PLAGUE	
	Antibiotic treatment should be initiated before culture results are obtained. Plague patients seroconvert to the F1 *Y. pestis* antigen 7-10 days after onset.

Reference

- Plague Manual: Epidemiology, Distribution, Surveillance and Control/ Manuel de la Peste: Epidémiologie, Répartition, Surveillance et Lutte. WHO/CDS/CSR/EDC/99.2
- "Laboratory Manual of Plague Diagnostic tests." CDC/WHO publication, 2000, Atlanta, GA

POLIOMYELITIS (ACUTE FLACCID PARALYSIS)

Background

- Poliomyelitis is a paralytic disease caused by wild Poliovirus serotypes 1, 2, or 3. It istransmitted fromperson-to-person via faecal-oral route.
- Incubation period is 7 to 14 days for paralytic cases and the range is approximately 3 to 35 days. Thevirus may be shed for several years by immuno-compromised persons.
- Infection is usually asymptomatic, but may cause a febrile syndrome with or without meningitis. In less than 1% of infections there is an onset of an acute Acute Flaccid paralysis (AFP) that mostly affects the limbs.
- Polio infection occurs almost exclusively among children. Infection may occur with any of the 3 serotypes of Poliovirus. Immunity is serotype-specific and lifelong.
- Paralytic polio, though not fatal, has devastating social and economic consequences among affectedindividuals.
- The Polio Eradication Program has nearly halted ongoing wild-type polio transmission worldwide through use of oral poliovirus (OPV) vaccine. Globally, poliomyelitis caused by poliovirus type 2 has not been reported since 1999 and appears to have been eliminated. Serotypes 1 and 3 polioviruses still circulate in several African countries and surveillance is not yet adequate to assure eradication inmany countries.
- Areas with low vaccine coverage may allow ongoing wild-type transmission.
- Other neurological illnesses may present with similar signs and symptoms as poliomyelitis and may cause Acute Flaccid Paralysis, for example, Guillain-Barré syndrome and transverse myelitis.

Surveillance goal

- Detect cases of acute flaccid paralysis (AFP) and obtain laboratory confirmation of the etiology of allsuspected AFP cases.
- Timely case investigation (within 14 days of onset) of all AFP cases. Stool can be collected up to 30 days from the date of onset.
- Immediate case-based reporting of all AFP cases. Weekly summary reporting of cases for routine surveillance and outbreaks.
- Surveillance for AFP is used to capture all true cases of paralytic poliomyelitis. Target for surveillance performance to provide certification of polio eradications is 4 cases of AFP per year per 100 000 population aged less than 15 years (New surveillance performance target since 2011).

Standard case definition

Suspected case: Any child under 15 years of age with acute flaccid paralysis (not due to trauma) or anyperson with paralytic illness at any age in whom the clinician suspects poliomyelitis.

Confirmed case: A suspected case with virus isolation in stool.

Respond to alert threshold

If a single case is suspected:

- Report the suspected case immediately according to the national polio eradication program

guidelines.
- Conduct a case-based investigation. Include a vaccination history for the patient.
- Collect two stool specimens. Collect the first one when the case is investigated. Collect the second one from the same patient 24 to 48 hours later. See laboratory guidelines for information on how toprepare, store and transport the specimen.
- Obtain virological data from reference laboratory to confirm wild-type poliomyelitis or Vaccine derived poliomyelitis

Respond to action threshold

If a case is confirmed:
- Specimens from contacts with advice from DDSR
- If wild polio virus is isolated from stool specimen, refer to national polio eradication program guidelines for recommended response actions. The national level will decide which actions to take. They may include the following:
  - Immediately conduct "mop-up" vaccination campaign around the vicinity of the case.
  - Conduct active case search
  - Conduct surveys to identify areas of low OPV coverage during routine EPI activities, and improveroutine vaccine coverage of OPV and other EPI antigens.
  - Specify reasons for non-vaccination of each unvaccinated case and address the identified deficiencies.
  - Plan for supplemental vaccination campaigns during National Immunization Days (NIDs) or Sub-National Immunization Days (SNIDs). Focus supplemental vaccination activities in areas of low vaccine coverage during EPI. Consider use of house-to-house vaccination teams in selected areas.

Analyze and interpret data

Time: Graph monthly cases (which should be zero to very few cases per area per year), or weekly casesduring an outbreak. Evaluate the percent of suspected cases reported within 48 hours and the percentagewith adequate laboratory evaluation.

Place: Plot location of case households. Investigate the circumstances of poliovirus transmission in eachcase thoroughly. Examine the possibility of other potential areas of transmission.

Person: Count monthly routine and outbreak-related cases. Analyze age distribution. Assess risk factorsfor low vaccine coverage.

Laboratory confirmation

Diagnostic test	Isolation of polio virus from stool
Specimen	Stool ***Note:*** *If no specimen is collected, re-evaluate patient after 60 days to confirmclinical diagnosis of polio (AFP).*
When to collect the specimen	▪ Collect a sample from every suspected AFP case. ▪ Collect the first specimen when the case is investigated. ▪ Collect a second specimen on the same patient 24 to 48 hours later.
How to prepare, store, and transport the specimen	▪ Place stool in clean, leak-proof container and label clearly. ▪ Immediately place in refrigerator or cold box not used for storing vaccines or other medicines. ▪ Transport specimens under reverse cold chain to arrive at KEMRI polio laboratory within 72 hours of collection ▪ When there is a delay, and specimen will not be transported within 72 hours, freeze specimen at -20□C or colder. Then transport frozen specimen with dry ice or cold packs also frozen at -20□C or colder.
Results	Confirmed results are usually available within 21 after receipt of specimen by thelaboratory.

POLIOMYELITIS (ACUTE FLACCID PARALYSIS)

	If wild or vaccine derived polio virus is detected, DDSR will plan appropriate response actions

Reference

- *Field Guide for Supplementary Activities Aimed at Achieving Polio Eradication*. World Health Organization.
- WHO global action plan for laboratory containment of wild polio viruses. WHO/V&B/99.32, Geneva, 1999
- Manual for the virological investigation of polio,WHO/ EPI/GEN/97.01, Geneva, 2004
- Supplement to the Manual for the virological investigation of Polio- WHO/EPI 2007

RABIES AND ANIMAL BITES (DOGS)

Background

- Rabies is a zoonotic disease that is caused by a virus. Rabies infects domestic and wild animals, and isspread to people through close contact with infected saliva (via bites or scratches).
- The rabies virus infects the central nervous system, causing disease in the brain and, eventually, death. Early symptoms in people include: fever, headache, and general weakness or discomfort. Asthe disease progresses, symptoms include; insomnia, anxiety, confusion, slight or partial paralysis, excitation, hallucinations, increase in saliva, difficulty swallowing, and fear of water.
- In unvaccinated humans, rabies is almost always fatal if post-exposure prophylaxis is not administered before the onset of severe symptoms. Death usually occurs within days of the onset ofneurological symptoms.
- Dogs are the main carrier of rabies in Africa and are responsible for most (approximately 97%) of the human rabies deaths worldwide.
- WHO estimates approximately 55,000 human deaths worldwide due to rabies each year; in Africa the annual death toll is 24,000.
- People most at-risk of rabies live in rural areas, and children are at highest risk of dog rabies. About30% to 60% of the victims of dog bites (the primary mode of virus transmission) are children less than 15 years of age. Children often play with animals and are less likely to report bites or scratches.
- Control of rabies in dog populations and access to persons to post exposure prophylaxis can substantially reduce the burden of rabies in human populations
- Rapid and accurate laboratory diagnosis of rabies in humans and other animals is essential for timely administration of post-exposure prophylaxis. Within a few hours, a diagnostic laboratory can determine whether or not an animal is rabid and inform the responsible medical personnel.

Surveillance goal

- Detect and respond promptly and appropriately to cases and outbreaks of rabies do you want torespond to rabies or bites from suspected animals?.
- Identify high-risk areas
- Estimation of disease burden
- Immediate reporting of cases and routine monthly summary reports

Standard case definition

Suspected: A person reporting to a health facility with a history of having been bitten or been in contactwith saliva of an animal that is suspected to be rabid.

Probable: A person with one or more of the following: headache, neck pain, nausea, fever, fear of

water, anxiety, agitation, abnormal tingling sensations or pain at the wound site, when contact with a rabid animal is suspected.

Confirmed: A suspected case that is laboratory confirmed

Recommended Public Health Action

For a single case:

- Administer hyper-immune serum
- Post exposure prophylaxis to prevent rabies in **Suspected case**
- Vaccinate local dogs and cats to prevent outbreaks in liason with DVS---------- grammar

General preventive measures:

- Promote public awareness on rabies
- Target immunization campaign for domestic or wild animals in high-risk areas in liason with DVS
- Maintain active surveillance of rabies in animals in liason with DVS

Analyze and interpret data

Time: Plot cases monthly.

Place: Plot the location of case households and animal exposures.

Person: Analyze distribution of cases by age, exposing animal, and circumstances of infection. Assess riskfactors to improve control of cases

Laboratory confirmation

Diagnostic test	Detection of rabies viral antigens by direct fluorescent antibody (FA) in clinicalspecimens, preferably brain tissue (collected post mortem) ▪ Detection by FA on skin or corneal smear (collected ante mortem) ▪ FA positive after inoculation or brain tissue, saliva or CSF in cell culture, in miceor in suckling mice ▪ Detectable rabies-neutralizing antibody titre in the CSF of an unvaccinated person ▪ Identification of viral antigens by PCR on fixed tissue collected post motern or ina clinical specimen (brain tissue or skin, cornea or saliva) ▪ Isolation of rabies virus from clinical specimens and confirmation of rabies viralantigens by direct fluorescent antibody testing.
Specimen	▪ Brain tissue (collected post mortem) for both animals and humans ▪ Human skin biopsy (usually from the nape) ▪ Human cornea scripping ▪ Human or animal saliva ▪ Human CSF ▪ Head of suspected rabid animal (dogs)
When to collect the specimen	When a person is bitten by a pet that appears sick or by a wild animal, the biggest concern is rabies. No test can determine whether the rabies virus has beentransmitted to the person immediately after the bite. So the animal is evaluated to determine whether the person requires treatment. A wild animal that has bitten a person is killed if possible, so that its brain can be examined. If a person who has been bitten by an animal becomes increasingly confused and agitated or paralyzed, the diagnosis is probably rabies. At this point, tests can detect the rabies virus. Post mortem within 4-6hrs after death of patient, as soon as the suspected animal diesor is killed

RABIES AND ANIMAL BITES (DOGS)

How to prepare, store, and transport the specimen	Safety precautions in handling rabies virus should be taken to avoid infection. Remove the head of the suspected animal, wrap head completely such that no bloodis oozing out. Where possible, request a veterinarian to assist in the collection and preservation of the specimen. Sample should be sent to Reference Lab for Rabies virus identification.
Results	The treatment should never await the results of laboratory diagnosis. A laboratory diagnosis may be delayed for a variety of reasons. Results can be obtained from thereference lab within 1-2days.

Reference

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- Laboratory techniques in rabies, Fourth Edition, WHO, edited by F.-X. Meslin and all
- World Health Organization, Rabies Fact Sheet http://www.who.int/mediacentre/factsheets/fs099/en/
- Council of State and Territorial Epidemiologists (CSTE). National Surveillance for Human Rabies. CSTE position statement 09-ID-70. Atlanta: CSTE; June 2009. Available from: http://www.cste.org.
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RADIATION EXPOSURE

Background

- An accident is called a nuclear accident when it involves a nuclear facility, especially a nuclear reactor.
- A radiological accident involves a sealed or unsealed radiation source and leads to an uncontrolled release of ionizing radiation or radioactive materials into the environment.
- Such radiation sources include X ray equipment, sealed radioactive isotope sources (such as Cobalt-60, Cesium-137 or Iridium-192 irradiators) used mostly in medicine and industry, and unsealed sources used in nuclear medicine and scientific research.
- Potential accident types include the following:
  - A radioactive source may be misplaced, lost or stolen. An obvious example might be a gamma radiography source container and source found to be missing. One problem here is that the container may come into the possession of people who decide to dismantle or otherwise interfere with it, thereby exposing themselves and possibly others to an unshielded source.
  - A radioactive source may become unshielded as the result of a failure during routine operations.Again, gamma radiography provides an example: after making an exposure an operator may find it impossible to retract the source into its container.
  - A radioactive material may be dispersed. For example, a vial containing a radioactive solution might develop a leak during storage. Another example would be a violent release of radioactivesubstances from a radiochemical facility.
- In all these cases, there is a possibility of uncontrolled exposure of persons unless appropriate protective measures are taken.

