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ACUTE FLACCID PARALYSIS

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Poliomyelitis presents with acute flaccid paralysis (AFP). However, there are other causes of AFP including Guillain Barre Syndrome, transverse myelitis, coxsackie virus, traumatic neuritis and echovirus. Therefore, all cases of AFP should be investigated to ensure that they are not caused by polio. Surveillance for (AFP) is the means by which polio eradication will be achieved.	The health care practitioner making the clinical diagnosis should notify the case as soon as the diagnosis is suspected.	Any child under 15 years of age with acute flaccid paralysis, or sudden onset of weakness or paralysis not caused by injury OR Any person of any age who presents with paralytic illness if polio is suspected Acute: rapid progression of paralysis Flaccid: loss of muscle tone or 'floppy', (as opposed to spastic or rigid) Paralysis: weakness, loss of ability to move	[1]None	None

Additional notes

All cases of AFP should be properly investigated for polio. Therefore, the notifying clinician should also complete an AFP case investigation form (CIF) and submit two stool specimens 24-48 hours apart on ice, with a completed laboratory specimen request form. The stool specimens should arrive in the laboratory within 72 hours after collection.

Additional resources

Acute flaccid paralysis case investigation form (CIF) and stool specimen collection guide http://www.nicd.ac.za/assets/files/AFP_CIF_and_Specimen_Collection_Guide.pdf
EPI manual http://www.nicd.ac.za/diseases-a-z-index/acute-flaccid-paralysis-afp/
NICD Frequently Asked Questions document http://www.nicd.ac.za/diseases-a-z-index/acute-flaccid-paralysis-afp/

[1]AFP is a clinical syndrome with many causes. Each case must be investigated to be sure that the cause is not polio

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ACUTE RHEUMATIC FEVER

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Acute rheumatic fever (ARF) is an important cause of heart valve damage, and leads to morbidity and mortality due to heart failure and other complications, especially among economically disadvantaged populations all over the world. The exact burden of ARF in South Africa is unknown. Monitoring of the disease burden is essential to plan prevention and care services.	The diagnosis of ARF is usually made by paediatricians or cardiologists <u>following clinical examination and investigations</u> including echocardiography, ECG, and blood tests including anti-streptococcal antibody tests, C-reactive protein and erythrocyte sedimentation rate. There are no laboratory tests to confirm the diagnosis. A case of ARF should be notified as soon as the clinician is satisfied that the case meets the case definition.	Refer to probable case definition	Any person in whom a clinician suspects acute rheumatic fever.	A primary episode of acute rheumatic fever is made with evidence of **two major, or 1 major+2 minor** manifestations **plus** evidence of a preceding group A streptococcal infection. <u>Major manifestations:</u> Carditis (clinical or subclinical), arthritis (monoarthritis or polyarthritis), polyarthralgia, chorea, erythema marginatum, subcutaneous nodules. <u>Minor manifestations</u>: Clinical signs (fever[≥38°C], monoarthralgia), laboratory signs (ESR ≥30 mm/h [peak values] and/or CRP ≥3.0 mg/dL [> upper limit of normal for laboratory]), prolonged PR interval (after accounting for age variability and unless carditis is a major criterion). <u>Supporting evidence of streptococcal infection</u> A positive throat culture, a rapid antigen test for group A strep, recent scarlet fever, an elevated or rising antistreptolysin-O or other antistreptococcal antibody or prolonged PP-R interval on ECG.
Additional notes				
Additional resources A case investigation form is available at : http://www.nicd.ac.za/diseases-a-z-index/acute-rheumatic-fever/				

