Public Health Risk Assessment and Interventions

Flooding disaster: Nigeria

1 November 2012
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ACKNOWLEDGEMENTS

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PREFACE

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

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.

Public health threats, and in particular, the prevention and control of communicable diseases, represents a significant challenge to those providing healthcare services in this evolving situation. It is hoped that this technical note will facilitate the coordination of activities between all agencies working among the populations currently affected by the crisis.
1. BACKGROUND AND RISK FACTORS

Nigeria is the most populous country in Africa with a population of 153,360,912. It is located within the tropics along the Gulf of Guinea on the west coast of Africa. It is bordered to the west by the Republic of Benin, to the east by the Republic of Cameroon, to the north by Republic of Niger and the Atlantic Ocean and Gulf of Guinea to the south. The country has two major types of climate which divide the country into mangrove swamps and rain forest in the south, savannah region in the middle belt and desert in the far north. The rainy and dry seasons span from April-September and October-March respectively.

Torrential rains in recent weeks have caused flash floods in many areas of West Africa and the Sahel region. In Nigeria, this has been the worst flooding in 50 years. It has left at least 431 people dead and over one million displaced (1.4 million according to UN-OCHA). The Federal Capital Territory and 35 out of 37 States have been affected. Of the 35 States affected, 14 have suffered severe damage including destruction of bridges and civil infrastructure, health facilities and homes. There are 550,000 damaged houses (UN-OCHA) and many families have relocated into makeshift camps, schools or with host families. The rainy season is not yet over, and the recent, forced release of additional dams and reservoirs has increased the extent and impact of these floods.

The flooding has affected highly vulnerable, rural communities heavily reliant on subsistence agriculture. Basic services are already severely overstretched. Many communities have been totally isolated by the floodwaters.

Water and sanitation facilities have also been severely impacted by the flooding. In the best of times, only about 50% of the population have access to potable water and appropriate sanitation. Water supplies in urban areas include piped water supplemented by boreholes dug by private individuals. In the rural areas, sources of water include hand pumps and boreholes and most residents get their drinking water from streams. A large percentage of these water sources are likely to have been damaged or contaminated.

In response to the flooding, the Federal Government of Nigeria has declared an emergency and asked the international community for assistance in order to effectively respond to the disaster, including the mobilization of additional resources. A rapid needs assessment is underway by the Humanitarian Country Team (HCT), of which WHO is a member, in 14 of the worst-affected states. Response to the crisis is being coordinated by the National Emergency Management Agency (NEMA). A National Emergency Task Force has been set up to coordinate the health response and interact with NEMA. WHO is participating and supporting the Taskforce. The Nigerian Red Cross, local health authorities and a few other NGOs are the main providers of health services.

Before the floods hit, most of the affected regions were facing a food crisis. Extended periods of under-nutrition and malnutrition due to the food crisis, combined with displacement, poor shelter, overcrowding and lack of access to safe water and sanitation, have rendered people vulnerable to disease.

Flooding can damage or cause the overflow of sanitation facilities and increase the risk of contamination of water sources. This facilitates the spread of diarrhoeal diseases such as cholera. It can also enhance mosquito breeding and increase vector-borne diseases such as malaria. The loss of shelter and exposure will also increase the risk of pneumonia and related deaths, especially in children under five years of age.
2. IMMEDIATE PUBLIC HEALTH RISKS

The main public health threats in this flooding crisis are related to communicable diseases, related to risk factors listed below. Basic preventive and curative health services have also been disrupted, weakening access to appropriate health care.

1. **Interruption of safe water and sanitation supplies.** The populations displaced by flooding are at immediate and high risk of outbreaks of **waterborne and foodborne diseases**, such as **cholera**.

2. **Population displacement with overcrowding.** Populations in the affected areas have been displaced into schools, camps or with host families, and are at immediate and high risk for transmission of **measles** and **meningitis** and increased incidence of **acute respiratory infections (ARI)**, especially **pneumonia** in children under 5 years.

3. **Vector breeding.** Flooding can result in the proliferation of vector breeding sites, increasing the medium-term (weeks to months) risk of **malaria** and yellow fever.

4. **Poor access to health services** is of immediate concern, as the health infrastructure has been destroyed or overwhelmed, drugs and supplies damaged and health-care workers also displaced.