RADIATION EXPOSURE

Surveillance goal

- To prevent accidents
- To prevent deterministic health effects (e.g. early deaths and injuries) by taking actions before or shortly after exposure and by keeping the public and emergency worker individual doses below the thresholds for deterministic health effects.
- To reduce the risk of stochastic health effects (e.g. cancer and severe hereditary effects) as much asreasonably achievable by implementing protective actions in accordance with International Atomic Energy Agency (IAEA) guidance

Standard case definition

Suspected case: Any person with burns of no known etiology or is suspicions about handling an 'object'that may be causing him to feel unwell

Confirmed cases: A suspected case with laboratory confirmation.

Respond to alert threshold

If an accident is suspected

- Prevent inadvertent ingestion of contamination (e.g., wear gloves, do not smoke or eat).
- Perform life saving measures and provide first aid for serious injuries immediately, before conducting radiological monitoring.
  - Keep people away from any potential source of exposure (at least 10 m from the public).
  - Arrange to transport seriously injured people to local medical facility. If they may becontaminated,
  - Wrap them in a blanket to control the spread of contamination. Tell those transporting the victim and the receiving medical facility that the person may be contaminated and thatthe risk to those treating such a patient is negligible but care should be taken to prevent inadvertent ingestion of contamination.
  - Identify and register potentially exposed/contaminated individuals, gather information that couldbe useful in reconstructing their dose to include medical symptoms and description of events.
  - Report to appropriate officials and obtain instructions
- Remain in the area until monitored.

Respond to action threshold

If an accident is confirmed

- Reassess and review, with allied departments and agencies, medium to long term protective actionssuch as food chain restrictions.
- Provide the population with information as to the likely health effects of the emergency by referenceto extant knowledge.
- Provide for detailed clinical and radiological review of affected persons.
- Establish a registry of persons to be tracked and to receive long-term medical follow-up.
- Base inclusion in the registry on objective criteria that indicate potential for an increase in theincidence of radiation induced cancer.
- Establish and maintain appropriate disease surveillance programme.
- Begin surveillance of any identified groups at-risk, e.g., screening for thyroid disease in children in anarea affected by radioactive iodine release.
- Assist Government authorities in planning a return to normal life for the population affected.
- Provide such specialized services as are needed to meet the demand for early recognition andtreatment of the stochastic consequences among affected people under a long term medical follow-

up programme.
- Make arrangements to promptly provide the public with the results of medical examinations.
- Arrange to provide useful, timely truthful, consistent and appropriate information to the publicregarding health consequences of the emergency. Use plain language explanation.

Maintain appropriate disease surveillance programme.

Analyze and interpret data

Time: Graph cases daily/weekly to analyze trends**Place:** Plot locations of household/industries

Person: Count weekly/daily cases and analyze demographic distribution

Laboratory confirmation

Diagnostic test	▪ Test for radiation **Required initial labs** ▪ Blood count with differential and repeat q 6h in order to evaluate lymphocytekinetics and to calculate the neutrophil/lymphocyte ratio. ▪ Serum amylase (baseline and qd after 24 h): A dose-dependent increase inamylase is expected after 24 h in the event of significant radiation exposure. **Important labs to obtain if feasible** ▪ Blood FLT-3 ligand levels – Marker for hematopoietic damage ▪ Blood citrulline – Decreasing citrulline indicates GI damage ▪ Interleukin-6 (IL-6) – Marker increased at higher radiation dose ▪ Quantitative G-CSF – Marker increased at higher radiation dose ▪ C-Reactive Protein (CRP) – Increases with dose; shows promise to discriminatebetween minimally and heavily exposed patients ▪ Cytogenetic studies with overdispersion index to evaluate for partial body exposure
Specimen	▪ Persons, material, tissues, atmosphere
When to collect the specimen	▪ When exposure situations suspected
How to prepare, store, and transport the specimen	
Results	General thresholds associated with various radiation dose thresholds ▪ Hematopoietic syndrome (> 1 Gy), ▪ GI syndrome (> 6-8 Gy), and Cardiovascular/CNS syndrome (> 20 Gy).

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RIFT VALLEY FEVER (RVF)

Background

- Rift Valley Fever (RVF) is a viral disease that affects mainly animals and occasionally humans. The virus is a member of the *Phlebovirus* genus, one of the five genera in the family *Bunyaviridae*. Thedisease is frequently reported following heavy rainfall and floods. It was first isolated in Rift Valley County of Kenya in 1930. The disease was reported in Kenya after the El Nino flooding of 1997/98 and more recently in 2006 to 2007. In 2007 and 2010, Tanzania and South Africa respectively were also affected. Other outbreaks have previously been reported in Somalia, Egypt, Saudi Arabia and Yemen.
- RVF is mainly transmitted from animals (sheep, cattle, goats, camels) to humans through close contact with infected animals (such as handling meat and body fluids and consumption of raw milk).During established RVF outbreaks in animals humans can also get infected through bites of infectedmosquitoes and other biting insects.
- The incubation period of RVF varies from 2 to 6 days. The clinical symptoms include an influenza- like illness, with sudden onset of fever, headache, myalgia and backache. These symptoms usually lastfrom 4 to 7 days. Most of the infected people recover on their own. However a small proportion (about 1%) get complications such as vomiting blood, nose bleeding and passing bloody stool. Othersevere types of the disease are eye disease and meningo-encephalitis.
- IgM antibodies typically appear from the fourth to sixth day after onset of symptoms
- Management of RVF in humans is mainly supportive as there is no definitive treatment for RVF. Earlydetection and management of the disease is important. Human control of RVF is through control of the disease in animals through a sustained vaccination program and limiting human-animal contact.Use of insecticide treated nets and mosquito repellants can also reduce infections in human. In addition to human suffering and death, RVF has far reaching economic implications to the Livestock
  industry. In outbreak settings, the disease manifestation includes non-hemorrhagic febrile syndromes,

RIFT VALLEY FEVER (RVF)

and laboratory testing should be considered among persons with milder symptoms suggestive of viralillness.

- Immediate Notification to WHO is formally required by IHR (Annex B in introduction)

Surveillance goal

Detect, confirm etiology and respond to outbreaks of all cases of suspected VHF promptly

Standard case definition

Suspected case:

Early disease:

- Acute febrile illness (axillary temperature >37.5 ºC or oral temperature of >38.0ºC) of more than 48hours duration that does not respond to antibiotic or antimalarial therapy, and is associated with:
  - Direct contact with sick or dead animal or its products **AND / OR**:
  - Recent travel (during last week) to, or living in an area where, after heavy rains, livestock die orabort, and where RVF virus activity is suspected/confirmed
- AND / OR:
  - Abrupt onset of any 1 or more of the following: exhaustion, backache, muscle pains, headache(often severe), discomfort when exposed to light, and nausea/vomiting **AND / OR**:
  - Nausea/vomiting, diarrhea OR abdominal pain with 1 or more of the following:
    - Severe pallor (or Hb < 8 gm/dL)
    - Low platelets (thrombocytopenia) as evidence by presence of small skin and mucous membrane hemorrhages (petechiae) (or platelet count < 100x109 / dL)
    - Evidence of kidney failure (edema, reduced urine output) (or creatinine > 150 mol/L) **AND /OR**:
    - Evidence of bleeding into skin, bleeding from puncture wounds, from mucous membranes ornose, from gastrointestinal tract and unnatural bleeding from vagina **AND / OR:**
    - Clinical jaundice (3-fold increase above normal of transaminases)**Late**

stages of diseases or complications (2-3 weeks after onset

- Patients who have experienced, in the preceding month a flu-like illness, with clinical criteria, whoadditionally develop the following:
  - CNS manifestations which resemble meningo-encephalitis **AND/OR:**
  - Unexplained visual loss **OR:**
  - Unexplained death following sudden onset of acute flu-like illness with hemorrhage, meningo-ecephalitis, or visual loss during the preceding month.

Confirmed case: Any patient who, after clinical screening, is positive for anti-RVF IgM ELISA antibodiesor tests positive on Reverse Transcriptase Polymerase Chain Reaction (RT-PCR).

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the appropriate levels.
- Enhance the usual standard precautions throughout the health care setting.
- Treat and manage the patient with supportive care.
- Collect specimen safely to confirm the case.

Respond to action threshold

If a single case is confirmed:

- Mobilize the community for early detection and care.

RIFT VALLEY FEVER (RVF)	
▪ Conduct community education about the confirmed case, how the disease is transmitted, and how toprevent contact with tissues of infected animals and avoid mosquito bites. ▪ Provide information about prevention in the home and when to seek care. ▪ Provide supportive treatment to all cases identified ▪ Request additional help from national levels as needed. ▪ Collaborate with the animal health specialists to search and document cases among animals as well.	
Analyze and interpret data	
Time: Graph cases and deaths monthly. Construct an epidemic curve during the outbreak.**Place:** Plot location of case households and work sites using precise mapping. **Person:** Immediate case-based reporting of cases and deaths. During the outbreak, count and report cases and deaths. Analyze age and sex distribution. Assess risk factors immediately and consider requestfor assistance to improve outbreak control.	
Laboratory confirmation	
Diagnostic test	Acute RVF can be diagnosed using several different methods. Serological tests suchas ELISA may confirm the presence of specific IgM antibodies to the virus. The virusitself may be detected in blood during the early phase of illness or in post-mortemtissue using a variety of techniques including, antigen detection tests by ELISA, RT-PCR, virus propagation (in cell cultures), Immunohistochemistry in formalin-fixed tissues. ELISA IgG can be used for retrospective diagnostic. Same test can be used for animal diagnosis
Specimen	ELISA (serology) ▪ Whole blood ▪ Serum or plasma ▪ Whole blood or clot ▪ Tissues (fresh frozen) RT-PCR – Virus isolation ▪ Blood ▪ Serum/plasma ▪ Liver biopsy from fatal cases Pathology ▪ Tissue biopsy from fatal cases Identical specimen can be collected from animal
When to collect the specimen	Collect specimen from the first suspected case. If more than one suspected case, collect until specimens have been collected from 5to 10 suspected cases.
How to prepare, store, and transport the specimen	Laboratory workers are at-risk. Samples taken from suspected human cases of RVFfor diagnosis should be handled by trained staff and processed in suitably equippedlaboratories. ELISA/PCR/ISOLATION ▪ Preparation and storage (freeze of refrigerate/as cold as possible) ▪ Shipping : frozen on dry ice or ice packs or both

RIFT VALLEY FEVER (RVF)	
	Note: if dry ice or ice packs are not available, sample may be shipped at roomtemperature and still provide valid results in most cases. **Immunohistochemistry:** ▪ Preparation and storage: Fix in formalin (can be stored up to 6 wks) ▪ Shipping: Room temperature (do not freeze). *Same shipping conditions for animal specimens*
Results	Diagnostic services for RVF are not routinely available. Advance arrangements areusually required for RVF diagnostic services. Contact the appropriate National authority or WHO. Contact national Veterinary Services for animal diagnostic
Reference	
▪ WHO/EMC Infection control for VHF in the African health care setting, WHO, 1998. ▪ WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2 ▪ Fact sheet Nº207 Revised September 2007. ▪ Infection Control for VHF in the African Health Care Setting /CDC (Annexes 11-12)	

SCHISTOSOMIASIS
Background
Schistosomiasis, commonly referred to as bilharzia,is a chronic diseases caused by a parasitic worm (blood fluke). That infests the blood veins of the urinary (venous plexus of bladder) and digestive sysyems (mesentric venules), and is endemic in developing countries mainly affecting irrigation, livestockfarmers, fishermen and people who use infested waters with the lavae (cercaria) for domestic use. It is the second most prevalent tropical parasitic disease (following malaria) and leading cause of severemorbidity for a long period of time in large parts of Africa, Asia and South America. It is reported by WHO, that 600 million people are at-risk, 250million are infected of whom 20 million are severely ill globally. There are 2 types of clinical disease: urinary schistosomiasis (S. haematobium) and intestinal schistosomiasis (S. mansoni, S. japonicum, S. intercalatum, S. mekongi). In Kenya the two major types of schistosomiasis are S.haematobia and S. mansoni. Approximately 6million are at-risk of infection Four endemic areas are recognized in the country. These include: Nyanza region; lower Eastern, partsof Central region and the Coastal region. Acute schistosomiasis is characterized by fever, headache, myalgia, and respiratory symptoms. Eosinophilia is present, as well as often painful hepato- and/or splenomegally. The clinical manifestations of chronic schistosomiasis are the result of host immune responses to schistosome eggs. Eggs secreted by adult worm pairs enter the circulation and lodge in organs and causegranulomatous reactions. Eosinophilia may be present. ***Schistosoma mansoni:*** Eggs most commonly lodge in the blood vessels of the liver or intestine and cancause diarrhea, constipation, and blood in the stool. Chronic inflammation can lead to bowel wall ulceration, hyperplasia, and polyposis and, with heavy infections, to periportal liver fibrosis and portal hypertension. ***Schistosoma haematobium:*** Eggs typically lodge in the urinary tract and can cause dysuria and

haematuria. Calcifications in the bladder may appear late in the disease. *S. haematobium* infection has been associated with increased risk of bladder cancer.