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ANTHRAX

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Anthrax is a serious infection usually transmitted from animals, or following ingestion of or wound contamination with anthrax spores. The condition is preventable through antibiotic prophylaxis and eradication of the source. The condition is fatal unless treated intensively and early by means of antibiotics. Anthrax is found throughout South Africa but more frequently in the Northern Cape and northern Kruger National Park (Limpopo). The condition is notifiable because prompt action can prevent additional cases. The organism also has potential for use as a bioweapon.	The clinician who suspects a case should notify the case based on the clinical case definition, as soon as the disease is suspected.	A person with an appropriate epidemiological exposure (e.g. occupational contact with ruminants that have died recently, or animal products such as skins, or contact with anthrax spore-contaminated soil, or ingestion of undercooked, contaminated or raw meat), or history of injection drug abuse, and any of the following • A mild or extensive skin lesion evolving over 1-6 days from a papular/vesicular appearance to a depressed black eschar, usually accompanied by oedema, fever, malaise and lymphadenopathy OR • Nausea, vomiting and anorexia followed by fever, vomiting of blood, bloody diarrhoea OR • Rapid onset of hypoxia, shortness of breath and high temperature, with radiological evidence of mediastinal widening or pleural effusion OR • Acute onset of high fever, convulsions, loss of consciousness and meningeal signs and symptoms	A suspected case with Gram-positive bacilli, square-ended, in pairs or short chains cultured from clinical specimens	A clinically compatible case that is laboratory-confirmed by: • Isolation of *Bacillus anthracis* from clinical specimen; **OR** • Other laboratory evidence of *Bacillus anthracis* infection based on at least two supportive laboratory tests.

Additional notes

Clinicians who suspect anthrax should contact the NICD 24-hour hotline (082-883-9920) for assistance with specimen collection and diagnosis. When a case of anthrax is suspected, a case investigation form should be completed. When bioterrorism is suspected, the South African Police Service should be notified.

Additional resources

A Frequently Asked questions document on anthrax is available at https://www.nicd.ac.za/diseases-a-z-index/anthrax/
The Healthcare workers handbook on bioterrorism (2011) is available at https://www.nicd.ac.za/diseases-a-z-index/anthrax/

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BOTULISM

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Botulism is a rare but serious paralytic illness caused by a nerve toxin that is produced by the bacterium *Clostridium botulinum*. Botulism may be foodborne (18 to 36 hours after eating a contaminated food, or associated with contaminated wounds. Injection-drug users and infants are groups more at risk for botulism. Surveillance and rapid notification will allow for early identification of contaminated foodstuffs and prevention of other cases in the case of foodborne disease.	The health care worker who suspects botulism should notify the case as soon as possible	A person who presents with rapidly progressive (usually descending) symmetric muscle weakness, with any of double vision, blurred vision, bulbar paralysis or weakness, ptosis, slurred speech **AND** having relevant epidemiological exposure (ingestion of foods contaminated with botulinum toxin or *Clostridium botulinum* contaminated wound with in situ toxin production).	A person with clinically compatible illness with an epidemiologic link to other suspected/confirmed cases or food	A confirmed case is a person with laboratory evidence of *Clostridium botulinum* infection by • Culture isolation of *Clostridium botulinum* from clinical specimens, wound or suspected food; **OR** Detection of *Clostridium botulinum* toxin in clinical specimens or suspected food.

Additional notes

Clinicians who suspect botulism should contact the NICD 24-hour hotline (082-883-9920) for assistance with specimen collection and diagnosis. When a case of botulism is suspected, a case investigation form should be completed. This will provide public health officials with additional data to support case investigation and identification of possible sources of infection.

Additional resources

A Frequently Asked questions document on anthrax is available at http://www.nicd.ac.za/diseases-a-z-index/botulism/
A case investigation form is available at http://www.nicd.ac.za/diseases-a-z-index/botulism/

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CHOLERA

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Cholera is a bacterial disease caused by infection with toxin-producing *Vibio cholerae* O1/O139. The organism is transmitted through contaminated water or food. Cholera spreads rapidly, especially in communities which lack safe water, sanitation and hygiene services. Cholera may be imported by travellers to areas endemic for cholera or experiencing cholera outbreaks. Early notification of suspected cases will ensure that the diagnosis is confirmed early, and that measures are implemented to prevent additional cases.	The healthcare worker who identifies a suspected case should notify health authorities immediately. Healthcare workers should NOT wait for laboratory confirmation before notifying cases.	[2]In an area where the disease is not known to be present, a suspected case is defined as a patient, irrespective of age, with severe dehydration or death from acute watery diarrhoea [3]In an area where there is a cholera outbreak, a suspected case is defined as a patient who develops acute watery diarrhoea, with or without vomiting.	A suspected case with an epidemiologic link to a confirmed cholera case.	A case of cholera is confirmed when toxigenic *Vibrio cholerae* O1 or O139 is isolated from any patient with diarrhoea.

