

# **Communicable disease risk assessment and interventions**

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Post-election emergency: Kenya

February 2008



**World Health  
Organization**

Communicable Diseases Working Group on Emergencies, WHO headquarters  
Communicable Disease Surveillance and Response, WHO Regional Office for Africa  
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# Contents

<b>Acknowledgements .....</b>	<b>1</b>
<b>1. Background and risk factors .....</b>	<b>3</b>
<b>2. Priority communicable diseases .....</b>	<b>5</b>
<b>3. Interventions for communicable disease control .....</b>	<b>10</b>
<b>4. Relevant publications .....</b>	<b>17</b>
<b>5. WHO-recommended case definitions .....</b>	<b>20</b>

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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 emergency-affected population in Kenya.

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

Kenya is a low-income, food-deficient country with a population of 34 million and a per capita yearly income of USD 1 037. In 2007, Kenya's position on the UNDP human development index was 148th of 177 countries. About 58% of the population lives below the poverty line. Kenya's economy is highly dependant on tourism. Economic productivity is unevenly distributed between the central areas, characterized by high population density, commercial agriculture, industries and improving standard of living, and the sparsely populated peripheral areas, characterized by pastoralism and subsistence agriculture. Vulnerability to drought and food shortages is widespread in the arid and semi-arid districts located in the northern, coastal and central provinces. Kenya is also home to an estimated 238 000 refugees, mainly from Sudan and Somalia, and 360 000 internally displaced persons<sup>1</sup>.

Major health problems in Kenya, which could be exacerbated by this crisis, relate to communicable diseases and malnutrition, especially in children. As of 2005, 20% of children were assessed to be moderately to severely under-weight<sup>2</sup>. Major causes of death in all ages are HIV/AIDS, respiratory infections and diarrhoeal diseases<sup>3</sup>.

On 27 December 2007 Kenya held nationwide government elections. The results were widely disputed, leading to conflict between opposition and government supporters. Violence, which began in densely-packed urban areas, quickly spread to rural areas. The deteriorating security environment has led to targeted killings and reprisals, widespread looting and burning, massive population displacement, and numerous reports of rape and sexual violence. As of 31 January, more than 800 people were reported to have been killed and hundreds of thousands displaced by the violence<sup>4</sup>.

Kenya is divided administratively into 8 provinces (mkoa), which are composed of 71 districts (wilaya'at) and subdivided into 262 divisions (tarafa). The countrywide post-election violence has significantly affected six of the eight provinces - Nairobi, Coast, Western, Central, Rift Valley, and Nyanza provinces - including the cities of Nairobi, Mombasa, and Kisumu.

The violence and insecurity has led to widespread closure of health clinics. WHO reports 30% of the health facilities in some areas closed, mainly due to staff displacements and insecurity, with burning, looting, and vandalism of some health facilities<sup>5</sup>. Access to the public health system is therefore severely affected, adversely impacting all aspects of health-care delivery including the capacity of the surveillance system to detect and respond to epidemics. Displaced populations lack food, water, fuel and access to health care.

WHO is leading the health cluster and participating in initial rapid assessments and UN joint assessment teams in the most affected areas as security permits. WHO-Kenya has deployed a field team to Nakuru in Rift Valley province to assist local health authorities and assess the situation, but has been affected by the deteriorating security environment.

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<sup>1</sup> WHO. Kenya country profile, 2006. Available at: <http://www.who.int/hac/crises/ken/en/index.html>

<sup>2</sup> UNICEF. Country statistics Kenya. Available at: [http://www.unicef.org/infobycountry/kenya\\_statistics.html](http://www.unicef.org/infobycountry/kenya_statistics.html)