Surveillance goal

- To identify communities at high risk of the disease; assess infection levels according to geographicallocation and the need for treatment
- To provide baseline information to assess the impact of treatment during follow-up years
- To provide data on disease burden, drug susceptibility and risk factors associated with transmission

Standard case definition

Urinary schistosomiasis

Suspected: A person with visible haematuria **or** with positive reagent strip test for haematuria.
Confirmed: A person with eggs of S. *haematobium* in urine by microscopy.

Intestinal schistosomiasis

Suspected case: A person with chronic or recurrent intestinal symptoms (blood in stool, bloody diarrhea, diarrhea, abdominal pains) or, at a later stage, hepatosplenomegaly where malaria has beenruled out.

Confirmed: A person with eggs of S. *mansoni*, in stools by microscopy.

Recommended treatment strategies

WHO has developed guidelines for community treatment based on the impact the disease has on children in endemic areas.

- When a community reports greater than 50% children with blood in urine, everyone in the villagereceives treatment
- When 20-50% of children have bloody urine, only school age children are treated
- When less than 20% of children have symptoms mass treatment are not implemented but high-risk groups e.g. fishing community, irrigation community etc are examined and treated.

Analyze and interpret data

Place Map the distribution of schistosomiasis and identify implementation sub-counties or high riskcommunities that will require mass drug administration

Time: Monitor epidemiological trends over time of intervention

Person: Analyze the distribution of cases by age and other demographic factors

Laboratory confirmation

Diagnostic test	**Urine:** Microscopy demonstration of *S. haematobium* ova in urine and tissue by theurine filtration method. **Microhaematuria** detection by the chemical reagent strip **Stool:** Microscopy demonstration of *S. mansoni* ova in stool and tissue by the Kato-Katz method.
Specimen and when to collect	Mid-steam urine samples collected preferably between 10.00am to 2.00 pm Stool samples collected at any time of the day.
How to prepare, store, and transport the specimen	**Urine:** In a properly labeled screw cup universal bottles and keep upright at 2º to8ºC **Stool**: Collect 10 to 20 gms of stool in a clean dry poly pot and tightly close thecontainer. Keep at 2ºC to 8ºC.

SCHISTOSOMIASIS

Results	The microscopy results can be obtained within an hour from the time specimens are received in the laboratory.

Reference

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SEVERE ACUTE RESPIRATORY INFECTIONS (SARIS)

Background

- Severe acute respiratory infections (SARIs) are a significant cause of infectious disease morbidity andmortality in Africa. The mortality rates are particularly high among infants, children and the elderly.
- An improved understanding of the epidemiology and seasonality of SARIs in Africa is essential for optimizing public health strategies for their prevention and control (e.g., vaccines and antivirals forprophylaxis and treatment, infection control).
- The threat of SARIs due to novel organisms that have epidemic or pandemic potential warrants special precautions and preparedness. Respiratory disease events that may constitute a public healthemergency of international concern1 include severe acute respiratory syndrome (SARS); human influenza caused by a new subtype, including human episodes of avian influenza; pneumonic plague; and novel agents that can cause large-scale SARI outbreaks with high morbidity and mortality.

Surveillance goals

- To detect, in a timely manner, unusually severe morbidity and mortality caused by both known andunknown respiratory pathogens that have the potential for large scale epidemics or pandemics.
- To characterize and monitor trends in illnesses and deaths attributable to SARIs.

Standard case definition

Any patient presenting with an acute respiratory illness with onset during the previous 7 days requiringovernight hospitalization that includes:

- History of fever or measured fever of ≥ 38°C, AND
- Cough, **AND/OR**
- Shortness of breath or difficulty breathing

Severe acute respiratory infection (persons ≥ 5 years old)

Any severely ill person presenting with manifestations of acute lower respiratory infection with:

- Sudden onset of fever (>38ºC) AND
- Cough or sore throat AND
- Shortness of breath, or difficulty breathing
- With or without Clinical or radiographic findings of pneumonia

OR

Any person who died of an unexplained respiratory illness.

SEVERE ACUTE RESPIRATORY INFECTIONS (SARIS)

Confirmed case of SARS: An individual who tests positive for SARS-CoV infection by the WHO recommended testing procedures.

Respond to a alert threshold

If a single case of an epidemic- or pandemic-prone acute respiratory disease is suspected. OR If there isan unusual event (deaths, outbreak) due to severe acute respiratory infection:

- Atypical severe acute respiratory infection (SARI).
- Two or more persons presenting with SARI or who died from a SARI are detected with onset of illness in a two-week period and from, the same geographical area and/or are epidemiologically linked.
- Health-care workers with occupational exposure risks develop SARI after providing care to patientswith SARI.
- Persons who have contact with dead birds/animals present with SARI;
- Any rumor of clusters of persons with severe acute respiratory disease

Respond to a suspected case of an epidemic- or pandemic-prone acute respiratory disease or to an usualevent of severe acute respiratory infections:

- Report case-based information immediately to the appropriate levels.
- Practice infection control precautions for an acute respiratory disease with epidemic/pandemic potential[4] (e.g., Standard plus Contact plus Droplet Precautions) immediately and enhance Standard infection prevention Precautions throughout the health care setting.
- Treat and manage the patient according to national guidelines.
- Collect and transport laboratory specimens from suspected case and from symptomatic contacts andarrange for laboratory testing [5,6].
- Review clinical history and exposure history during 7days prior to disease onset.
- Identify and follow-up close contacts of suspected patient.
- Conduct active searches for additional cases.

Analyze and interpret data

Time: Graph cases and deaths daily/weekly/monthly. Construct an epidemic curve during the outbreak

Person: Characterize the illness in terms of clinical presentation, the spectrum of disease, the proportionof cases requiring hospitalization, clinical outcomes, case fatality ratio, attack rates by age/occupation/blood relation.

Place: Describe risk factors, possible exposures. Ascertain whether any evidence exists that the virus may have increased its ability to cause human disease or improved its transmissibility.

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

References

- International Health Regulations, IHR (2005)
- AFRO Technical Guidelines for Integrated Disease Surveillance in the African Region, May 2002
- WHO guidelines for investigation of human cases of avian influenza A (H5N1), January 2007.
- WHO interim guidelines on infection prevention and control of epidemic- and pandemic-proneacute respiratory diseases in health care, June 2007
- WHO guidelines for the collection of human specimens for laboratory diagnosis of avian influenzainfection, 12 January 2005
- Collecting, preserving and shipping specimens for the diagnosis of avian influenza A (H5N1) virusinfection. Guide for field operations, October 2006.

SEVERE PNEUMONIA IN CHILDREN UNDER 5 YEARS OF AGE

Background

- Infection of the lower respiratory track caused by bacteria or viruses transmitted from person-to- person via aerosolized respiratory droplets. The main bacterial causes of pneumonia among childrenare *Streptococcus pneumoniae* (the pneumococcus) and *Haemophilus influenzae* type b (Hib).
- Acute respiratory infections (ARIs) and pneumonia represent the number one cause of mortality among children less than 5 years of age.
- Incubation period is usually less than 7 days, depending on the etiology.
- The Ministry of Health recommends the use of Integrated Management of Childhood Illness (IMCI) guidelines to reduce morbidity and mortality attributable to childhood pneumonia. Early antimicrobial therapy has been shown to reduce mortality.
- Resistance of the pneumococcus and Hib to beta-lactams (for example, ampicillin), sulfonamides (forexample, trimethoprim-sulfamethoxazole) and other antimicrobials is increasing.
- Viruses such as respiratory syncytial virus (RSV) may also cause ARI and pneumonia.

Surveillance goal

- Identify pneumonia cases and epidemics early using clinical definitions.
- Monitor antimicrobial resistance routinely and during outbreaks.
- Reduce the proportion of severe pneumonia cases compared to non-severe pneumonia cases tomonitor quality of interventions.

Standard case definition

Clinical case definition (IMCI) for pneumonia:

A child presenting with cough or difficult breathing and:

- 50 or more breaths per minute for infant age 2 months up to 1 year
- 40 or more breaths per minute for young child 1 year up to 5 years.

(Note: A young infant age 0 up to 2 months with cough and fast breathing is classified in IMCI as"serious bacterial infection" and is referred for further evaluation.)

Clinical case definition (IMCI) for severe pneumonia:

A child presenting with cough or difficult breathing and any general danger sign, or chest indrawing or stridor in a calm child. General danger signs for children 2 months to 5 years are: unable to drink or breast feed, vomits everything, convulsions, lethargy, or unconsciousness.

Confirmed case: Radiographic or laboratory confirmation of pneumonia will not be feasible in mostsub-counties.

Respond to alert threshold

If you observe that the number of cases or deaths is increasing over a period of time:

- Report the problem to the next level.
- Investigate the cause for the increase and identify the problem.
- Make sure that cases are managed according to IMCI guidelines.
- Treat cases appropriately with recommended antimicrobial drugs

Respond to action threshold

If the number of case or deaths increases to two times the number usually seen during a similar period inthe past:

- Assess health worker practices of IMCI guidelines for assessing, classifying and treating children withpneumonia and severe pneumonia.
- Identify high risk populations through analysis of person, place and time.

SEVERE ACUTE RESPIRATORY INFECTIONS (SARIS)

- Conduct community education about when to seek care for pneumonia.

Analyze and interpret data

Time: Conduct month-to-month analysis for unexpected or unusual increases. Graph cases and deaths by month. Construct epidemic curve for outbreak cases. Plot month-to-month data and compare to previous periods.

Place: Plot location of case households.

Person: Count monthly pneumonia and severe pneumonia cases. Count pneumonia deaths. Analyze age distribution and vaccination status

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

- *Integrated Management of Childhood Illnesses*. World Health Organization. WHO/CDR/95.14.1

SEXUALLY TRANSMITTED INFECTIONS

Background

- Infections of the human genito-urinary and reproductive systems transmitted via human sexual contact (sexually transmitted disease, STIs). The most common causes of male urethral discharge are: a) the gonococcus *Neisseria gonorrhoea* and b) *Chlamydia trachomatis*. The most common causes of male and female genital ulcer are c) syphilis (*Treponema pallidum*), d) herpes simplex virus (HSV1 or2) and e) chancroid *(Haemophilus ducreyi*).
- STIs are endemic in most countries of the world, including countries in Africa. Multiple simultaneousSTIs are common (for example, gonorrhoea plus *Chlamydia*). STIs may be most highly prevalent inareas where HIV occurs and may facilitate HIV transmission or acquisition. STIs may be primary or from repeated attacks of urethral discharge.
- STIs are a leading cause of abortion and stillbirth, prematurity, and congenital infections. They maylead to pelvic inflammatory disease (PID), a major cause of decreased fertility.
- Incubation periods for gonorrhoea are 2 to 7 days; *Chlamydia* 7 to 14 days (or longer); syphilis, 10days to 12 weeks (usually around 3 weeks), and chancroid, 3 to 14 days.
- STIs may be more commonly diagnosed in men, in whom clinical evidence of infection may be morereadily apparent.