Additional notes

Clinicians who suspect cholera should contact the NICD 24-hour hotline (082-883-9920) for assistance with specimen collection and diagnosis. It is essential to: 1) collect stool specimens from suspected cases using the correct procedures, and 2) to complete a case investigation to provide authorities with information to identify the source of cholera. See resources below.

Additional resources

A case-investigation form (CIF), frequently asked questions document (FAQ), National Department of Health Cholera guideilines 2014, and specimen collection guidelines are available at http://www.nicd.ac.za/diseases-a-z-index/cholera/

[2]NDoH Cholera guidelines 2014

[3]NDoH Cholera guidelines 2014

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CORONAVIRUS DISEASE-2019 (COVID-19)

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the causative virus of coronavirus disease 2019 (COVID-19). WHO has declared a global pandemic. Limited data suggest clinical manifestations of COVID-19 are generally milder in children than adults. However, reports from Europe and North America describe clusters of children and adolescents requiring admission to intensive care with a multisystem inflammatory syndrome (MIS-C). It is essential to report and characterize this syndrome including clinical presentation, risk factors, severity, and outcomes.	The healthcare worker responsible for the patient should notify authorities immediately of a **probable or confirmed case.** Outcome of patient should be updated if status changes following notification.	**Not notifiable** Any person presenting with an acute (≤10 days) respiratory tract infection or other clinical illness compatible with COVID-19 Symptoms include ANY of the following respiratory symptoms: cough, sore throat, shortness of breath, anosmia (loss of sense of smell) or dysgeusia (alteration of the sense of taste), with or without other symptoms (which may include fever, weakness, myalgia, or diarrhoea)	A person of any age positive for SARS-CoV-2 using an **antigen based test**[1] AND that is asymptomatic AND not a close contact[2] of a confirmed case OR A person of any age that has COVID-19 related symptoms (suspected case) AND that is a close contact[2] of a confirmed case OR A person aged 0-19 years meeting the case definition of multisystem inflammatory syndrome in children (MIS-C)[3] AND with positive SARS-CoV-2 antibody or antigen based[1] test or close contact[2] of a confirmed case[2]; but SARS-CoV-2 PCR negative or PCR not done	A person of any age with laboratory confirmation of SARS-CoV-2 infection (using a **PCR-based test**), irrespective of clinical signs and symptoms (includes MIS-C[3] with SARS-CoV-2 PCR positive) OR A person of any age positive for SARS-CoV-2 using an **antigen based test**[1] AND that has COVID-19 related symptoms (suspected case) OR is a close contact[2] of a confirmed case

*Additional notes

[1] Rapid antigen test should be performed within 5 days of symptom onset or within 7 days from time of exposure.
[2] Close contact: A person having had face-to-face contact (≤1 metre) or been in a closed space with a confirmed case for at least 15 minutes. This includes, amongst others, all persons living in the same household as a case, and people working closely in the same environment as a case. Healthcare workers or other people providing direct care for a case, while not wearing recommended personal protective equipment or PPE (e.g., gowns, gloves, N95 respirator, eye protection). A contact in an aircraft sitting within two seats (in any direction) of the case, travel companions or persons providing care, and crew members serving in the section of the aircraft where the case was seated.
[3] MIS-C case definition available at: https://www.nicd.ac.za/diseases-a-z-index/covid-19/covid-19-resources/

Additional resources

Additional resources for COVID-19 including case definitions, FAQs, specimen collection instructions and guidelines may be found at: https://www.nicd.ac.za/diseases-a-z-index/covid-19/covid-19-resources/

