

with low vaccination coverage. Revaccination of infants who received their first dose of measles vaccine at 6-8 months of age is recommended; the minimum interval between doses is one month.

- A single suspect measles case is sufficient to prompt the immediate implementation of activities to control measles.
- If rubella transmission is detected, consideration should be given to vaccinating women of childbearing age (aged 15–35 years). The vaccine of choice is **combined measles–rubella vaccine**.
- Given the threat of reintroduction of **poliomyelitis** into the area, every opportunity should be taken, if feasible, to give **OPV** (oral poliovirus vaccine) to all children aged <5 years.
- 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 floodwaters. 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. (see section 4 Diarrhoeal Diseases).
- Special attention should be paid to the safe management and disposal of waste from immunization activities to prevent the transmission of blood-borne pathogens.

3.7 Vector control and personal protection

- Long-lasting Insecticide-treated bednets, should be made universally available, with priority given to pregnant women and children aged <5 years.
- 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.

3.8 Health education: basic messages

In the current crisis in Myanmar, it may not be possible to implement all of the following recommendations. More detailed practical advice is available in section 4 Diarrhoeal diseases in the Guidelines for Control of Shigellosis

Safe water

- Even if it looks clear, water can contain germs. Under the present emergency in Myanmar, water in the affected areas should be assumed to be contaminated.
- Add drops of chlorine to the water, or boil, before drinking or using for food preparation..
- 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 single 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 for fetching drinking-water (stream, river or water hole).
- In normal circumstances delta area water sources are likely to be surface, these should be assumed to be contaminated. Further inland 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.
- Do not allow refuse and stagnant water to collect 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.
- Promote breastfeeding of infants and young children.
- Water should be considered to be contaminated and made safe through boiling or treatment with chlorine before it is consumed or used in food.
- Safe food is particularly important for infants, pregnant women and the elderly who are most susceptible to foodborne diseases.
- 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

- Diagnosis and treatment of fever, within 24hrs of onset of symptoms can be life-saving.
- Early diagnosis and treatment diarrhoea (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/>

Avian Influenza

http://www.who.int/topics/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

Child health in emergencies

http://www.who.int/child_adolescent_health/documents/emergencies/en/index.html

Acute respiratory tract infections in children

http://www.who.int/fch/depts/cah/resp_infections/en/

IMCI Chart Booklet

http://www.who.int/child_adolescent_health/documents/IMCI_chartbooklet/en/index.html

IMCI Documents

http://www.who.int/child_adolescent_health/documents/imci/en/index.html

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/>

Shigella antimicrobial resistance

Increasing spectrum in antimicrobial resistance of Shigella isolates in Bangladesh: resistance to azithromycin and ceftriaxone and decreased susceptibility to ciprofloxacin. [Rahman M](#), [Shoma S](#), [Rashid H](#), [El Arifeen S](#), [Baqui AH](#), [Siddique AK](#), [Nair GB](#), [Sack DA](#). *J Health Popul Nutr*. 2007 Jun; 25(2):158-67. Laboratory Sciences Division, ICDDR,B GPO Box 128, Dhaka 1000 (Mohakhali, Dhaka 1212), Bangladesh. mahbubur@icddr.org

Oral cholera vaccine use in complex emergencies: What next? Report of a WHO meeting. Cairo, Egypt, 14–16 December 2005. WHO/CDS/NTD/IDM/2006.2.

http://www.who.int/cholera/publications/cholera_vaccines_emergencies_2005.pdf

Background document: the diagnosis, treatment, and prevention of typhoid fever

http://whqlibdoc.who.int/hq/2003/WHO_V&B_03.07.pdf

Environmental health in emergencies

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

<http://ochaonline.un.org/News/OCHANewsCentre/SituationReports/tabid/1094/Default.aspx>