Surveillance goal

- Early detection and treatment of STI reduces transmission rates. Active efforts to diagnose latentsyphilis may prevent significant disability.
- Improve early and effective treatment of STIs using simple algorithms based on syndromic diagnosisfor index cases and partners.
- Carry out laboratory-based anti-microbial sensitivity monitoring and modify treatment guidelines accordingly at the national level.
- Compare surveillance data for both STIs and HIV/AIDS since STIs may reflect co-presence of HIV.

Standard case definition

Genital ulcer syndrome (non-vesicular):

Suspected case: Any male with an ulcer on the penis, scrotum, or rectum, with or without inguinal

SEXUALLY TRANSMITTED INFECTIONS

adenopathy, or any female with ulcer on labia, vagina, or rectum, with or without inguinal adenopathy.

Confirmed case: Any suspected case confirmed by a laboratory method. **Urethral discharge syndrome**:

Suspected case: Any male with urethral discharge with or without dysuria.

Confirmed case: *Urethral discharge syndrome*: A suspected case confirmed by a laboratory method (forexample Gram stain showing intracellular Gram-negative diplococci).

Public health action

- Conduct active case finding for specific target groups.
- Conduct partner tracing for complete treatment
- Screen all STI positive cases for HIV
- Conduct primary prevention activities such as promotion of safer sexual behaviours and provision ofcondoms.
- Assess use of algorithms for detection and treatment of STIs. And improve health worker practicewith algorithms.
- Include STI prevention and care services in maternal and child health, and family planning services.
- Target acceptable and effective STI prevention and care services to populations identified asvulnerable to STI transmission.
- Promote early STI health seeking behaviour.

Analyze and interpret data

Time: Graph cases each quarters , monitor for trends to inform public health action**Place:** No recommendation for analysis of place.

Person: Count quarterly cases and analyze age distribution.

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

Guidelines for Sexually Transmitted Infections Surveillance. Geneva. UNAIDS and World Health Organization. WHO/CDS/CSR/EDC/99.3. UNAIDS/99.33E

SMALLPOX (VARIOLA)

Background

- Smallpox is an acute contagious disease caused by variola virus, a member of the orthopoxvirus family. Other members of the genus include cowpox, camelpox, and monkeypox. Monkeypox virushas caused the most serious recent human poxvirus infections.
- Smallpox killed as many as 30% of those infected. In 1967, when WHO launched an intensified planto eradicate smallpox, the disease threatened 60% of the world's population and killed every fourth patient.
- The global eradication of smallpox was certified by a commission of eminent scientists in December 1979 and subsequently endorsed by the World Health Assembly in 1980.
- Smallpox had two main forms: variola major and variola minor. The disease followed a milder course in variola minor, which had a case-fatality rate of less than 1 per cent. The fatality rate of variola major was around 30%. There are two rare forms of smallpox: hemorrhagic and malignant.

SMALLPOX (VARIOLA)

In the former, invariably fatal, the rash was accompanied by hemorrhage into the mucous membranes and the skin. Malignant smallpox was characterized by lesions that did not develop to the pustular stage but remained soft and flat. It was almost invariably fatal.

- The incubation period of smallpox is usually 12–14 days (range 7–17) during which there is no evidence of viral shedding. During this period, the person looks and feels healthy and cannot infect others.
- The incubation period is followed by the sudden onset of influenza-like symptoms. Two to three dayslater, the temperature falls and the patient feels somewhat better, at which time the characteristic rashappears, first on the face, hands and forearms and then after a few days progressing to the trunk. Lesions also develop in the mucous membranes of the nose and mouth, and ulcerate very soon aftertheir formation, releasing large amounts of virus into the mouth and throat. The centrifugal distribution of lesions, more prominent on the face and extremities than on the trunk, is a distinctivediagnostic feature of smallpox and gives the trained eye cause to suspect the disease. Lesions progress from macules to papules to vesicles to pustules. All lesions in a given area progress together throughthese stages. From 8 to 14 days after the onset of symptoms, the pustules form scabs which leave depressed depigmented scars upon healing.
- Varicella (chickenpox) can be distinguished from smallpox by its much more superficial lesions, theirpresence more on the trunk than on the face and extremities, and by the development of successivecrops of lesions in the same area.
- Smallpox is transmitted from person to person by infected aerosols and air droplets spread in face-to-face contact with an infected person after fever has begun, especially if symptoms include coughing.The disease can also be transmitted by contaminated clothes and bedding, though the risk of infectionfrom this source is much lower.
- The frequency of infection is highest after face-to-face contact with a patient after fever has begun and during the first week of rash, when the virus is released via the respiratory tract.
- In the absence of immunity induced by vaccination, humans appear to be universally susceptible to infection with the smallpox virus.
- Vaccine administered up to 4 days after exposure to the virus, and before the rash appears, providesprotective immunity and can prevent infection or ameliorate the severity of the disease.
- Immediate Notification to WHO is formally required by IHR (2005).

Surveillance goal

- To detect and immediately respond to any suspected case of smallpox.

Standard case definition

Suspected case: An illness with acute onset of fever $\geq$ 38.3 °C (101 °F) followed by a rash characterized by vesicles or firm pustules in the same stage of development without other apparent cause.

Probable case**:** A case that meets the clinical case definition, is not laboratory confirmed, but has an epidemiological link to a confirmed or probable case.

Confirmed case**:** A clinically compatible case that is laboratory confirmed.

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the appropriate levels.
- Implement airborne infection control precautions.
- Treat and manage the patient with supportive care.
- Collect specimen safely to confirm the case.

- Implement contact tracing and contact management.
- Conduct active surveillance to identify additional cases.
- Notify WHO.

Respond to action threshold

If a single case is confirmed:

- Maintain strict infection control measures practices throughout the duration of the outbreak.
- Mobilize the community for early detection and care.
- Conduct community education about the confirmed case, how the disease is transmitted, and how toimplement infection control in the home care setting and during funerals.
- Conduct active searches for additional cases.
- Request additional help from national and international levels.
- Establish isolation ward to handle additional cases that may be admitted to the health facility.

Analyze and interpret data

Time: Graph cases and deaths daily/weekly/monthly. Construct an epidemic curve.**Place**: Map location of case households.

Person: Immediate case-based reporting of cases and deaths. During the outbreak, count and report casesand deaths. Analyze age and sex distribution. Assess risk factors immediately.

Laboratory confirmation

Diagnostic test	Isolation of smallpox (Variola) virus from a clinical specimen**OR** Polymerase chain reaction (PCR) assay identification of Variola DNA in a clinicalspecimen **Note:** Level C or D laboratories only.
Specimen	Biopsy specimens* Scabs* Vesicular fluid* Lesion skin (roof)* Pustule material* Blood samples *Note: blood samples from person where severe, dense rash may be difficult to draw as the skin may slough off. A central line may be needed for access in cases where a peripheral blood draw is difficult.* * Preferred specimens for diagnosis of acute illness during rash phase
When to collect	A suspected case of smallpox is a public health and medical emergency. Collect samples from every suspected case at available times to achieve specimen types recommended.
How to prepare, store, and transport	Typical practices associated with collection of patient specimens are appropriate forcollection of orthopoxvirus lesions as well. These include wearing personal protective equipment, including gloves and sanitizing the site prior to collection. If alcohol isused to prepare the lesion for collection it is important to allow the lesion to dry

SMALLPOX (VARIOLA)

	before it is collected. **Biopsy specimens:** Aseptically place two to four portions of tissue into a sterile, leak-proof, freezable container. Storage -20 °C to - 70 °C. Transport ~6h at 4 °C. *Note: package non-formalin lesion biopsy for shipping on dry ice, leave formalin fixed biopsy at room temperature. Do not freeze formalin fixed biopsy sample.* **Scabs:** Aseptically place scrapings/material into a sterile, leak-proof, freezablecontainer. Storage -20 °C to - 70 °C. Transport ~6h at 4 °C. **Vesicular fluid:** Collect fluid from separate lesions onto separate sterile swabs. Be sureto include cellular material from the base of each respective vesicule. Storage -20 °C to - 70 °C. Transport ~6h at 4 °C. **Blood:** Draw 10 cc of blood into a plastic marble-topped tube, or a plastic yellow-topped serum separator tube. ***Note:*** *approval must be obtained prior to the shipment of potential smallpox patient clinical specimens to a Reference laboratory.*
Results	Diagnostic services for smallpox are not routinely available. Advance arrangements areusually required for smallpox diagnostic services. Contact the appropriate National authority or WHO.

Reference

- WHO Fact Sheet, Smallpox. http://www.who.int/mediacentre/factsheets/smallpox

STROKE (CEREBROVASCULAR ACCIDENTS)

Background

A stroke, also known as a cerebrovascular accident (CVA), is the rapidly developing loss of brain function(s) due to disturbance in the blood supply to the brain. This can be due to ischemia (lack of blood flow) caused by blockage (thrombosis, arterial embolism), or a hemorrhage (leakage of blood). Asa result, the affected area of the brain is unable to function, which might result in an neurological deficitincluding inability to move one or more limbs on one side of the body, inability to understand or formulate speech, or an inability to see one side of the visual field.

A stroke is a medical emergency and can cause permanent neurological damage, complications, and death. Risk factors for stroke include old age, hypertension (high blood pressure), previous stroke or transient ischemic attack (TIA), diabetes, high cholesterol, cigarette smoking and atrial fibrillation. Highblood pressure is the most important modifiable risk factor of stroke.

Surveillance goal

- Estimation of disease burden and reduction of identified risk factors
- Monitor control and prevention activities
- Prevention of by early detection of risk factors
- Identification of high-risk groups and institution of preventive interventions
- Planning for the establishment of rehabilitation services
- Monitoring of prevention and control programs

Standard case definition

Suspected case: Any person presenting with sudden onset of temporary or permanent neurological

deficit

***Confirmed case*:** Any person presenting with sudden onset of temporary or permanent neurologicaldeficit with radiological evidence of brain hemorrhage or ischemia

Recommended public health action

- Health promotion for non-communicable diseases focusing on prevention of Stroke should be established, including community-based education on behavior change and adoption of healthy lifestyles
- Promote secondary prevention and treatment interventions at health facilities according to national guidelines.
- Tertiary Prevention Interventions (rehabilitation) should established

Analyze and interpret data

Time: Graph cases quarterly to analyze trends.

Place: Compare sub-county trends with national and regional trends.

Person: Analyze the distribution of cases by age and other demographic factors.

****Data for non-communicable diseases is often analyzed for long term trends***

Lab confirmation

The diagnosis of stroke is clinical.

Imaging techniques assist in determining the subtypes and cause of stroke.