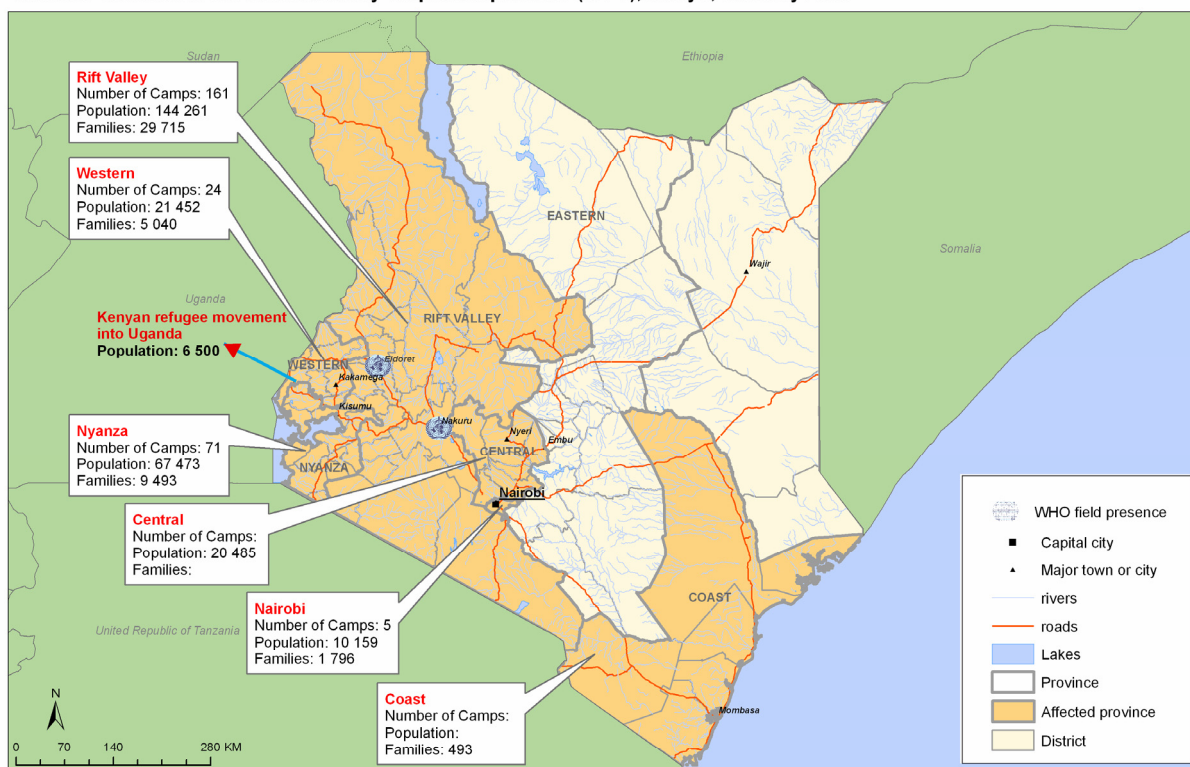
<sup>3</sup> WHO. Country health system fact sheet 2006, Kenya. Available at: [http://www.afro.who.int/home/countries/fact\\_sheets/kenya.pdf](http://www.afro.who.int/home/countries/fact_sheets/kenya.pdf)

<sup>4</sup> OCHA Kenya Weekly Humanitarian Update vol 2, 21 - 28 Jan 2008

<sup>5</sup> WHO. Kenya situation report #7, 26 January 2008. Available at: <http://www.who.int/hac/crises/ken/sitreps/en/index.html>

**Figure 1**

**Violence-affected areas and internally displaced persons (IDPs), Kenya, January 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. © WHO 2008. All rights reserved.

Data Source: Kenya Red Cross Society, HAC/WHO  
Map Production: Public Health Mapping and GIS  
World Health Organization.

## Risk factors for increased communicable disease burden

1. **Interruption of access to safe water and sanitation facilities.** The populations displaced by violence 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 increased incidence of **ARI**. Increased risk of **meningitis** transmission is also associated with overcrowding in general.
3. **Malnutrition and transmission of communicable diseases.** The combination of malnutrition and communicable diseases is potentially a significant public health problem, particularly among 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.
4. **Increased exposure to disease vectors.** Displacement of populations can result in greater exposure to disease-carrying vectors, increasing the risk of **malaria**, **dengue**, and **chikungunya fever**, as well as other less common illnesses such as **Rift Valley fever**, **yellow fever**, **human African trypanosomiasis**, and **plague**. Risk of **malaria** is increased for people moving from low malaria risk areas into endemic regions such as Western Kenya, Nyanza and Coast.

5. **Poor access to health services** is of immediate concern. The deterioration of security and the degradation of the health infrastructure prevent access to usual services, as well as to emergency medical and surgical services put in place in response to this crisis.
6. **Gender-based violence.** Disruption of families and communities due to displacement can leave women and children vulnerable to rape and sexual violence, lead to commercial sex work, and increase the risk of **HIV** and **sexually transmitted infections (STI)**.