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DIPHTHERIA

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Diphtheria is caused by infection with toxin-producing strains of *Corynebacterium diphtheriae* or *C. ulcerans* or *C. pseudotuberculosis* Diphtheria is spread via respiratory droplets or direct contact with infected skin lesions from an infected person. Diphtheria has a high mortality rate. Notification is essential because additional cases can be prevented amongst contacts by early administration of antibiotics. Persons who are fully vaccinated are not at risk of diphtheria.	The clinician who suspects diphtheria should notify the case immediately. Healthcare workers should NOT wait for laboratory confirmation before notifying cases.	A person who presents with an upper-respiratory tract illness characterised by sore throat, low-grade fever AND an adherent membrane of the nose, pharynx, tonsils, or larynx.	A person who presents with an upper-respiratory tract illness characterised by sore throat, low-grade fever AND an adherent membrane of the nose, pharynx, tonsils, or larynx; **OR** a person who has an epidemiological link to a confirmed case, who has respiratory tract symptoms but no membrane; **OR** a person with a skin lesion **AND** *C. diphtheria or C. ulcerans or C. pseudotuberculosis* has been isolated from relevant specimens but toxigenicity status has not been confirmed.	Any person with signs and symptoms consistent with diphtheria (respiratory and/or cutaneous) **AND** a positive culture for or PCR detection of *C. diphtheriae* or *C. ulcerans* or *C. pseudotuberculosis* from a clinical specimen which is confirmed to be *tox* gene positive by PCR or toxin-producing by ELEK testing.

Additional notes

Clinicians who suspect diphtheria should contact the NICD 24-hour hotline (082-883-9920) for assistance with specimen collection and diagnosis. It is essential to: 1) collect a throat swab from suspected cases using the correct procedures, and 2) to complete a case investigation to provide authorities with information to identify contacts and implement prevention measures. See resources below.

Additional resources

A case-investigation form (CIF), frequently asked questions document (FAQ), Guidelines for the management and public health response to diphtheria (2018), and specimen collection guidelines are available at http://www.nicd.ac.za/diseases-a-z-index/diphtheria/

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ENTERIC FEVER (TYPHOID OR PARATYPHOID FEVERS)

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Enteric fever is a disease caused by a bacterial infection with *Salmonella enterica* serotype Typhi (the cause of 'typhoid fever') or *S. enterica* ser.Paratyphi A, B or C (which cause 'paratyphoid fever', a disease clinically indistinguishable from typhoid fever). The disease is transmitted by faeco-oral contact or by the ingestion of contaminated food or water. Notification of enteric fever cases assists public health officials to prevent disease in contacts of cases, and to identify and control the source of infection.	Healthcare workers should notify cases on clinical suspicion or on confirmation of the diagnosis by the laboratory.	A person presenting with a fever for at least three out of seven consecutive days and suggestive symptoms, includingGastrointestinal symptoms (abdominal pain, nausea and vomiting, diarrhoea (more common in young children) or constipation (more common in older children and adults)), • Headache • Malaise **AND** • travel within the last month to an area known to be endemic for enteric fever, or where an outbreak of enteric fever is ongoing OR • the absence of an alternate diagnosis in persons with no travel history	A clinically compatible case that is epidemiologically linked to a confirmed case	The isolation of *Salmonella enterica* ser. Typhi, or S. *enterica* ser. Paratyphi A, B or C from a clinical specimen in the presence of symptoms compatible with enteric fever. **Note: serological tests including the Widal test have poor sensitivity and specificity and should <u>not</u> be used to make the diagnosis of enteric fever.**

Additional notes

- Following confirmation of the diagnosis and completion of antimicrobial treatment, the patient must be followed up and serial stool cultures performed to ensure that they have cleared the infection and are not carriers.
- Public health officials should identify household contacts of confirmed cases and obtain stool specimens or rectal swabs to identify and treat contacts who are carriers.

Additional resources

The following resources are available on the NICD website: a frequently-asked questions (FAQ) document, a case investigation form (CIF), diagnosis and treatment guidelines http://www.nicd.ac.za/diseases-a-z-index/typhoid-fever/.