Diagnostic test	CT Scan and MRI
Results	CT scanning of the head is typically used to detect infarction, tumours, calcifications, hemorrhage and bone trauma. Of the above, hypodense (dark) structures indicate infarction or tumours, hyperdense (bright) structures indicate calcifications and hemorrhage

Reference

- WHO, Atlas of heart disease and stroke, Geneva, World Health Organization, 2004.
- Prevention of recurrent Heart Attacks and Strokes in Low and Middle Income Populations, *Evidence –based recommendations for policy makers and health professionals*, WHO ,2003
- Non communicable Diseases: A strategy for the African Region, AFR/RC50/10
- Cardiovascular Diseases in the African Region: Current situation and perspectives, AFR/RC55/12
- http://www.who.int/chp/steps/en/
- http://www.afro.who.int/dnc/databases/afro_infobase/index.html
- WHO CVD-risk management package for low-and medium resource settings.
- "The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, andTreatment of High Blood Pressure" U.S. Department of health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute, NIH Publication No. 03-5233, December 2003
- http://www.cdc.gov/stroke/

TRACHOMA

Background

- Trachoma is the leading cause of preventable blindness worldwide. It is caused by infection with *Chlamydia trachomatis* bacteria, and is both treatable and preventable.
- Infections often begin during infancy or childhood and can become chronic. If left untreated, the infection eventually causes the eyelid to turn inwards, which in turn causes the eyelashes to rub on the eyeball, resulting in intense pain and scarring of the front of the eye. This ultimately leads to irreversible blindness, typically between 30 and 40 years of age.
- Trachoma is easily spread through direct personal contact, shared towels and cloths, and flies that have come in contact with the eyes or nose of an infected person.
- WHO estimates that approximately 6 million cases of blindness due to trachoma and 11 million casesof trichiasis occur worldwide each year. Prevalence of active disease in children varies from 10-40%in some African countries.
- In Kenya the population at-risk is estimated at more than 2.2 million and people living with trichiasisis approximately 67,000. Five endemic sub-counties have been confirmed while suspected sub-counties are 39
- The infection primarily affects young children, with blindness occurring later in life. Females are three times more likely than males to suffer from trichiasis, the in-turning of the eyelashes that can lead toblindness. People are most at-risk for trachoma infection in areas where there is poor sanitation, lack of latrines, poor sources of clean water, and the presence of flies.
- Primary interventions advocated for preventing trachoma infection include improved sanitation, reduction of fly breeding sites and increased facial cleanliness (with clean water) among children at-risk of disease. The scaring and visual change for trachoma can be reversed by a simple surgical procedure performed at village level which reverses the in-turned eyelashes.

Surveillance goal

- Prevention of blindness by early detection
- Identification of high-risk areas and epidemiologic trends
- Estimation of disease burden
- Monitoring of control programs

Standard case definition

Suspected case: Any patient with red sticky eyes who complains of pain and itchiness of the eyes.

Confirmed case**:** Any patient with red sticky eyes who complains of pain and itchiness of the eyes whereexamination of the eyes confirms one of the stages of Trachoma infection according to the **WHO Simplified Trachoma Grading System**. (See reference below).

Recommended public health action

The World Health Organization has developed a series of interventions to control trachoma known bythe acronym SAFE: Surgery, Antibiotics, Facial cleanliness, and Environmental improvement.

Effective Trachoma control has four main components:

- Eye lid surgery for those at immediate risk of blindness
- Antibiotics to treat individual cases and to reduce infection in a community
- The promotion of facial cleanliness and hygiene to reduce transmission
- Environmental improvements such as provision of water and household sanitation

Analyze and interpret data

Time: Monitor epidemiologic trends over time.

Place: Plot the location of case households and analyze the distribution. **Person:**

Analyze the distribution of cases by age and other demographic factors.

TRACHOMA

Lab confirmation	
Routine laboratory confirmation for surveillance is not required.	
Diagnostic test	Detection of specific antigen. Nucleic acid tests and tissue culture techniques. Occasionally, in epithelial cells in Giemsa or iodine stained smears by direct microscopy.
Specimen	Collection of conjunctival scrapings
When to collect the specimen	
How to prepare, store, and transport the specimen	After anaesthetizing the conjunctiva with anesthetic eye drops, blot away any discharge and using a spatula with a thin blunt end, scrape the whole of the conjunctiva. Spread the specimen evenly on a slide. As soon as the preparation is air-dry, fix it with methanol for 2-3 minutes if the preparation is to be Giemsa stained.
Results	Outside of specialist laboratories, most ocular infection is diagnosed clinically (see **Annex 8** on the recommended case definition for the confirmed case) or immunologically.

Reference

- WHO Trachoma Page: http://www.who.int/topics/trachoma/en/
- World Health Organization. Trachoma control: A guide for program managers.
- Geneva: World Health Organization, 2006.
- World Health Organization. Achieving Community Support for Trachoma Control**.**
- Geneva: World Health Organization, 2006.
- World Health Organization. Primary Health Care Level Management of trachoma**.**
- Geneva: World Health Organization, 2006.
- World Health Organization. Trachoma epidemiologic survey protocol**.**
- Geneva: World Health Organization, 2006.
- CDC Trachoma: http://www.cdc.gov/healthywater/hygiene/disease/trachoma.html
- The Carter Center: http://www.cartercenter.org/health/trachoma/index.html

TUBERCULOSIS

Background

- Infection of the lungs and other organs usually caused by Mycobacterium tuberculosis transmitted person-to-person by droplet infection through coughing, sneezing or spitting. Clinically, the pulmonary form of the disease is more common than the extra-pulmonary form. The cardinal symptoms of pulmonary TB are chronic cough, weight loss, fever, loss of appetite and night sweats.
- Tuberculosis (TB) is a leading cause of infectious illness and death worldwide with over 8 million newcases and 3 million deaths per year. In African countries, approximately 1.6 million of the new casesand over 600 000 cases occur each year. It is also estimated that between 30 and 50% of all new TBcases detected are infected with HIV and 40% of all AIDS deaths are due to TB. Those who are at highest risk of dying from TB include people with HIV/AIDS, malnutrition and other immuno- compromising conditions, the very young, and the very old.
- The global HIV pandemic has been a major cause of increasing TB cases, especially in African countries.
- Incubation period is approximately 1 to 3 months.
- WHO recommends the Directly Observed Therapy, Short-course (DOTS) strategy to maximize compliance and treatment efficacy and to reduce development of drug-resistant strains. The DOTS strategy has been implemented by at least 40 of 46 Member States in the African Region. Varying degrees of success have been achieved in controlling TB where resources and motivation for diagnosis, treatment, and patient follow up are adequate.
- Clinically, bacterial pneumonia, malaria, trypanosomiasis, HIV/AIDS and a variety of other bacterial, parasitic, and viral infections may cause similar syndromes of fever, cough, fatigue, and weight loss,or may themselves precipitate active TB in an already infected individual. Abdominal or other extra- pulmonary sites of infection may occur after ingestion of un-pasteurized cow's milk *(M. bovis*).

Surveillance goal

- Early detection and treatment of persons with infectious lung disease to improve chances of clinical improvement and reduce transmission of TB.
- Improve percentage of TB cases confirmed by microscopy

Standard case definition

Suspected case: Any person with a cough of 2 weeks or more in addition to weight loss, fever and nightsweats

Confirmed case:

- *Smear-positive pulmonary* TB: a) a suspected patient with at least one smear specimen positive foracid-fast bacilli (AFB), or b) one sputum specimen positive for AFB by microscopy and radiographic abnormalities consistent with active PTB as determined by the treating medical officer, or c) one positive sputum smear by microscopy and one sputum specimen positive on culture for AFB.
- *Smear negative PTB*: a patient who fulfils all the following criteria: a) two sets taken at least 2 weeksapart of at least two sputum specimens negative for AFB on microscopy, radiographic abnormalitiesconsistent with PTB and a lack of clinical response despite one week of a broad spectrum antibiotic, adecision by a physician to treat with a full course of anti-TB chemotherapy, or b) a patient who fulfilsall the following criteria: severely ill, at least two sputum specimens negative for AFB by microscopy, radiographic abnormalities consistent with extensive pulmonary TB (interstitial and miliary), a decision by a physician to treat with a full course of anti-TB chemotherapy, or c) a patient whose initial sputum smears were negative, who had sputum sent for culture initially, and whose subsequentsputum culture result is positive.

Respond to alert threshold

TUBERCULOSIS

If you observe that the number of cases or deaths is increasing over a period of time:

- Report problem to the next level, or according to national guidelines.
- Treat individual cases with direct observation (DOTS) including a treatment supporter.
- Where feasible, isolate persons using respiratory infection control practices, especially if multi-drugresistant TB is suspected.
- Investigate cause of increase, including performance of DOTS program in your area.

Respond to action threshold

If the number of cases or deaths increases to two times the number usually seen in a similar period in thepast:

- Assess health worker performance with detection and treatment of smear-positive PTB and improvepractices as needed.
- Assess DOTS program and take action to make identified improvements.
- Conduct drug susceptibility tests to establish patterns of resistance.

Analyze and interpret data

Time: Graph cases and deaths monthly.

Place: Plot distribution of case households and workplaces.

Person: Count monthly cases and deaths. Analyze age and sex distribution quarterly.

Laboratory confirmation

Diagnostic test	Microscopy: Presence of Acid Fast Bacillus (AFB) in Ziehl Neelsen (ZN) stained smears Culture and identification Drug susceptibility test: Anti-tuberculosis drug resistance occurs when a strain of *Mycobacterium tuberculosis* isolate is resistant to one or more antimicrobial agents as evidenced by internationally recommended methods for susceptibility tests) MDR =Resistance to Isoniazid and Rifampicin; X-DR= Resistance to Isoniazid and Rifampicin (MDR); plus, additional resistance to a fluoroquinolone and a second-line injectable agent
Specimen	Deep-chest sputum Aspirates
When to collect the specimen	Collect sputum (not saliva) spot and morning for direct smear microscopy andexamine at least two stained specimens taken on different days.
How to prepare, store, and transport the specimen	Smear should be examined at health facility where the specimen is taken. In case long distance transportation is required e.g., for TB culture, specimen shouldbe placed in three containers, i.e.: ▪ A primary container which has the specimen and is leakproof with a screw-cap. ▪ A secondary container which is durable, waterproof and made of metal or plastic with a screw-cap. It should have enough absorptive material to absorb the contents of the primary container should the latter break or leak. On its outside, the details of the specimen should be pasted. ▪ A tertiary container is usually made of wood or cardbox. It should be capable of withstanding the shocks and trauma of transportation.

TUBERCULOSIS

Results	TB microscopy is read daily. Quantification of observed mycobacterium are reported using various reporting methods. Refer to the criteria used by the examining laboratory. Culture: after 6-8 weeks Anti-tuberculosis drug resistance: The national reference laboratory should be linked to a Supranational reference laboratory by strain exchange to ensure quality control

Reference

- Treatment of Tuberculosis: Guidelines for National Programs. WHO/TB/97.230
- Policy Statement of Prevention Therapy Against TB in People Living with HIV, WHO/TB/98.255
- Laboratory Services in Tuberculosis Control, Parts I, II and III. WHO publications WHO/TB/98.258
- Guidelines to surveillance of drug resistance in tuberculosis 4th ed. WHO/HTM/TB/2009.422

TYPHOID FEVER

Background

- Typhoid fever is a bacterial disease, caused by Salmonella typhi. Symptoms usually develop 1–3 weeks after exposure, and may be mild or severe. They include high fever, malaise, headache, constipation or diarrhea, rose-coloured spots on the chest, and enlarged spleen and liver. Healthy carrier state may follow acute illness.
- Typhoid fever remains a serious public health problem throughout the world, with an estimated 16– 33 million cases and 500 000 to 600 000 deaths annually. In the last outbreak in the Democratic Republic of Congo, between 27 September 2004 and early January 2005, no less than 42 564 cases of typhoid fever were reported, including 214 deaths and 696 cases of peritonitis and intestinal perforations.
- In virtually all endemic areas, the incidence of typhoid fever is highest among children and young adults 5–19 years). The disease is almost exclusively transmitted by food and water contaminated by the faeces and urine of patients and carriers
- Polluted water is the most common source of typhoid transmission. In addition, shellfish taken from sewage-contaminated beds, vegetables fertilized with night-soil and eaten raw, contaminated milk and milk products have been shown to be a source of infection.
- Typhoid fever has been virtually eliminated in most areas of the industrialized world with the advent of proper sanitary facilities. Most cases in developed countries are imported from endemic countries.
- People can transmit the disease as long as the bacteria remain in their body; most people are infectious prior to and during the first week of convalescence, but 10% of untreated patients will discharge bacteria for up to 3 months.
- Typhoid fever can be treated with antibiotics. However, resistance to common antimicrobials is widespread. Healthy carriers should be excluded from handling food.