## 2. PRIORITY COMMUNICABLE DISEASES

### 2.1 Waterborne and foodborne diseases

The displaced populations in Kenya are at risk from outbreaks of waterborne and foodborne diseases due to the reduced access to usual water and sanitation systems. **Cholera, typhoid, hepatitis A and E, *Entamoeba histolytica* and *Shigella dysenteriae* type 1(Sd1)** have all been reported previously in the affected areas. Usual water sources abandoned during displacement may result in unsafe drinking water being consumed.

In 2007, cases and deaths from **cholera** were reported from the areas of West Pokot, South Turkana, Mandera, Wajir, Garissa, Kwale, Kisumu, Siaya, Bondo, Nyando and Busia, and, in 2006, from Kwale, Mombasa, Moyale, and Kakuma<sup>1</sup>. Population displacement, crowding, poor access to safe water, inadequate hygiene and toilet facilities, high prevalence of HIV/AIDS, and unsafe food preparation and handling practices are all associated with transmission. Since the onset of the violence and resulting displacement, reports of cases of diarrhoeal disease have been received and are being investigated<sup>2</sup>.

**Brucellosis** is common among the pastoral communities of the Rift Valley, and is associated with the consumption of unpasteurized milk. Disruptions in the supply chain of milk could increase the risk of transmission.

### 2.3 Vector-borne diseases

*P. falciparum* **malaria** is a major public health problem in Kenya, with malaria burden and transmission patterns varying across the country, due largely to climatic and temperature variations (including the effects of altitude). Malaria accounts for one third of outpatient clinic visits; about 70% of the Kenyan population is at risk of contracting malaria. Malaria is the leading cause of death in children under five years of age, and is responsible for one quarter of childhood deaths. Four malaria epidemiological zones have been identified: (i) perennial high transmission near Lake Victoria and the south coast; (ii) high transmission with seasonal fluctuations (in response to rains) adjacent to the areas with perennial transmission; (iii) stable transmission with seasonal rainfall-associated peaks in most of the semi-arid and western highland regions (large parts of north eastern, north western and central area of Kenya); and (iv) low transmission risk in the arid and mountain regions (highlands, Central Province and Nairobi)<sup>3</sup>.

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<sup>1</sup> WHO Alert and Response Operations. Personal communication 30 January 2008.

<sup>2</sup> WHO. Kenya situation report #9, 26 January 2008. Available at: <http://www.who.int/hac/crises/ken/sitreps/en/index.html>

<sup>3</sup> WHO. Roll Back Malaria monitoring and evaluation. Malaria country profile 2005, Kenya.

Displaced populations, particularly in the high-transmission areas near Lake Victoria and the south coast, may be at increased risk due to inadequate shelter and increased exposure to vectors. In addition, displaced populations moving from lower-risk to higher-risk epidemiological zones are at increased risk of malaria.

Leptospirosis is endemic in the Rift Valley area of Kenya and large outbreaks have occurred<sup>1</sup>. Transmission is particularly associated with areas of flooding and poor drainage.

Major outbreaks of **Rift Valley fever (RVF)** occur periodically in semi-arid, dry scrub and low acacia lands of Kenya, usually following episodes of flooding. Large outbreaks have occurred following flooding in Kenya in 1997–98 and again in 2006–2007.

**Yellow fever** is endemic in Kenya. Risk of transmission may increase 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. The last outbreak of yellow fever in Kenya occurred in 1993.

An (unpublished) serosurvey in 2005 showed **dengue** transmission in coastal and inland parts of Kenya and sporadic cases have been reported, however, no outbreak has occurred in the area since the early 1980s. The likelihood of a Dengue/DHF outbreak in this current crisis is therefore low.

**Plague** is also endemic in Kenya. The last recorded outbreak occurred in the Machakos district in 1990, with 44 reported cases, including 8 deaths. Displaced populations, who may have increased exposure to rodents and flea vectors, could have an increased risk of plague.

**Chikungunya fever** is a mosquito-borne viral illness characterized by fever, chills, joint pain, and rash. It is endemic to Kenya. In August 2004, an outbreak of an acute febrile illness with severe joint pain was reported in Lamu, Kenya, and was subsequently laboratory-confirmed as chikungunya. In November 2004, the virus was also identified in Mombasa<sup>2</sup> (currently there are no large displaced populations in Mombasa).