5. **Malnutrition and transmission of communicable diseases.** Malnutrition compromises natural immunity, leading to more frequent, severe and prolonged episodes of infections. Severe malnutrition often masks symptoms and signs of communicable diseases, making prompt clinical diagnosis and early treatment more difficult.

2.1 Waterborne and foodborne diseases

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

Cholera is endemic in Nigeria and transmission was documented before the current flooding. Between 1 January and 23 October 2011, over 22,000 cases of cholera and more than 700 deaths were reported to WHO. Since the onset of the rains, cases of diarrhoea and dysentery, including deaths, have been reported from the flood-affected areas, and the immediate risk of further cases will remain extremely high.

**Leptospirosis** is freshwater-borne and is associated with flooding and the crowding of rodents whose infected urine can contaminate humans through contaminated food, water or dirtied hands.

2.2 Vector-borne and zoonotic diseases

*Plasmodium falciparum* **malaria** is endemic in the flood-affected areas of Nigeria. These areas experience seasonal epidemics and populations will be at increased risk given the proliferation of vector breeding sites secondary to flooding. Rapid needs assessments are on-going. Specific malaria case management information can be found in Section 3.
**Arbovirus yellow fever**: Yellow fever is spread by bites from Aedes aegypti mosquitoes and is endemic in Nigeria. Because of the low routine vaccination coverage, most of the population has low immunity. Risk of transmission is increased among people living in inadequate shelters and/or overcrowded conditions along with poor sanitary conditions. The risk is also increased where water is stored in unprotected water containers and rainfall collects in other artificial containers such as metal cans, old tires, or derelict vehicles, allowing mosquito vectors to proliferate.

A mass vaccination campaign is key in limiting the spread of yellow fever in case of an outbreak. Global vaccine stockpiles for emergency situations are available. In the event of an outbreak, a request should be sent to the International Coordination Group (ICG) on vaccine provision. The request should be supported by a laboratory confirmed case, an analysis of the epidemiological situation, pre-existing stocks at country level, a planned interventions strategy and an operational aspect of the outbreak response.

**Dengue** is highly under recognized and under reported in Africa, where most febrile illnesses are not laboratory-confirmed and are assumed to be malaria. Nigeria has recorded dengue infections from 1964 to 1968 and serological studies have continued to confirm its presence in 2011. Aedes aegypti, the principal vector of dengue, is widely prevalent in the country. If conditions are favourable (mostly 6-8 weeks after the floods), the density of the vector could increase dramatically in urban centres and favour the transmission of dengue virus. Water supply and storage of safe water practices should also be put in place to prevent vector breeding in water storage containers. Discarded tires and other water holding containers could further facilitate vector breeding.

**2.3 Diseases associated with crowding**

Population displacement caused by flooding can result in crowding in resettlement areas, raising the risk of transmission of certain communicable diseases. **Measles** (see vaccine-preventable diseases), **ARI and meningococcal disease** are transmitted from person to person, and risk is increased in situations of forced relocation to shared areas of high ground, often with inadequate shelter. Crowding can also increase the likelihood of transmission of waterborne and vector-borne diseases.

**2.4 Vaccine-preventable diseases and routine immunization coverage**

National **measles** vaccination coverage is sub-optimal to prevent transmission among the population of the affected areas. Since 1 January 2012, 3463 (as of October 2012) measles cases have been reported in Nigeria.

**Polio** is endemic in Nigeria, since 1 January 2012, 97 polio cases have been reported as of October 2012; an increase of 36% compared to the same time last year. Immunization Plus Days (IPDs) were conducted in 11 high-risk states in the north of the country from 6-9 October 2012.

Inadequate **tetanus** vaccination coverage (74%) also increases the likelihood of morbidity and mortality from tetanus. **Injuries** are likely to be a risk factor for increased transmission of tetanus.