Surveillance goal

- Detect Typhoid Fever sporadic cases and outbreaks promptly, and seek laboratory confirmation
- Identify areas/population at high risk in order to improve prevention of the disease by taking hygienic measures

Standard case definitions

TYPHOID FEVER

Suspected case: Any person with gradual onset of steadily increasing and then persistently high fever, chills, malaise, headache, sore throat, cough, and, sometimes, abdominal pain and constipation ordiarrhea.

Confirmed case: Suspected case confirmed by isolation of *Salmonella typhi* from blood, stool, urine andbone marrow, bowel fluid or stool.

Respond to alert threshold

If Typhoid fever cases are suspected:

- Arrange for laboratory testing of stool specimens or rectal swabs of suspected cases, especially insituations where food- or waterborne transmission is suspected.
- Report and investigate all suspected outbreaks of typhoid. Search for case/carrier that is the source ofinfection and for the vehicle (water or food) through which infection is being transmitted.
- Treat typhoid fever patients with antibiotics. Severe cases should be provided with supportive measures such as oral or intravenous hydration, the use of antipyretics, and appropriate nutrition.

Respond to action threshold

If Typhoid Fever cases are confirmed

- Identify areas/populations at high risk to identify source(s) and mode(s) of transmission in order to prevent and control the disease.
- Conduct health education programmes on hygiene with simple messages on safe water, safe food handling practices, hygiene and handwashing.
- Support provision of clean water and proper sanitation to affected population(s). Chlorinate suspected water supplies. All drinking water should be chlorinated or boiled before use.
- More than 90% of patients can be managed at home with oral antibiotics, reliable care and close medical follow-up for complications or failure to respond to therapy. Patients with persistent vomiting, severe diarrhea and abdominal distension may require hospitalization and parenteral antibiotic therapy.

Analyze and interpret data

Time: Graph cases and deaths weekly. Construct an epidemic curve during outbreaks. **Place:** Plot location of case households with precise mapping.

Person: Report immediate case-based information for cases and deaths. Report summary totals monthly. During outbreak, count cases and deaths weekly. Analyze by age. Assess risk factors to improve prevention of outbreaks.

Laboratory confirmation

Diagnostic test	Culture: Isolation of *salmonella spp.* from stool or blood or other tissue orsecretions of a patient is the gold standard. The WIDAL Test should not be used for diagnostic purpose
Specimen	▪ Blood, urine, bone marrow ▪ Stool
When to collect	Collected samples preferably before antibiotics are administrated
How to prepare, store, and transport	▪ 5-10 ml of blood distributed in a blood culture bottle. ▪ Stool in stool container ▪ Store specimens at 4-8 C or ambient temperature away from heat anddirect sunlight.

TYPHOID FEVER

Results	▪ Blood culture 4 days to 2 weeks ▪ Stool 3-4 days.

Reference

- The diagnosis, Treatment and Prevention of Typhoid Fever; WHO/V&B/03.07
- Weekly Epidemiological Record; N° 1, 2005, 80, 1-8; http//www.who.int/wer
- WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2

VISCERAL LEISHMANIASIS

Background

Leishmaniasis is a disease that is caused by an intracellular protozoan parasite of the Genus Leishmania and transmitted by sandflies of the genus Phlebotomus. The disease occurs in three forms:

- Visceral leishmaniasis or kala-azar: Visceral leishmaniasis (VL) affects the reticulo-endothelial system i.e., liver, spleen and bone marrow and it is mainly caused by Leishmania donovani. The disease is usually fatal if not diagnosed and treated early.
- Cutaneous leishmaniasis: Cutaneous leishmaniasis (CL) manifests itself as nodular or open-lesionson the skin and it is caused by three distinct species of Leishmania which include - L. tropica, L. major and L. aethiopica. The disease usually starts as lesion at the site of inoculation. A crust develops centrally which may fall away exposing the ulcer which heals gradually, leaving a depressed scar with altered pigment
- Muco-cutaneous leishmaniasis.

Visceral leishmaniasis and Cutaneous leishmaniasis are the main forms in Kenya.

Globally, an estimated 500,000 cases of visceral leishmaniasis occur annually and over 90% of these cases come from six countries – Bangladesh, Brazil, Ethiopia, India, Nepal and Sudan. In Africa, visceralleishmaniasis is endemic in five countries namely Ethiopia, Kenya, Uganda, Somali and Sudan.

In Kenya it is estimated that about 4,000 cases occurs annually while 5 million people are at-risk of infection. Both visceral and cutaneous leishmaniasis are mainly found in the arid and semi-arid regions ofRift valley, Eastern provinces, North Eastern provinces and along the borders between Kenya and Uganda, Southern Sudan, Ethiopia and Somali.

Leishmaniasis is a poverty-related disease. It affects the poor and is associated with malnutrition, displacement, poor housing, illiteracy, gender discrimination, weakness of the immune system and lack ofresources. Leishmaniasis is also linked to environmental changes, such as deforestation, building of dams, new irrigation schemes and urbanization, and the accompanying migration of non-immune people to endemic areas.

Although its incidence is increasing, data for visceral leishmaniasis are scarce as there is no established effective surveillance system.

Surveillance goal

- To estimate burden of disease and establish populations at-risk
- To improve and focus the control activities
- To identify technical and operational difficulties
- To evaluate impact of control interventions
- To predict/anticipate epidemics

Aggregated data for reporting: Number of cases by age, sex, type of diagnosis.

Clinical description: An illness with prolonged irregular fever, splenomegaly and weight loss as its mainsymptoms.

VISCERAL LEISHMANIASIS

Standard case definition

Suspected case of Visceral leishmaniasis: Any person living or has traveled in an endemic area and complains of fever for more than two weeks, accompanied by abdominal swelling (splenomegally), general weight loss and in whom malaria has been ruled out or has not shown clinical response to effective anti-malarial drugs.

Suspected case of Cutaneuos leishmaniasis: Any person living in an endemic area who present with skinnodules or lesions that have lasted for more than two weeks.

Confirmed Case of Visceral leishmaniasis: A person who has fever of more than two weeks,splenomegaly and 'rK39' test is positive.

Confirmed Case of cutaneuos leishmaniasis: A person with skin nodules or lesion on the skin and amastigotes stage of the parasite has been confirmed in the tissue by microscopy.

Respond to alert threshold

If a single case is suspected:

If you observe that the number of suspected cases surpasses the normal threshold for that sub-county orclustering of cases over a short period:-

- Report the increase to the next level of the health system
- Reinforce the surveillance system
- Make weekly data reporting mandatory
- Treat all confirmed cases using appropriate drugs to minimize reservoir host
- Investigate the case to determine risk factors contributing to transmission
- Immediately start health education to the communities to-
  - Create awareness on leishmaniasis prevention and control measures
  - Use of personal prevention measure such as impregnated nets (LLINs)
  - Community members to volunteer for screening
  - To undertake vector control measures

Respond to action threshold

If a suspected epidemic is confirmed:

- Mobilize communities to enable rapid case detection and referral
- Identify high risk populations and target them for prevention measures
- Ensure the availability of essential supplies, including:
  - Drugs for treatment of leishmaniasis and for management of opportunistic infections invisceral leishmaniasis
  - Rapid diagnostic tests
  - Laboratory and parasitological diagnostic equipment
  - Surveillance and monitoring tools (including disease specific form)
- Train hospital and health centre staff in diagnosis and treatment algorithms and protocols and thebasic epidemiology of leishmaniasis
- Train community health workers in community sensitization and active case finding and referral,with a simplified case definition

Analyze and interpret data

Time: Graph cases and deaths.

Place: Plot location of case households. Incidence by geographical area**Person:** Count monthly cases and deaths.

Tables: Incidence by age, sex, type of diagnosis, risk group, by clinical features, by month/year.

NB. Data will be compiled on monthly basis. During outbreak periods data should be compiled andsubmitted weekly.

Laboratory confirmation

VISCERAL LEISHMANIASIS

Tests	**Visceral leishmaniasis:** ▪ Rapid dipstick 'rK39' test is the recommended serological diagnosis test for kala azar. Samples are collected from suspected cases using the case definition criteria. ▪ Splenic and bone marrow aspiration tests: These tests are considered as the "goldstandard" for the diagnosis of kala-azar. They are recommended in the following setting: o When 'rK39' test is negative but the suspicion of kala-zar is high o In kala-azar patients diagnosed by 'rK39' who do not respond to first-linetreatment o Patients with kala-azar/HIV co-infection o For quality assurance **Diagnostic test for Cutaneous leishmaniasis:** ▪ Slit-incision on the skin nodules or lesion edge, whereby exposed tissue and fluid are scraped onto a slide. Smears are prepared from the materials obtained and stained with Giemsa. Examination of the slide on a microscope will show presenceof amastigotes stage of the parasite, confirming the disease.
Specimen	**Rapid test:** One drop of blood drawn from a finger stick and placed in a test strips. **Splenic/bonemarrow aspirate:** The samples are collected by piecing the spleen or thebone marrow of the patient. The procedures are invasive with risky to the patient, andtherefore not recommended for routine use. Only trained personnel should carry out these tests in well-equipped hospitals. **Nodular tissue or secretions** examined under microscope slide
Results	**Rapid test:** The results are available within 20 minutes **Aspirate and incisional specimen:** Demonstration of amastigotes stage of the parasite on a microscope slide confirms the disease. Demonstration of amastigotes stage of theparasite on a microscope slide confirms the disease.

Reference

▪ Control of the Leishmaniasis: Technical Report series: 949. Report of a meeting of the WHO expertcommittee on the control of leishmaniasis, Geneva, 22-26 march 2010

YELLOW FEVER

Background

- Viral hemorrhagic disease caused by a flavivirus transmitted human-to-human via *Aedes* mosquitoes(urban epidemics) or via forest mosquito species and forest primate reservoirs (jungle cycle).
- Large scale outbreaks every 3 to 10 years in villages or cities. Sporadic cases can occur regularly in endemic areas. Resurgence of disease in Africa since mid-1980s. True incidence far exceeds reportedcases.
- Incubation period 3 to 6 days after the bite from an infected mosquito.
- While only the minority of cases are severe, case fatality rate may be 25% to 50% among patientswith syndrome of hemorrhage, jaundice, and renal disease.
- Risk factor: sporadic cases often linked to occupation or village location near woods or wheremonkeys are numerous. Also non-vaccinated persons.
- International reporting to WHO required within 24 hours.
- VHF and other infections causing hemorrhage may mimic yellow fever.

YELLOW FEVER

Surveillance goal

- Detect hemorrhagic fever cases and outbreaks promptly, and seek laboratory verification of the etiology of all cases of suspected yellow fever. (Other viral hemorrhagic fevers, dengue, anthrax, leptospirosis, rickettsial diseases, malaria, and other infectious agents and toxic exposures may causesimilar epidemics.)

Standard case definition

Suspected case: A person with acute onset of fever followed by jaundice within two weeks of onset offirst symptoms. Hemorrhagic manifestations and renal failure may occur.

Confirmed case: A suspected case with laboratory confirmation (positive IgM antibody or viral isolation) or epidemiologic link to confirmed cases or outbreaks.

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the next level.
- Treat and manage the patient with supportive care administered under a bednet (ORS, paracetamol for dehydration, fever) and strict isolation procedures.
- Collect specimen for laboratory confirmation.
- Investigate the case to determine how transmission occurred.
- Plan for an immunization activity.

Respond to action threshold

If a single case is confirmed:

- Mobilize community early to enable rapid case detection and treatment.
- Conduct a mass campaign in appropriate age group in the area (ages 6 months and older) and inareas with low vaccine coverage.
- Identify high risk population groups and take steps to reduce exposure to mosquitoes.
- Improve routine and mass vaccination campaigns to include yellow fever in high-risk areas.

Analyze and interpret data

Time: Graph cases and deaths monthly. During an outbreak, graph cases and deaths weekly. Construct anepidemic curve during outbreaks.