**Visceral leishmaniasis (Kala-Azar)** cases were reported from the Wajir district of northern Kenya in 2006<sup>3</sup>. Population displacement may increase the risk of exposure to the phlebotomine sand fly vector, although symptoms may not occur for weeks to months following exposure. Cutaneous leishmaniasis has been reported around Mt. Elgon.

**Human African trypanosomiasis** was last reported in Kenya in 2002. Trypanosomiasis due to *T.b. rhodesiense* is endemic in animals in western Kenya, and population displacement may increase exposure to the tsetse fly vectors and the life cycle of the parasite.

Displaced populations may also have a higher risk of exposure to the vectors of **relapsing fever** and **lymphatic filariasis**, increasing the risk of transmission. And finally, sporadic cases of **Marburg hemorrhagic fever** were reported in the 1980's from the Mt Elgon area, but were associated with very specific exposures. No cases have since been reported.

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<sup>1</sup> WHO Disease Outbreak news. Leptospirosis in Kenya. 17 June 2004. Available at: [http://www.who.int/csr/don/2004\\_06\\_17a/en/index.html](http://www.who.int/csr/don/2004_06_17a/en/index.html)

<sup>2</sup> Bedno S, Onyango C, Njuguna C, et al. Outbreak of chikungunya in Lamu, Kenya, 2004 [abstract 206]. In: Program and abstracts of the 5th International Conference on Emerging Infectious Diseases (Atlanta). Atlanta: Centers for Disease Control and Prevention, 2006:117.

<sup>3</sup> Horn of Africa drought crisis: Health review August 2006. Inter agency standing committee (IASC) health cluster. Available at: <http://www.emro.who.int/eha/pdf/Horn%20of%20Africafinalaugust06pdffinal1.pdf>

## 2.4 Diseases associated with crowding

Population displacement can result in crowding in resettlement areas, raising the risk of transmission of certain communicable diseases. **Measles** (see section below on vaccine-preventable diseases), **ARI**, **diphtheria**, **meningococcal disease**, and **pertussis** are transmitted from person to person, and risk is increased in situations of forced relocation into shared areas which often have inadequate shelter. Crowding can also increase the likelihood of transmission of waterborne and vector-borne diseases.

**Meningococcal 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. However, the highest burden of the disease is due to the cyclic epidemics occurring in the African meningitis belt, which encompasses the northern part of Kenya. From 1 January to 26 February 2006, the Ministry of Health reported a total of 74 cases and 15 deaths (20% CFR) in 4 divisions (Alale, Chepareria, Kachelila and Kasei) of West Pokot, an area bordering Uganda<sup>1</sup>. A mass immunization campaign was mounted in response to the outbreak.

**Tuberculosis (TB)** is a major public health problem in Kenya. In 2005 the country was ranked 10th of the 22 high-burden countries which account for 80% of global TB cases. Approximately 220 000 people annually develop TB-disease in Kenya (incidence: 641/100 000 population). Kenya has adopted the new STOP TB strategy and has been implementing its various components, including the DOTS Strategy. DOTS services are provided through the network of the National TB Program (NTP) and are available in most of the health facilities of the Ministry of Health. Over 100 000 patients were enrolled in DOTS in 2005 in Kenya. The treatment success rate was reported to be 80% in 2004 (the global target for the treatment success rate is 85%). The TB case detection rate is estimated by WHO to be 43%, below the 70% global target. Laboratory infrastructure and performance are weak<sup>2</sup>.

The NTP has implemented initiatives aimed at increasing the involvement of other health sectors, as well as communities, with a view to increase case-finding and improve the quality of TB control services. Current initiatives in TB/HIV have been strengthened and, by the end of 2006, collaborative TB/HIV activities had been expanded to 70% of districts. HIV testing of TB patients has increased rapidly, with 60% of all TB patients being tested for HIV by the last quarter of 2006. The prevalence of HIV infection among TB patients was 57% in 2005. Twenty percent of the HIV-positive TB patients receive ARVs<sup>3</sup>.

In the acute phase of this emergency, one of the main problems is the interruption of anti-TB treatment provision. NGOs providing TB care and treatment in Kenya have recently reported treatment interruption in 30% of patients on tuberculosis therapy in Kibera in Nairobi. Patients are staying away from health centres in some areas for fear of being attacked. Visiting patients in their homes has also become difficult due to security concerns. Given that there is a functioning NTP network with successful TB control provisions, it is important that strong collaboration among the NTP services is established. It is important that patients already receiving anti-TB treatment continue to receive treatment throughout the acute phase of the emergency, in line with the directives of the NTP policy. Other aspects of TB control can be addressed once basic health-care services are re-established.