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FOODBORNE ILLNESS OUTBREAK

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Confirmed case definition
Early identification of foodborne illness outbreaks will allow authorities to investigate the outbreak timeously, collect appropriate specimens, identify the outbreak source/s and implement interventions toprevent additional cases.	The healthcare worker who makes the diagnosis should • notify the outbreak by completing a NMC notification form **for the index case only** • submit a complete linelist of affected persons to the responsible communicable disease control co-ordinator AND to the responsible environmental health practitioner AND to the NICD.	An incident in which two or more persons experience a similar illness (gastrointestinal) and are epidemiologically linked	[4]None

Additional notes

- It is not necessary to complete a NMC notification form for every single person affected by the foodborne illness outbreak. However, a line list (see resources below) should be submitted with names and demographic details of all affected persons.
- Stool and/or vomitus specimens, and food/environmental specimens should be submitted to NHLS public health laboratories. See contact details for these labs in resources below.
- A complete investigation of a foodborne illness outbreak requires additional data and results –including results of laboratory testing of clinical and food specimens, symptoms and clinical features of affected persons, the menu and list of foods offered at the implicated meal/s, complete food consumption history from affected AND non-affected persons, and investigation of foodhandlers. The Centre for Enteric Diseases at NICD provides assistance with outbreak investigations.

Additional resources

The NICD-NHLS quick reference guide for the investigation of food borne disease outbreaks (2012), line list (2012), case investigation form (CIF), and specimen submission forms for NHLS public health laboratories in Durban and Johannesburgare available at http://www.nicd.ac.za/diseases-a-z-index/foodborne-illness-and-gastroenteritis-outbreaks/

[4]The identification of a foodborne illness outbreak is a clinical and epidemiological diagnosis. No laboratory confirmation is required.

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HAEMOLYTIC URAEMIC SYNDROME (HUS)

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Confirmed case definition
Haemolytic uraemic syndrome (HUS) is characterised by the acute onset of microangiopathic haemolytic anemia, renal injury, and low platelet count. Most cases of HUS occur after an acute gastrointestinal illness (usually characterised by diarrhoea).	The diagnosis of HUS is usually made by clinicians following clinical examination and laboratory investigations including full blood count and smear microscopy, urine examination, and renal function tests. There is no single laboratory test to confirm the diagnosis. A case of HUS should be notified as soon as the clinician is satisfied that the case definition is met.	None	The presence of: • Haemolytic mechanical anaemia (acute onset) with microangiopathic changes (i.e., schistocytes, burr cells, or helmet cells) on peripheral blood smear, • Thrombocytopenia **AND** • Renal injury (acute onset) evidenced by either haematuria, proteinuria, or elevated creatinine level

Additional notes

Most diarrhea-associated HUS is caused by Shiga toxin-producing *Escherichia coli* (STEC), most commonly *E. coli* O157. HUS usually occurs within three weeks after diarrhoeal illness. Persons with HUS may give a history of bloody diarrhoea. Stool culture and PCR for STEC (performed at CED, NICD) should be done for all cases of suspected HUS.

Additional resources

Contact the Centre for Enteric Diseases at the NICD for additional support regarding haemolytic uraemic syndrome (junot@nicd.ac.za)

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LISTERIOSIS

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Confirmed case definition
Listeriosis is a foodborne illness which has been linked to a range of contaminated foods, including ready-to-eat meats, dairy products and fresh produce. Listeriosis may result in bacteraemia, meningitis, and foetal loss (miscarriage) in pregnant women. Immunocompromised persons, pregnant women, and the elderly are more at risk of developing disease. Cases of listeriosis must be notified and investigated so that potential outbreaks and possible source/s are identified timeously.	The clinician responsible for treating a patient should notify authorities as soon as the diagnosis is confirmedby the laboratory. Laboratorians should also notify authorities when the diagnosis is made. There is no clinical case definition.	[5]None	The isolation by culture or detection by PCR of *Listeria monocytogenes* in any clinical specimen

Additional notes

Laboratories should submit all isolates of *Listeria monocytogenes* to the NICD Centre for Enteric Diseases for molecular typing. A detailed food history should be obtained using the listeriosis case investigation form (see below) from all persons with listeriosis, or their next of kin, or the mother, if fetal loss occurs.