Place: Plot location of case households and occupation with precise mapping.

Person: Report immediate case-based information for cases and deaths. Report summary totals monthly. During outbreak, count cases and deaths weekly. Analyze by age. Assess risk factors to improve prevention of sporadic outbreaks.

Laboratory confirmation

Diagnostic test	ELISA for the presence of yellow fever IgM antibodies
Specimen	Serum
When to collect the specimen	Collect specimen from the first suspected case of yellow fever. If more than 1 suspected case, collect until specimens have been collected from 5 to 10 suspectedcases.
How to prepare, store, and transport the specimen	▪ Collect 10 ml of venous blood from adults, 1-5 ml from children. In a standardglass test tube, capillary tube or microtainer. ▪ Separate blood cells from serum: o Let clot retract for 30 to 60 minutes at room temperature. Centrifuge at

YELLOW FEVER	
	2000 rpm for 10-20 minutes and pour off serum into a clean glass tube. o If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clotretracts. Pour off serum the next morning. o If no centrifuge and no refrigerator, let blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle. Pour off serum into aclean tube. ▪ Store serum at 4°C. ▪ Transport serum samples using appropriate packaging to prevent breaking or leaks during transport
Results	The specimen should arrive at the laboratory within 3 days of being collected.Avoid shaking of specimen before serum has been collected. To prevent bacterial overgrowth, ensure that the serum is poured into a clean glasstest tube. The test tube does not need to be sterile – just clean. Transport the serum in an EPI hand vaccine carrier at 4EC-8EC to prevent bacterial overgrowth (up to 7 days). If not refrigerated, serum stored in a clean tube will begood for at least 3 days.
Reference	
▪ Sub-county guidelines for yellow fever surveillance. WHO 1998 WHO/GPVI/EPI/98.09 ▪ Yellow Fever. 1998. WHO/EPI/Gen/98.11	

b. ANNEXES TO SECTION 11

The following annexes are examples of program specific forms. Some forms are for documenting initial findings while others are designed for in-depth investigation. Refer to your country's national surveillance program for the appropriate forms.

ANNEX 11A AEFI - investigation form

ANNEX 11B Cholera - case-based investigation form

ANNEX 11C Kenya Guinea worm - investigation of rumour/suspected guinea worm case form

ANNEX 11D Guinea worm - case investigation form

ANNEX 11E Maternal death - reporting form

ANNEX 11F Tuberculosis - MDR and XDR TB - case-based reporting form

ANNEX 11G VHF - case investigation form

AEFI Investigation

An adverse event following immunization (AEFIs) is a medical incident that takes place after an immunization, causes concern and is believed to be caused by the immunization. Programmes providingimmunization services should include a system for AEFI detection and reporting, investigation and management, data analysis, corrective action, relevant communication and evaluation of the system. The ultimate goal of an investigation is to determine whether the vaccine or immunization process is responsible for the reported event(s) or to find another cause and correct it if possible, and reassure thepublic.

Further resources: http://www.who.int/immunization_safety/aefi/en/

http://www.who.int/immunization_safety/aefi/managing_AEFIs/en/index6.html

http://www.who.int/immunization/documents/792.pdf

1.	**Be prepared (Steps to take before an event occurs)** • Read the resource documents on reporting, management and investigation of AEFIs. • Develop standards: case definitions for reportable AEFIs, use of reporting forms and investigation procedures. • Designate and train staff to conduct an AEFI investigation using the investigation form. • Train staff on how to collect specimens. • Establish procedure, criteria and designated person for notifying WHO and UNICEF • (if UN- supplied vaccine) or other relevant party depending on procurement mechanism • Establish a National Technical Advisory Committee with representation from major medical organizations • Identify a spokesperson for public communications.
2.	**Receiving a report** • Ensure immediate reporting of most serious events and rapid attention to reports received • Verify the information in the report and classify and assess the AEFI using established casedefinitions. Decide whether it needs further investigating. • If investigation is warranted, travel to the location of the AEFI, or delegate responsibility toanother trained person
3.	**Investigate and collect data** • Ask about the patient • Ask about the vaccine and other drugs potentially received • Ask about other vaccinees • Ask about immunization services • Observe the service in action • Ask about cases in unvaccinated persons • Establish a more specific case definition if needed • Formulate a hypothesis as to what caused the AEFI **Collect specimens if appropriate:** • from the patient

	• the vaccine (and diluent if applicable) • the syringes and needles
4.	**Dispatch specimens** to appropriate testing facility (laboratory, regulatory authority, etc.)
5.	**Analyze the data** • Review epidemiological, clinical, and laboratory findings • Summarize and report findings
6.	**Take action** ☐ Communicate with health staff ☐ Communicate findings and action to the parents and public ☐ Correct problem (based on the cause) by improving training, supervision, and/or distribution of vaccines/injection equipment ☐ Replace vaccines if indicated

(To be used during cholera outbreaks)

Cholera Case Investigation Form		
Area : Patient and clinical laboratory related information		
	Variables/Questions	**Answers**
1	Detection day (ddmm/yyyy)	
2	Detection place (Health facility or Community)	
3	Patient identification number (yyyy-week-CCC-PPP-DDD-Reporting site-nnn)	
4	Patient surname or last name	
5	Patient first name(s)	
6	Age (years)	
7	Sex (F/M)	
8	Number of people in same household	
	Number of people in same household with cholera	
9	Patient's residential Address	
	Contact phone number	
10	Village/Town	
11	Neighborhood	
12	Sub-county	
13	County	
14	Country	
15	Date of onset (first symptoms) (ddmm/yyyy)	
16	Clinical signs and Symptoms	
17	Was patient exposed to any known risk factor for thisdisease? (Yes/No)	
18	If yes, specify risk factor(s): Water used by the patient for drinking : (list by type, e.g. tap water, Borehole, unprotected well, protected well, River, dum, lake, pond)	
19	Number of doses of cholera Vaccine	
20	Date last dose was administered	
21	Laboratory related information: at least first and lastcases	
22	*Vibrio cholerae* identified in stools?	
23	Drugs to which the vibrio strain is sensitive	
24	Drugs to which the vibrio strain is resistant	
25	Outcome (Died, Survived, Unknown)	

26	Final Classification (Not a case, Suspect, Probable, Confirmed by Lab, Confirmed by epidemiological link,Pending)	
27	Other Notes and Observations	
28	Date latest update of this record (dd/mm/yyyy)	
Area: Risk factor search (Information to be obtained from the water and sanitation group of theinvestigation team)		
	Variables/Questions	**Answers**
	Mapping Potential Hazards	
1	**Potential vibrio vehicles: drinking water**	
2	Drinking water source 1	
3	Drinking water source 2	
4	Drinking water source 3	
5	Drinking water source 4	
6	**Potential vibrio vehicles: non drinking water**	
7	Non drinking water source 1	
8	Non drinking water source 2	
9	Non drinking water source 3	
10	Non drinking water source 4	
11	**Potential vibrio vehicles: Food items**	
12	Food items 1	
13	Food items 2	
14	Food items 3	
15	Food items 4	
	Food items 5	
17	Food items 6	
18	Food items 7	
19	Food items 8	
20	**Bacteriology lab findings**	
21	Drinking water foundcontaminated by vibrio	
22	Non drinking water found contaminated by vibrio	
23	Food items found contaminated by vibrio	
24	**Looking out for Exposure to the identified hazards**	
25	Water used by the patient for drinking : (list by type, e.g.tap water, Borehole, unprotected well, protected well, River, dum, lake, pond):	
26	Within 3 days prior to the onset of the disease did thepatient drink from	
27	Water source 2 (Yes/No)	

28	Water source 3 (Yes/No)	
29	Water source 4 (Yes/No)	
30	Water source 5 (Yes/No)	
31	Within 3 days prior to the onset of the disease did the patient eat	
32	Food item 1 (Yes/No)	
33	Food item 2 (Yes/No)	
34	Food item 3 (Yes/No)	
35	Food item 4 (Yes/No)	
36	Food item 5 (Yes/No)	
	Travel to a high risk area	
37	Within 3 days prior to the onset of the disease did thepatient attend any	
38	Funerals (Yes/No)	
39	Other social event (Yes/No)	

GW F1

KENYA GUINEA WORM ERADICATION PROGRAMME
CASE INVESTIGATION FORM FOR GUINEA WORM DISEASE

Reporting Information

Village: Division: Sub-county:
Reporting Health Facility: Reporting Officer: Designation: Date:

Details of investigation

S/No	Patient Name	Age	Sex	Place of residence *(Leave this blank if the place of residence is the same as the place of reporting)*		Date rumour Reported	Reported By	Date Rumour Investigated	Investigated By	Outcome *(Confirmed GW case/ Pending/ Discarded)*	Date of Emergence of first GW	Cross Notification *(Done if Confirmed GW Case's place of reporting is different from place of residence)*	Epid No.
				Village	Sub-county								

*Serial number: This indicates the cumulative sequence of rumours reported since the beginning of the year.
** Epidemiological number: Is assigned by the county and is the link to the case in Form GWEP 3

Total number of rumours/suispected invesigated during the year: Total number of confirmed guinea worm case during the year:
Total number of confirmed guinea worm cases cross-notified:

Date Report Sent to Sub-county level: Date Rep[ort Received at the Sub-county Level:
Sent By: Received By:

KENYA GUINEA WORM ERADICATION PROGRAMME
CASE INVESTIGATION FORM FOR GUINEA WORM DISEASE

To be completed in triplicate **Epid No:**_ _ _-_ _ _-_ _ _-_ _-_ _ _ _

I. Reporting/Investigation Information

Reporting Village:_____ Sub-county:_____ County:_____

Date Case Reported: (dd/mm/yyyy)_____/___/_____ Reported by:_____ Position:_____

Date Case Investigated:_____/___/_____ Investigated by:_____ Position:_____

II. Patient Information and Place of Residence

Name:_____ Father's Name/Landlord's Name:_____

Age:_____ Sex:_____ Occupation:_____

Resident Address: Village:_____ Zone:_____

Area/Sub Sub-county:_____ Sub-county:_____ Region/County_____

Setting: Urban/Rural_____ Land Marks:_____

Phone number _____

Place of residence is same as the reporting village: YES/NO Residence since when(in months):_____

(Please fill BOX "III. Place stayed in the last 10-14 months …." if the number of months stayed in this box was less than 10.)

III. Place stayed in the last 10-14 months if not the same as above.

Village:_____ Zone:_____ Area/Sub Sub-county:_____

Sub-county:_____ Region:_____ Country:_____

IV. Travel History of patient in the last 10-14 months

Date From:	Date To:	Village:	Sub Sub-county	Sub-county:	Region:

Possible water sources that the patient might have contaminated with location details and GPS:if available

Name	Lattitude	Longitude	Type	Source	Check box if Treated with Abate and Date
					☐ _____
					☐ _____
					☐ _____
					☐ _____

V. Sign and symptom

What was the first sign/symptom before the emergence of worm? Blister/Itching/Swelling/Others, Specify_____

Emergence of guinea worm: YES/NO No of Worms:_____ Is this the first guinea worm emerged this year? YES/NO

KENYA GUINEA WORM ERADICATION PROGRAMME
CASE INVESTIGATION FORM FOR GUINEA WORM DISEASE

To be completed in triplicate **Epid No:**_ _ _-_ _ _ -_ _ _-_ _-_ _ _ _

Date of the First guinea worm emerged:_____/___/_____Was the case detected before worm emerged? YES/NO

VII. Case Containment Measures and Guinea-worm registry

Received any health education: YES/NO Patient entered any water source: YES/NO

Place Managed: CCC/Home/Health Centers/Hospital

Name of Health Facility/Health Center/Other Centers if patient was hospitalized:____ Admission Date:

_____/____/_____` Discharged Date:_____/____/_____

SN.NO.	Location of worm	Date worm detected	Date guinea-worm Extracted/emerged	Date confirmed by supervisor:	Date guinea-worm completely expelled
_____	_____	___/____/_____	___/____/_____	___/____/_____	___/____/_____
_____	_____	___/____/_____	___/____/_____	___/____/_____	___/____/_____
_____	_____	___/____/_____	___/____/_____	___/____/_____	___/____/_____
_____	_____	___/____/_____	___/____/_____	___/____/_____	___/____/_____
_____	_____	___/____/_____	___/____/_____	___/____/_____	___/____/_____
_____	_____	___/____/_____	___/____/_____	___/____/_____	___/____/_____
	_____	___/____/_____	___/____/_____	___/____/_____	___/____/_____
_____					

VIII. Specimen Handling

Was a specimen (worm) saved and preserved in alcohol? YES/NO If NO WHY?