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<sup>1</sup> WHO Disease Outbreak news. Meningococcal disease in Kenya. 3 March 2006. Available at: [http://www.who.int/csr/don/2006\\_03\\_03a/en/index.html](http://www.who.int/csr/don/2006_03_03a/en/index.html)

<sup>2</sup> Global Tuberculosis Program, WHO 2007 report Kenya.

<sup>3</sup> Global Tuberculosis Program, WHO 2007 report Kenya.

## 2.5 Vaccine-preventable diseases and routine immunization coverage

**Measles.** Kenya is currently listed as a priority country for measles mortality reduction by the Measles Initiative. In 2006, measles vaccination coverage in Kenya, by 12 months of age was 77% - below that required to prevent transmission. A large and prolonged outbreak in 2005 and 2006 resulted in over 2500 cases and 24 documented deaths. In 2006, a nationwide supplementary immunization campaign for all children aged 9 to 59 months was carried out and 5 million children received measles vaccine and vitamin A (>100% of targeted population)<sup>1</sup>. However, vaccination coverage may be insufficient to prevent transmission among populations of emergency-affected areas, especially among cohorts born since the campaign in mid-2006. See section 3.7 on recommendations for immunization.

**Tetanus** is associated with poor treatment of wounds among population with low levels of immunization (the coverage of DPT3 among children at 12 months was 80% in Kenya in 2006). *Clostridium tetani* spores, present in the soil, infect trivial, unnoticed wounds, lacerations and burns. The incubation period is usually 3–21 days, and the case-fatality rate is 70–100%.

Examples of tetanus-prone wounds include:

- wounds contaminated with dirt or faeces;
- puncture wounds;
- burns;
- wounds with delayed presentation.

In circumstances of poorly treated trauma, all wounds and injuries should be viewed with a high degree of suspicion. Appropriate management of injuries should be implemented as soon as possible to minimize future disability and to avert avoidable death. Patients should systematically receive prophylactic antibiotics and tetanus toxoid vaccine if non-immune, together with tetanus immune globulin if the wound is tetanus-prone.

Maternal and neonatal tetanus are of particular concern during this emergency due to difficulties in accessing health-care services, potentially worsening the already low rate of attendance by health-care staff at delivery (42%)<sup>2</sup>.

For management see section 3.1, **Essential trauma and medical care** and for relevant publications see section 4, **Wounds and injuries**, *WHO Integrated Management for Emergency and Essential Surgical Care toolkit*.

**Polio** is not currently endemic in Kenya, however, re-importation is a threat. A three-year-old patient with AFP reported from Dadaab refugee camp in 2006 was confirmed as having WPV1, and was the first polio case in Kenya in 22 years. This was believed to be due to virus importation from Somalia approximately 8 months earlier, suggesting circulation of the virus within Kenya during that time. Follow-up campaigns in north-eastern Kenya in late 2006 have improved the polio vaccination coverage, but AFP surveillance and reporting is critical to ensure early detection and reporting of AFP cases. For relevant publications, see section 4, **Polio**, *Recommended standards for polio surveillance*.

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<sup>1</sup> Progress in measles control-Kenya 2002-2006. MMWR. Available at: <http://www.cdc.gov/MMWR/preview/mmwrhtml/mm5637a5.htm>

<sup>2</sup> UNICEF, country statistics, Kenya. [http://www.unicef.org/infobycountry/kenya\\_statistics.html](http://www.unicef.org/infobycountry/kenya_statistics.html)

**Table 1: Routine vaccination coverage at one year of age, 2007, Kenya**

<b>Antigen</b>	<b>% coverage*</b>
(BCG) bacilli Calmette–Guérin	85
Diphtheria–pertussis–tetanus, 3rd dose	76
Hepatitis B, 3rd dose	76
MCV (measles-containing vaccine)	69
Polio, 3rd dose	70

\* Official country estimates reported to WHO/UNICEF, as of 29/1/2008<sup>1</sup>

## **2.6 Other risks**

**Injuries** sustained due to violence. Management may be complicated by greater delays in presenting for care and limited access of skilled personnel to the affected areas. Risk of wound infection, septic complications and tetanus are high, due to the difficulties with immediate access to health facilities and delayed presentation of acute injuries. For details see section 4 of this document, **Wounds and injuries**, *WHO Integrated Management for Emergency and Essential Surgical Care toolkit*.