Additional resources

The following resources are available at http://www.nicd.ac.za/diseases-a-z-index/listeriosis/ A Frequently asked questions (FAQ) document, a guide to the laboratory diagnosis of listeria, a case investigation form (CIF), a CIF instruction sheet, and a food/environmental specimen request form.
Contact the Centre for Enteric Diseases at the NICD for additional support regarding listeriosis (junot@nicd.ac.za)

[5] Listeriosis may present with a wide range of symptoms and nonspecific clinical syndromes.. Therefore there is no clinical case definition.

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MALARIA

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Systemic febrile infection caused by five species of mosquito-transmitted protozoal parasites, generally acquired in known risk areas, but occasionally associated with blood transfusions, needle injuries, and imported mosquitoes in non-endemic areas. Notification of cases is essential to track disease burden in endemic provinces, and to investigate the reason for imported cases in non-endemic areas.	Healthcare practitioner who makes the diagnosis should notify the case immediately following • A positive rapid (bedside) test for malaria • A positive test from a blood specimen submitted to a laboratory.	In an endemic area, an acute febrile flu-like illness (AFFI) in a person with a history of exposure; OR In a non-endemic area, an AFFI with a history of blood transfusion or injections, or AFFI with no other cause for illness and compatible non-specific laboratory findings, especially thrombocytopenia.	Clinically suspected case in a recognized malaria outbreak or endemic area.	Positive malaria test (blood smear, rapid antigen, PCR) for any of the species: *P. falciparum, P. vivax, P. ovale, P. malariae, P. knowlesi.*

Additional notes

In endemic areas, malaria cases should be notified by completion of the NMC paper form, and submitted to the provincial malaria control programme officials. Malaria control programme officials will then investigate each case according to current procedures.
In non-endemic areas, malaria cases should be notified on the NMC app, or on paper by completion of the NMC form. Where cases do not report a travel history, an entomological assessment of the house and geographical location of residence should be conducted by environmental health officials so as to find mosquito breeding sites and kill possible *Plasmodium* species larvae

Additional resources

The following resources are available at https://www.nicd.ac.za/diseases-a-z-index/malaria/ A Frequently asked questions (FAQ) document, a malaria risk map (December 2018), South African guidelines for treatment and prevention of malaria, surveillance guidelines for malaria elimination and prevention of re-introduction for south Africa (2012).

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MEASLES

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Measles is a highly infectious viral disease transmitted by the respiratory route. Measles presents with fever, rash and any of cough, conjunctivitis and runny nose. Measles infectivitiy is greatest in the 4 days before until 4 days after the rash onset. WHO defines a measles outbreak as two or more laboratory-confirmed cases that are temporally related (with dates of rash onset occurring 7–23 days apart) and epidemiologically- or virologically linked, or both. Early notification of measles is essential to allow authorities to conduct ring vaccination to prevent spread of cases.	Any clinician who suspects a measles case should notify the case immediately.	Any person in whom a clinician suspects measles infection **OR** any person with fever and maculopapular rash (i.e. non-vesicular) and one of cough, coryza (i.e. runny nose) or conjunctivitis (i.e. red eyes).	Suspected measles case with epi link to a known measles case	A laboratory-confirmed measles case is any person with clinically compatible measles and a measles-specific IgM result in any specimen **or** a positive measles PCR test on a throat swab. . A clinically compatible case according to the WHO is a case that meets the clinical case definition with no blood specimen submitted, or without an epidemiological link to a confirmed case.

Additional notes

- All suspected measles cases (SMC) should have a case investigation form (CIF) completed (see resources below), and a blood specimen submitted for measles-specific IgM testing within 28 days of symptom onset. A throat specimen for measles-specific PCR should be submitted if the patient presents within one week of symptom onset.
- All SMCs are reviewed by the NICD and NDoH where a final classification is determined. Cases may be classified as confirmed, probable or clinically compatible, or may be discarded (IgM -ve or vaccine-associated) according to WHO criteria*

Additional resources

- The following resources are available at http://www.nicd.ac.za/diseases-a-z-index/measles/ A Frequently asked questions (FAQ) document, a measles vaccine FAQ, a measles case investigation form (CIF), a measles campaign FAQ for public and private sector, and guidelines for measles management from the Expanded Programme of Immunisation Manual (2015).