Date sent to Region:_____Received By:_____Date Received:_____

Date sent to National:_____Received By:_____Date Received:_____

For National Secretariat Only:

Did you send it for confirmation? Yes/No Date sent:_____Sent To:_____

Date Result Received_____

Result:

IX. Other Information

Use of cloth filter: YES/NO Frequency of changing filters 1-rarely; 2-sometimes; 3-always; 4-never

Remarks:_____

Person who completed this form:

_____ _____ _____ _____

NAME POSITION CELL PHONE NO SIGNATURE

c. Maternal Death Notification (MDN) Form CONFIDENTIAL *MOPHS*

For official use only						MDN Form number						

INSTRUCTIONS

1. ***This form must be completed for all deaths, including abortions and ectopic gestation related deaths, in pregnant women or within 42 days after termination of pregnancy irrespective of duration or site of pregnancy***
2. ***Mark with a tick where applicable***
3. ***The MDN form to be filled by the most Senior Health Worker at that level, in consultation with immediate care givers***
4. ***The forms should be filled in 4 copies; the original remains in the facility, one copy sent to the Sub-county MD Committee, the Provincial MD committee and theNational MD Committee***
5. ***The form should be filled immediately after the occurrence of death (within 24 hours)***
6. ***These confidential forms should be in the custody of the Nursing Officer i/c and the Secretaries of the MDR committees***
7. ***The form should have no names, or any other identification details of the deceased***
8. ***For Coding purposes: 1=community/home, 2=dispensary, 3=Health Centre, 4=Sub-sub-county/ Sub-county hospital, 5=Provincial, 6=National/Teaching***

1. Locality where death occurred

Province		Sub-county		Level of care code ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6
Managing authority ☐ Public ☐ NGO/FBO ☐ Private ☐ Other, specify				

2. Details of deceased

Age yrs ☐☐	Citizenship	Para	+☐ ☐	Gravida	☐☐	Gestation (weeks) (or at delivery)	☐☐	Days since delivery/abortion	☐☐

3. Details of Admission (where death occurred)

Date of admission:							Time of admission:	Date of death:						Time of death:
Main reason for admission:							Referral from another centre?yes ☐ ☐ no ☐ unknown		If "Y" from:					Level of care code ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6
Stage of pregnancy on admission:							☐ Ectopic pregnancy ☐ Aborting ☐ Antepartum ☐ Intrapartum ☐ Puerperium							
Condition on admission:							☐ Stable ☐ Critically ill ☐ Dead on arrival ☐ Other, specify							

Stage of pregnancy at moment of death:	☐ Abortion ☐ Ectopic pregnancy ☐ Antepartum ☐ Intrapartum ☐ Puerperium

4. Antenatal and Delivery Care

Did she receive antenatal care? ☐ yes ☐ no ☐ unknown	If "Y"	Level of care code ☐1 ☐2 ☐3 ☐4 ☐5 ☐6	No. of visits ☐1 ☐2 ☐3 ☐4 ☐>4
Did she receive any Emergency Obstetrics Care? ☐ yes ☐ no ☐ unknown	If "Y"	Level of care code ☐2 ☐3 ☐4 ☐5 ☐6	
Delivery ☐ yes ☐ no	If "Y"	☐ SVD-skilled ☐ SVD-unskilled ☐ Vacuum ☐ CS ☐ Destructive operation ☐ Other, specify	
Baby outcome, tick	☐ Alive ☐ Fresh stillbirth ☐ Macerated stillbirth ☐ Neonatal Death		

5. Cause of death

Direct cause ☐ yes ☐ no	If "Y"	☐ Hemorrhage ☐ Infection ☐ Eclampsia ☐ Obstructed labour ☐ Abortion
Indirect cause ☐ yes ☐ no	If "Y"	☐ Malaria ☐ Anaemia ☐ HIV/AIDS ☐ Cardiovascular ☐ Other specify

6. In your opinion were any of these factors present

System	Factors
Personal / family (1st delay)	☐ Failure to recognise danger signs ☐ Ignorance of available services ☐ Delay in woman seeking help ☐ Cultural / religious reasons / objections Poverty ☐ High cost of treatment ☐ Other, specify
Access to skilled attendance (2nd delay)	☐ Lack of communication / transport from home to health care facility ☐ Lack of communication / transport between health care facilities ☐ Long distances / poor roads ☐ Refusal of treatment or admission ☐ Other, specify
Quality of care (3rd delay)	☐ Lack of skilled human resources ☐ Poor attitude ☐ Low morale ☐ Poor interpersonal relationship ☐ Lack of expertise ☐ Lack of skills ☐ Lack of blood for transfusion ☐ Lack of emergency/essential drugs (e.g. antibiotics, oxytocics, anticonvulsants, iv fluids) Lack of equipment or supplies ☐ Inappropriate/delayed interventions ☐ Other, specify

Case based Multi-Drug Resistant and Extensively Drug Resistant Tuberculosis Report Form

County:	**Year:**	
Quarter:	**Month:**	**Drug Susceptibility Test Results (S=sensitive; R=Resistant; I=intermediate; U=unknown)**

*** Multi-drug Resistant TB =** Resistance to at least Isoniazid and Rifampicin

****Extensively Drug Resistant TB =** MDR-TB plus: Resistance to any fluoroquinolone such as Ciprofloxacin, Oxfloxacin, etc, andResistance to at least one of the three second line injectable anti-TB drugs (Capreomycin, Kanamycin and Amikacin).

First-line drugs: H = Isoniazid R = Rifampicin E = Ethambutol Z = Pyrazinamide S = Streptomycin Th = Thioacetazone

Second-line drugs: Am=Amikacin Km=Kanamycin Cm=Capreomycin Cfx=Ciprofloxacin Ofx=Ofloxacin Lfx=LevofloxacinMfx=Moxifloxacin Gfx=Gatifloxacin Pto=Protionamide Eto=Ethionamide Cs=Cycloserine PAS=P-aminosalicylic acid

ID Case

Date of reception:___/___/___

Date of detection of the case ___/___/___

This Case was notified by *(tick off the right answer and specified)*

ϒ Mobile team, #_____ □ Health Centre _____

ϒ Hospital _____ □ Others: _____

Form filled by (first name and surname) _____

Information given by (first name and surname)_____

Family link with the patient _____

Identity of the patient

First name:_____Surname_____

Nickname _____

For the babies, son/daughter of (name of father) _____

Birth date:____/___/____Age (years)_____Sex □ M □ F

Permanent address: Head of Household (first name and surname) _____

Village/Suburb_____ Country_____GPS lat_____long _____

Nationality:_____Ethnic group _____

Profession of the patient *(tick off the right answer)*

ϒ Miner □ House wife □ Hunter/trading game meat □ Children

ϒ Pupil/ Student □ Farmers □ Health staff, details: Name of health care facility_____

Service_____qualification _____

ϒ Others _____

Status of the patient

Status of the patient at detection □ Alive □ Death

If dead, please specify date of death:_____/___/____

Place of death: □ Community, name village_____Country_____

□ Hospital, name and service_____ Country _____

Place of the funerals, name village: _____ Country_____

History of the disease

Date of onset of symptoms:__/_____/____

Name of the village where the patient got ill _____ Country_____

Did the patient travel during illness : □ Yes □ No □ DNK

If Yes, indicate the places and the country:

Village_____ Health Centers_____Country_____

Village _____ Health Centers_____Country_____

Did the patient have fever**?** □ Yes □ No □ DNK. If yes, date of onset for the fever:_____/___/____

Does or did the patient have the following symptoms (*tick off when apply)*

Headache:	□ Yes	□ No	□ DNK	Skin Rash	□ Yes	□ No	□ DNK
Vomiting/Nausea	□ Yes	□ No	□ DNK	Bleeding from injection sites	□ Yes	□ No	□ DNK
Anorexia/Loss of Appetite	□ Yes	□ No	□ DNK	Bleeding gums	□ Yes	□ No	□ DNK
Diarrhea	□ Yes	□ No	□ DNK	Bleeding into eyes (red eyes)	□ Yes	□ No	□ DNK
Intense Fatigue	□ Yes	□ No	□ DNK	Black or bloody stool	□ Yes	□ No	□ DNK
Abdominal Pain	□ Yes	□ No	□ DNK	Blood in vomits	□ Yes	□ No	□ DNK
Muscle or Joint Pain	□ Yes	□ No	□ DNK	Bleeding from nose	□ Yes	□ No	□ DNK
Difficulty swallowing	□ Yes	□ No	□ DNK	Bleeding from vagina	□ Yes	□ No	□ DNK
Difficulty breathing	□ Yes	□ No	□ DNK	Hiccoughs	□ Yes	□ No	□ DNK

d. Exposition Risks

- Was the patient hospitalized or did he visit anyone in the **hospital** anytime in the three weeks beforebecoming ill? □ Yes □ No □ DNK; If Yes, where_____between (dates)_____/___/___ and__/_____/___
- Did the patient have visit/consult a **traditional healer** during the three weeks before becoming ill orduring illness? □ Yes □ No □ DNK; If Yes, name of the traditional healer _Village_____Country_____;

  When and where did the contact take place? Place_____date:__/_____/_____
- Did the patient receive traditional medicine? □ Yes □ No □ DNK; If Yes, explain which kind:

_____

- Did the patient attend **funeral ceremonies** during anytime in the three weeks before becoming ill? □ Yes □ No □ DNK;
- Did the patient **travel** anytime in the three weeks before becoming ill? □ Yes □ No □ DNK If Yes, where_____between (dates)_____/___/____and____/___/____
- Did the patient have a contact with a **known suspect case** anytime in the three weeks before becomingill? □ Yes □ No □ DNK; If Yes, Surname_____First name _____ ID Case
- During the contact, the suspect case was □ Alive □ Dead date of death_____/___/____

  Date of last contact with the suspect case ___/___/____
- Did the patient have contact with a **wild animal** (non-human primate or others), that was found deador sick in the bush, or animal behaving abnormally anytime in the three weeks before the illness?

  □ Yes□ No □ DNK; If Yes, kind of animal_____Location_____date____/___/____

Has a sample been collected? □ Yes □ No □ DNK; If yes, date_/_____/___

ϒ Blood sampling □ Urine □ Saliva □ Skin Biopsy

Was the patient sent to a hospital? □ Yes □ No

Was the patient admitted in the isolation ward? □ Yes □ No

If Yes, name of Hospital_____No. de hospital_____Hospitalization date_____/___/

Update on the Hospital information ID Case: _____

Reception date:_____/___/___Country:_____Member of family helping the patient:

_____Name and Surname_____Date of discharge_____/___/___OR Date of death____/___/____

e. Laboratory

A specimen was collected before the death After the death

Date sample_____/___/____ Date results_____/___/____ ID Lab _____

Sample □ blood □ blood with anti-coagulants □ skin biopsy □ cardiac function □ other:

_____

Results PCR □ pos □ neg □ NA date__/__/

Antigen detection □ pos □ neg □ NA date__/__/

Antibodies IgM □ pos □ neg □ NA date_/_/

Antibodies IgG □ pos □ neg □ NA date__/__/

ImmunoHistochemistry □ pos □ neg □ NA date_/_/

Outcome *(verified 4 weeks after the onset of symptoms)*

ϒ Alive □ Dead; If dead, date of death_____/___/____

CASE CLASSIFICATION

□ Alert Case □ Suspect □ Probable □ Confirmed □ Not a case



World Health Organization