Food safety

Ensuring food safety in the aftermath of natural disasters

http://www.who.int/foodsafety/foodborne_disease/emergency/en/

5 Keys to safer food : simple advice to consumers and food handlers

<http://www.who.int/foodsafety/consumer/5keys/en/index.html>

5 key to safer food poster (Myanmar version):

http://www.who.int/foodsafety/publications/consumer/en/5keys_myanmar.pdf

Safe preparation of powdered infant formula :

<http://www.who.int/foodsafety/publications/micro/pif2007/en/index.html>

Guidelines for Drug Donations

http://whqlibdoc.who.int/hq/1999/WHO_EDM_PAR_99.4.pdf

Hepatitis

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/>

Gender & Gender-Based Violence

IASC Guidelines for Gender-based Violence Interventions in Humanitarian Settings (2005)

http://www.humanitarianinfo.org/iasc/content/products/docs/tfgender_GBVGuidelines2005.pdf

IASC Gender Handbook in Humanitarian Action Women, Girls, Boys and Men Different Needs – Equal Opportunities (2006)

[http://www.humanitarianinfo.org/iasc/content/documents/subsidi/tf_gender/IASC%20Gender%20Handbook%20\(Feb%202007\).pdf](http://www.humanitarianinfo.org/iasc/content/documents/subsidi/tf_gender/IASC%20Gender%20Handbook%20(Feb%202007).pdf)

WHO/UNHCR Clinical management of rape survivors: Developing protocols for use with refugees and internally displaced persons 2004 - Revised edition

http://www.who.int/reproductive-health/publications/clinical_mngt_rapesurvivors/

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>

http://www.who.int/malaria/docs/ce_interagencyfhbook.pdf

http://www.who.int/malaria/docs/dip_mal0508.pdf

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

Manual on the management of nutrition in major emergencies.

<http://whqlibdoc.who.int/publications/2000/9241545208.pdf>

Operational Guidance on Infant and Young Child Feeding in Emergencies

<http://www.enonline.net/ife/resources.aspx>

WHO Policy on optimal feeding of infants and young children in emergencies

<http://www.enonline.net/ife/view.aspx?resid=103>

WHO, UNICEF, ICRC + IFRC Appropriate infant and young child feeding

http://www.who.int/child_adolescent_health/documents/asian_support/en/index.html

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&suiwant=16>

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

Mental health in emergencies

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

IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings 2007

<http://www.humanitarianinfo.org/iasc/content/products/docs/Guidelines%20IASC%20Mental%20Health%20Psychosocial.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/

Ministry of Health Myanmar

<http://www.moh.gov.mm/>

Laboratory specimen collection

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

Polio

http://www.who.int/immunization_monitoring/diseases/poliomyelitis_surveillance/en/index.html

Snakebite Management in Emergencies

<http://www.searo.who.int/en/Section10/Section17/Section53/Section1024.htm>

Travel advice

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

Food safety for travellers

<http://www.who.int/foodsafety/publications/consumer/travellers/en/index.html>

WHO International Travel and Health 2008

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

Tuberculosis

Tuberculosis care and control in refugee and displaced populations. WHO 2007.

http://whqlibdoc.who.int/publications/2007/9789241595421_eng.pdf.

Vaccines and biologicals for emergencies

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

Vector control

http://whqlibdoc.who.int/hq/2006/WHO_CDS_NTD_WHOPEP_GCDPP_2006.1_eng.pdf

Wounds and Injuries

Guidelines for essential trauma care. WHO 2004.

<http://whqlibdoc.who.int/publications/2004/9241546409.pdf>

Prehospital trauma care systems. WHO 2005.

http://www.who.int/violence_injury_prevention/publications/services/39162_oms_new.pdf

Integrated Management for Emergency and Essential Surgical Care toolkit

<http://www.who.int/surgery/publications/imeesc/en/index.html>

<http://www.who.int/surgery/publications/BestPracticeGuidelinesonESCinDisasters.pdf>

Example of cluster of tetanus cases in Aceh, Indonesia, post Asian Tsunami disaster

Aceh epidemiology group. Outbreak of tetanus cases following the tsunami in Aceh province, Indonesia. *Global Public Health*. 2006

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.