*https://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/measles_standards/en/#:~:text=Clinical%20case%20definition,or%20conjunctivitis%20(i.e.%20red%20eyes)

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MENINGOCOCCAL DISEASE

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Meningococcal disease is caused by *Neisseria meningitidis*. It can present as meningitis, septicaemia, respiratory or focal infections. It is spread through droplets or intimate contact with nasopharyngeal secretions. The incubation period of meningococcal disease is 3 to 5 days Meningococcal disease should be notified, as additional cases can be prevented by giving chemoprophylaxis (antibiotics) to persons who have been in contact with cases.	Any clinician who suspects a case of meningococcal disease should notify the case immediately before laboratory results are available. Health authorities should identify contacts and administer prophylactic antibiotics as soon as possible before laboratory confirmation is available.	A clinical diagnosis of meningitis, septicaemia or other invasive disease (e.g. orbital cellulitis, septic arthritis) where the physician considers that meningococcal disease is the most likely diagnosis. Cases may present with fever, petechial rash and may progress rapidly to purpura fulminans, shock, and death.	A suspected case is regarded as a probable case.	The isolation of *N. meningitidis* from a normally sterile site specimen (e.g., blood; cerebrospinal, pericardial or synovial fluid), or a positive Gram's stain and latex result, or a positive PCR result. Although not meeting the case definition, meningococcal conjunctivitis is considered an indication for public health action because of the high immediate risk of invasive disease.

Additional notes

The NICD Centre for Respiratory Disease and Meningitis (CRDM) is able to conduct PCR for meningococcal disease and other pathogens in cases of unexplained death where meningococcal disease or other infectious agent is suspected. Post-mortem specimens may be submitted to the CRDM. For further information or assistance please contact annev@nicd.ac.za

Additional resources

The following resources are available at http://www.nicd.ac.za/diseases-a-z-index/meningoccocal-disease/ A Frequently asked questions (FAQ) document, an update for healthcare workers (april 2019), a specimen submission form.

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MULTISYSTEM INFLAMMATORY SYNDROME (MIS-C)

Why is surveillance necessary?	Who must notify and	Suspected case	Probable case definition	Confirmed case definition
On the 31st December 2019, the World Health Organization (WHO) China country office reported a cluster of pneumonia cases in Wuhan City, Hubei Province of China now known to be caused by a novel virus. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has been confirmed as the causative virus of coronavirus disease 2019. WHO has declared a global pandemic. Limited data suggest clinical manifestations of COVID-19 are generally milder in children than adults. However, reports from Europe and North America describe clusters of children and adolescents requiring admission to intensive care with a multisystem inflammatory syndrome (MIS-C). It is essential to report and characterize this syndrome including clinical presentation, risk factors, severity, and outcomes.	The healthcare worker responsible for the patient should notify authorities immediately of a **probable or confirmed case.** Outcome of patient should be updated if status changes following notification.	Not notifiable	A person aged 0-19 years meeting the World Health Organization (WHO) case definition of multisystem inflammatory syndrome in children (MIS-C)* **WITH** **No confirmed contact with COVID-19 patient, negative SARS-CoV2 PCR or no available SARS-CoV2 antibody test result AND likely community exposure.**	A person aged 0-19 years meeting the World Health Organization (WHO) case definition of multisystem inflammatory syndrome in children (MIS-C)*

***Additional notes**

WHO case definition of multisystem inflammatory syndrome in children (MIS-C) All 6 criteria must be met:

1. Age 0 to 19 years
2. Fever for ≥3 days
3. Clinical signs of multisystem involvement (**at least 2** of the following):
   - Rash, bilateral nonpurulent conjunctivitis, or mucocutaneous inflammation signs (oral, hands, or feet),
   - Hypotension or shock,
   - Cardiac dysfunction, pericarditis, valvulitis, or coronary abnormalities (including echocardiographic findings or elevated troponin/BNP),
   - Evidence of coagulopathy (prolonged PT or PTT; elevated D-dimer),
   - Acute gastrointestinal symptoms (diarrhea, vomiting, or abdominal pain
4. Elevated markers of inflammation (eg, ESR, CRP, or procalcitonin)
5. No other obvious microbial cause of inflammation, including bacterial sepsis and staphylococcal/streptococcal toxic shock syndromes
6. Evidence of SARS-CoV-2 infection **(any** of the following):
   - Positive SARS-CoV-2 RT-PCR (reverse transcription real-time PCR);
   - Positive antibody test;
   - Positive antigen test;
   - Likely contact with an individual with COVID-19