**Chronic disease.** Patients with chronic disease may experience an interruption of routine supply of medication.

**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. The overall prevalence of HIV infection in the population is estimated to be 6.1%, with 1 300 000 people (of whom 740 000 are women over age 15) living with the virus<sup>2</sup>. 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 AIDS patients receiving ART do not have their treatment interrupted and that ART is available 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)** has not been reported in Kenya.

<sup>1</sup> UNICEF, country statistics, Kenya. [http://www.unicef.org/infobycountry/kenya\\_statistics.html](http://www.unicef.org/infobycountry/kenya_statistics.html)

<sup>2</sup> Kenya: Epidemiological fact sheets on HIV/AIDS and sexually transmitted infections. UNAIDS/WHO working group on global HIV/AIDS and STI surveillance. December 2006

**Table 2: Specific priority interventions for immediate implementation**

- Trauma/wound care with aggressive implementation of tetanus prophylaxis.
- (Mobile) health clinics with case management protocols and treatment for likely high-burden conditions (DD, ARI, fever/malaria, trauma).
- Continuation (or resumption) of treatment for those on ARV and anti-TB medications.
- Measles vaccination of children 6 months–15 years, particularly in crowded camps/settlements, with Vitamin A to children < 5.
- Long-lasting ITN distribution to households (priority age <5 and pregnant women).
- Outbreak preparedness plans and stockpiling for outbreak-prone diseases, notably cholera, malaria, meningitis, measles.
- Monitoring of prevalence of malnutrition.
- Disease surveillance/early warning for immediate reporting of outbreak alerts to MOH/WHO.

### **3. 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.
- 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 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, 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.

## 3.3 Management of malnutrition

- 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).
- Infants born into populations affected by the emergency should normally be exclusively breastfed from birth to 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. The quality, distribution and use of breast milk substitutes at emergency sites should be strictly controlled. Infants who are not breastfed are vulnerable to infection and to developing diarrhoea. See guidelines section 4.
- Kenya has low rates of exclusive breast feeding (13% of infants less than 6 months of age are exclusively breastfed)<sup>1</sup>. Exclusive breastfeeding should be promoted. 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.
- Populations dependant on food aid need to be given a food ration that is 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.
- 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.

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<sup>1</sup> UNICEF, country statistics, Kenya. [http://www.unicef.org/infobycountry/kenya\\_statistics.html](http://www.unicef.org/infobycountry/kenya_statistics.html)

## 3.4 Case management

### Emergency 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 during the acute phase of this emergency. Machete and knife wounds, as well as blunt-force injuries, are responsible for a variety of open and closed wounds. Appropriate medical and surgical treatment of these injuries is vital to improve survival, minimize future functional impairment and disability and ensure 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 injury 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. See section 4 of this document, **Wounds and injuries**, *WHO Integrated Management for Emergency and Essential Surgical Care toolkit*.
- 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, typhoid, dengue and DHF, hepatitis, leishmaniasis, measles, malaria, and meningitis) and STIs.
- Standard **infection control practices** in accordance with national protocols should also be in place.
- The national treatment guidelines for **malaria** is as follows:
  - For uncomplicated cases:
    - not laboratory-confirmed: **artemether–lumefantrine**;
    - laboratory-confirmed falciparum malaria: **artemether–lumefantrine**;
  - For severe cases: **Quinine x 7 days**.
  - For pregnant women: **Quinine x 7days or artemether-lumefantrine** during 2nd and 3rd trimesters.

- Continued provision of anti-**TB** treatment must be ensured for TB patients who have previously been receiving treatment. Their treatment must not be interrupted and should be provided in line with the directives of the 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 to provide a rapid response to alerts. Rapid detection of cases of epidemic-prone diseases is essential to ensure rapid control. The early warning and response system should:

- 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. Where present, existing Integrated Disease Surveillance and Response (IDSR) case definitions and reporting protocols should be utilized.
- 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 and material 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**, is an immediate priority health intervention (at least 20% of children are vitamin A deficient). All children aged 6 months to 15 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 suspected measles case is sufficient to prompt the immediate implementation of activities to control measles.
- 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.