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

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1 http://www.polioeradication.org/Dataandmonitoring/Poliothisweek.aspx

Table 1. Routine vaccination coverage, 2011, Nigeria

<table>
<thead>
<tr>
<th>Antigen</th>
<th>% coverage*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacille Calmette–Guérin (BCG)</td>
<td>64</td>
</tr>
<tr>
<td>Diphtheria–pertussis–tetanus, 3rd dose (DPT3)</td>
<td>47</td>
</tr>
<tr>
<td>Hepatitis B, 3rd dose (HepB3)</td>
<td>50</td>
</tr>
<tr>
<td>Measles-containing vaccine (MCV)</td>
<td>71</td>
</tr>
<tr>
<td>Polio, 3rd dose (OPV3)</td>
<td>73</td>
</tr>
</tbody>
</table>


2.5 Other communicable diseases

When an emergency develops, people may be subjected to situations that substantially increase their risk of contracting sexually transmitted infection, including human immunodeficiency virus (HIV). Risk factors include massive displacement of people from their homes; women and children left to fend for themselves; social services overwhelmed or destroyed; and a lack of means to prevent HIV infection, such as clean needles, safe blood transfusions and availability of condoms. Nigeria has a generalized HIV epidemic. Population mobility within the affected areas may increase the risk of exposure to HIV. This risk may increase as much of the flood-affected area is itself a border zone.

The overall prevalence rate in the population is estimated to be 4%, with 3.1 million people living with the virus. As of 2011, 852,846 were receiving antiretroviral therapy (ART). The emergency response should ensure a minimum package of HIV prevention, treatment and care services, including the strengthening of standard precautions, with the provision of gloves, sterile needles and syringes and safe waste disposal management in health services. Additional services should include the 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 both to ensure that HIV/AIDS patients receiving ART do not have their treatment interrupted and to provide ART for the prevention of HIV transmission from known-infected mothers.

Transmission of tuberculosis (TB) may also increase. The main problem is the interruption of anti-TB treatment provision to patients already undergoing treatment; it is therefore important to ensure uninterrupted access to treatment for these patients during the acute phase of an emergency. The various issues that need to be considered in this acute phase are developed in Appendix 11 of the TB guideline in Part 4. Other aspects of TB control can be addressed once emergency and basic health care have been re-established. Nigeria has a well-structured national TB programme (NTP) and has implemented appropriate TB care and control services. TB control activities that will be developed must be carried out in collaboration with the NTP of Nigeria and in line with its policy to control TB.

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2 http://apps.who.int/immunization_monitoring/en/globalsummary/timeseries/tswucoveragedtp3.htm;
3 http://naca.gov.ng/content/view/417/lang,en/
Table 2. Summary of risk of communicable diseases in flood-affected populations

<table>
<thead>
<tr>
<th>Communicable disease</th>
<th>Of immediate concern following floods</th>
<th>Of concern in weeks to months following floods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholera/Typhoid/Shigellosis</td>
<td>+++</td>
<td></td>
</tr>
<tr>
<td>Acute lower respiratory tract infections</td>
<td>+++</td>
<td></td>
</tr>
<tr>
<td>Hepatitis A &amp; E</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>Leptospirosis</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>Measles</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>Malaria</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Dengue fever</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Meningitis</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Poliomyelitis</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>++</td>
<td>++</td>
</tr>
</tbody>
</table>

**Key:**  - = Unknown  0 = No risk  + = low risk  ++ = moderate risk  +++ = high risk

2.6 Other public health risks

**Injuries and disabilities**
Management of injuries sustained in the disaster may be complicated by greater delays in presenting for care and limited access of skilled personnel to the affected areas. Surgical needs for injuries are crucial both for urgent and for non-urgent conditions to save lives and prevent future disability. Wound management should also include tetanus prophylaxis with vaccine and toxoid.

**Snakebites**
There is an increased risk of snakebite as venomous snakes will be washed from their normal habitats and carried in flood waters into new areas. Since both people and snakes will seek drier ground there is a greater chance of contact.

**Mental health disorders and psychosocial problems**
Many people in the affected population are likely to be burdened by a wide range of symptoms of distress caused by continuing danger, loss, trauma, and changed or uncertain social conditions. It is important for health services to differentiate between normal psychological distress and moderate or severe mental disorders. Normal psychological distress may be reduced through psychological first aid and other non-clinical psychosocial interventions. However, moderate or severe mental disorders require clinical treatment in addition to psychosocial support. Continued access to care should be assured for people with severe mental disorders.

**Malnutrition**
Early this year (in 2012), a high level of global acute malnutrition (wasting and bilateral oedema) was observed in seven states in northern Nigeria namely Sokoto, Katsina, Jigawa, Yobe, Zamfara, Kebbi and Kano (which are also affected by flood). The combined population of these states is 38 576 735 (projected from the 2006 Census), 20% (7 715 347) of which is estimated to be the
population of children under-five. A recent cross-sectional nutrition survey in Northern Nigeria (FGN & UNICEF, July/August 2011) showed that four out of the seven states, namely Katsina, Sokoto, Jigawa and Yobe reported global acute malnutrition of above 10%. Above 40% of under-five children were found to be chronically malnourished (stunted). These findings are fairly consistent with the Nigeria Demographic Health Survey (NDHS 2008) report of 41% stunting and 14% wasting among under-fives in the country. Data for both surveys were based on the WHO Child Growth standards adopted in 2006.

Additionally, data from all seven states showed that the onset and peak of malnutrition is within the first 24 months of life, and the highest levels of malnutrition using MUAC, BMI and stunting among women of reproductive age is among adolescents (age 15-19) as compared to older women.

If the crisis is prolonged and there is a lack of access to appropriate and adequate food, including complementary foods, risk of malnutrition could increase for vulnerable groups such as young children, pregnant and lactating women and older persons. The risk is also likely to increase if there is a lack of, or inadequate support for, mothers or caretakers to exclusively breastfeed for six months and to continue breastfeeding up to two years, with appropriate and safe complementary feeding. In 2012, only 13% of infants were exclusively breastfed for the first six months of life (2006-2010, source UNICEF Report 2012).

Donations of infant formula and other breast-milk substitutes should be avoided because it can increase morbidity and mortality in infants and young children. Targeting, use, procurement, management and distribution of these products should be strictly controlled, should be based on technical advice, and should comply with the Operational Guidance on Infant feeding in Emergencies (2007).

Building the capacity of health workers at all levels (PHC and hospitals) to provide appropriate medical and nutritional care for cases with severe acute malnutrition will also be essential. This would include the continuous provision of kits for the management of severe malnutrition and training of health care providers, along with the provision of adequate supplies, equipment and medicines.

**Environmental risks**

There is a high degree of lead contamination in soil in parts of Zamfara State as a result of gold ore processing within communities. Flooding may re-contaminate remediated areas as well as transferring lead to new areas. Once the waters have receded, consideration should be given to the need to (re)assess the level of lead contamination so that appropriate measures can be taken. Flood waters affecting areas where there are waste dumps, chemical or pesticide stores or industrial installations may become contaminated with chemicals. The degree of hazard will depend on the chemicals concerned and their concentration in the water. Water around such sites should not be used for washing, cooking or drinking.

Petrol and diesel fuelled generators produce highly toxic carbon monoxide gas if used in enclosed spaces with inadequate ventilation (e.g. inside tents). It is important to ensure that while such equipment is running, there is a good air supply (e.g. by opening windows, vents etc.).

**Reproductive health**

Maternal, neonatal, infant and child mortality are already high [maternal mortality: 545/100 000 live births; neonatal mortality 40/1000 live births; infant mortality 75/1000 live births and under-5 child mortality rate 88/1000 live births (NDHSS 2008) ] and disruption in primary and secondary health services in the affected areas could increase morbidity and mortality.
During a crisis, some aspects of maternal and newborn health must be addressed at the initial phase to reduce mortality and morbidity among pregnant women and newborn infants. Issues of concern include complications related to pregnancy, delivery and postpartum, other conditions which can complicate pregnancy and childbirth such as malaria and anaemia, as well as health problems in the newborn.

In addition, pregnant women in the affected population are delivering in unsafe environments without skilled attendants, with inadequate referral systems and poor access to emergency obstetric care.
3. **PRIORITIZATION INTERVENTIONS**