- Mass **tetanus vaccination** programmes to prevent disease are not indicated. Tetanus boosters may be indicated for previously vaccinated people who sustain wounds or other lacerations 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 by the recently published WHO risk assessment tool (see section 4 of this document, **Diarrhoeal diseases**). Current recommendations state that OCV should not be used once an outbreak has started or if basic public health priorities are not covered.
- 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 in malaria-endemic areas (one net per two people), with highest priority being 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 Kenya, it may not be possible to implement all of the following recommendations. More detailed practical advice is available in section 4: Diarrhoeal diseases, *Guidelines for Control of Shigellosis*.

#### 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 single cup, or other utensil with a handle, 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).
- 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.
- 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 ensure that people with symptoms of disease are kept 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, 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 of diarrhoea (within 24 hours of onset).
- Diagnosis and treatment of high or prolonged fever.
- 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 Africa (AFRO) guidelines

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

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

Communicable Disease Prevention and Control, WHO/AFRO

<http://www.afro.who.int/ddc/index.html>

Health Action in Crises (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://www.searo.who.int/LinkFiles/Dengue\\_Guideline-dengue.pdf](http://www.searo.who.int/LinkFiles/Dengue_Guideline-dengue.pdf)

Dengue haemorrhagic fever: early recognition, diagnosis and hospital management: an audiovisual guide for health-care workers responding to outbreaks

<http://terrace.who.int:85/streaming/dhf.wmv>

### Diarrhoeal diseases

Acute diarrhoeal diseases in complex emergencies: critical steps

[http://www.who.int/cholera/publications/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/](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/](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/](http://www.who.int/water_sanitation_health/hygiene/emergencies/en/)

### Food safety

5 keys to Safer Food

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

Foodborne disease outbreaks: Guidelines for investigation and control

[http://www.who.int/foodsafety/publications/foodborne\\_disease/fdbmanual/en/index.html](http://www.who.int/foodsafety/publications/foodborne_disease/fdbmanual/en/index.html)

### 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](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/](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/](http://www.who.int/3by5/publications/documents/iasc/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](http://www.who.int/nutrition/publications/guide_inpatient_text.pdf)

Community-based management of severe malnutrition in children

[http://www.who.int/nutrition/topics/comm\\_based\\_malnutrition/en/index.html](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](http://www.who.int/child-adolescent-health/publications/referral_care/homepage.htm)

Training Course on the Management of Severe Malnutrition

[http://www.who.int/entity/nutrition/publications/en/manage\\_severe\\_malnutrition\\_training\\_fly\\_en\\_g.pdf](http://www.who.int/entity/nutrition/publications/en/manage_severe_malnutrition_training_fly_en_g.pdf)

Guiding principles for feeding infants and young children during emergencies

[http://www.who.int/nutrition/publications/guiding\\_principles\\_feedchildren\\_emergencies.pdf](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](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/view.aspx?resid=6>

WHO Policy: Ensuring optimal feeding of infants and young children in emergencies

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

### **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 after disasters: a field manual for first responders

<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](http://www.unicef.org/publications/index_19531.html)

**Medical waste in emergencies**

[http://www.who.int/water\\_sanitation\\_health/medicalwaste/emergmedwaste/en/](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](http://www.who.int/mental_health/resources/emergencies/en/index.html)  
IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings  
<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/](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](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](http://whqlibdoc.who.int/hq/2006/WHO_CDS_NTD_DCE_2006.2_eng.pdf)

**Polio**

[http://www.who.int/immunization\\_monitoring/diseases/poliomyelitis\\_surveillance/en/index.html](http://www.who.int/immunization_monitoring/diseases/poliomyelitis_surveillance/en/index.html)

**Travel advice**

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

**Tuberculosis**

<http://www.moh.gov.np/programmes/Tb.asp>  
Tuberculosis care and control in refugee and displaced populations  
[http://whqlibdoc.who.int/publications/2007/9789241595421\\_eng.pdf](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\\_WHOPES\\_GCDPP\\_2006.1\\_eng.pdf](http://whqlibdoc.who.int/hq/2006/WHO_CDS_NTD_WHOPES_GCDPP_2006.1_eng.pdf)

**Wounds and Injuries**

Integrated management for emergency and essential surgical care toolkit

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

Best practice guidelines on emergency surgical care in disaster situations

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