I. **Health sector priorities**

- Multisectoral assessments to identify needs, gaps and priorities.
- Restore access to basic and secondary health care services including provision of temporary mobile health services with relevant medicines and supplies to increase access to care.
- Ensure appropriate triage and referral systems for emergency medical, surgical and obstetric care.
- Resume vaccination services as soon as possible and consider mass measles vaccination in crowded settings/camps.
- Ensure vector control and preventive measures to reduce the risk of vector-borne diseases among the displaced populations, where required.
- Prevent disease outbreaks and ensure capacity for early detection and rapid response to public health emergencies by strengthening EWARN and ensuring outbreak preparedness and prepositioning.
- Support adequate maternal and newborn health services, ensuring privacy and cultural sensitivity, with registration in camps, early detection of and referral for complications of pregnancy and childbirth, safe delivery, and provision of relevant commodities.
- Support appropriate infant and young child feeding, supplementation for pregnant and lactating mothers, and management of malnutrition, including building health worker capacity and supporting referral and hospital care for management of severe malnutrition.
- Intensify community social mobilization including health risk communication to promote safe water, sanitation and hygiene practices.
- Assess the early recovery needs of the affected population and prioritize recovery interventions.

II. **Non-health sector priorities impacting health**

- Ensure adequately sized and ventilated shelter.
- Provide sufficient and safe water.
- Provide adequate sanitation and hygiene facilities.
- Provide blankets and non-food items in camps.
- Provide safe food, including complementary food for children less than two years of age.
4. RELEVANT PUBLICATIONS

WHO headquarters/WHO Regional Office for Africa (AFRO) guidelines
Disease control in humanitarian emergencies, WHO/HQ
   http://www.who.int/diseasecontrol_emergencies/en/
Communicable Disease Surveillance and Response, WHO/AFRO
Emergency Risk Management and Humanitarian Response department (ERM), WHO/HQ
   http://www.who.int/hac/en/

Child health in emergencies

Chemicals information
International Chemical Safety Cards
   http://www.ilo.org/dyn/icsc/showcard.home
INCHEM databank:
   www.inchem.org

Dengue
Dengue guidelines, for diagnosis, treatment, prevention and control:

Diarrhoeal diseases
Acute diarrhoeal diseases in complex emergencies: critical steps:
Cholera outbreak: assessing the outbreak response and improving preparedness:
First steps for managing an outbreak of acute diarrhoea:
Guidelines for the control of shigellosis, including epidemics due to *Shigella dysenteriae* type 1:
   http://www.who.int/topics/cholera/publications/shigellosis/

Environmental health in emergencies
   http://www.who.int/water_sanitation_health/hygiene/emergencies/en/

Food safety
Ensuring food safety in the aftermath of natural disasters
   http://www.searo.who.int/en/section23/section1108/section1835/section1864_8326.htm
   http://www.who.int/foodsafety/consumer/5keys/en/

Hepatitis A

Hepatitis E
   http://www.who.int/mediacentre/factsheets/fs280/en/
HIV/AIDS
HIV/AIDS interventions in emergency settings: Interagency Standing Committee guidelines

Injuries and Emergency Surgical care
Integrated Management of Emergency and Essential Surgical Care (IMEESC) tool kit

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

Leishmaniasis
http://www.who.int/leishmaniasis/en/

Malaria
http://www.who.int/malaria/epidemics_emergencies/en/

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
Training Course on the Management of Severe Malnutrition
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

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

Maternal and Newborn Health /Sexual and Reproductive Health
Minimum initial service package for reproductive health in crisis situations
http://misr.rhrc.org/
Inter-agency field manual on reproductive health in humanitarian settings 2010 revision for field review

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/

Mental health in emergencies
Inter Agency Standing Committee (IASC) guidance is on mental health in emergencies – English
Inter Agency Standing Committee (IASC) guidance is on mental health in emergencies – French

Meningitis
Managing meningitis epidemics in Africa: A quick reference guide for health authorities and health-care workers
http://www.who.int/docstore/wer/75_27_52.html
Control of epidemic meningococcal disease. WHO practical guidelines

Laboratory specimen collection

Pandemic influenza preparedness and mitigation in refugee and displaced populations
http://whqlibdoc.who.int/hq/2006/WHO_CDS_NTD_DCE_2006.2_eng.pdf

Snakebite
Guidelines for the Prevention and Clinical Management of Snakebite in Africa
Global database of venomous snake distribution and antivenom
http://apps.who.int/bloodproducts/snakeantivenoms/database

Travel advice
http://www.who.int/ith/en/

Tuberculosis
Tuberculosis care and control in refugee and displaced populations – an interagency field manual
http://www.who.int/topics/tuberculosis/en/

Vaccines and biologicals for emergencies

Vector control
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 an 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 purpural 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 or positive PCR test

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.