Additional resources

Additional resources for COVID-19 including case definitions, FAQs, specimen collection instructions and guidelines may be found at: http://www.nicd.ac.za/diseases-a-z-index/covid-19/

Category 1: Immediate reporting telephonically followed by written or electronic notification within 24hrs of diagnosing a case

PERTUSSIS

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Pertussis or 'whooping cough' is a highly contagious bacterial respiratory tract disease, caused by *Bordetella pertussis.* It occurs mainly in infants and young children and is transmitted through respiratory secretions. Pertussis is notifiable because it is transmissible, and carries a high mortality in children under the age of 1 year, especially children too young to be vaccinated or who have not yet completed their primary vaccination series. Pertussis may be prevented in contacts by giving chemoprophylaxis.	Clinicians should notify cases of pertussis on the basis of clinical suspicion. Clinicans should not wait for laboratory confirmation before notifying.	Any person with an acute cough illness lasting ≥14 days (or cough illness of any duration for children <1 year), without a more likely diagnosis AND one or more of the following signs or symptoms: • paroxysms of coughing, • or inspiratory "whoop", • or post-tussive vomiting • or apnoea in children <1 year; OR Any person in whom a clinician suspects pertussis.	Any person meeting the clinical case definition **AND** An epidemiologic linkage to a laboratory-confirmed case of pertussis in the 21 days before symptom onset.	Any person meeting the clinical case definition **AND** Isolation *of B. pertussis* from a clinical respiratory specimen OR polymerase chain reaction positive for pertussis OR specific antibody response (anti-pertussis toxin IgG response in older children and adults, and ≥1 year after last vaccine dose. Interpret with caution in younger children).

Additional notes

Health authorities should identify contacts of pertussis cases and provide post exposure prophylaxis and if necessary, booster vaccination. Health care workers should receive booster vaccination to prevent transmission of cases in hospital settings.

Additional resources

Additional resources for pertussis including pertussis preparedness for clinicians (2018), FAQ, guidelines for post-exposure prophylaxis following a single case (2011) and specimen submission form to NICD Centre for Respiratory Disease and Meningitis (CRDM), may be found at http://www.nicd.ac.za/diseases-a-z-index/pertussis/

Category 1: Immediate reporting telephonically followed by written or electronic notification within 24hrs of diagnosing a case

PLAGUE

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Plague is caused by the bacterium *Yersinia pestis*. Humans usually get plague after exposure to saliva or feces of fleas that are carrying the plague bacterium or by handling an animal infected with plague. The last human cases of plague in South Africa were in 1982. Plague is notifiable because it is rapidly fatal (with a 90-95% case fatality rate) and has potential for person-to-person spread through respiratory droplets. Bubonic plague presents with swollen painful lymph nodes in the groin or neck and has a lower mortality, but may spread locally to become septicaemic or pneumonic.	The clinician who suspects the diagnosis should notifiy authorities and the NICD immediately on clinical suspicion. Post-exposure prophylaxis with antibiotics may be administered to contacts of persons with confirmed plague	A person with exposure in a compatible epidemiological scenario, with fever, chills, headache, malaise, prostration, a raised white cell count and any of • regional lymphadenitis in the groin, armpit or neck • septicemia without an evident bubo • pneumonia. **OR** clinical compatible case with clinical specimens that contain Gram-negative coccobacilli that exhibit bipolar-staining with Wayson or Wright's Giemsa stains	A person with clinically compatible illness with • a positive result with immunofluorescence or other validated assay; **OR** • a single serum specimen positive for anti-F1 antibody by ELISA; **OR** • an epidemiological link to a confirmed case.	A clinically compatible case that is laboratory-confirmed by: • Culture Isolation of *Yersinia pestis* from clinical specimens; **OR** • IgG seroconversion in a serum specimen from a clinically compatible case; **OR** A ≥4-fold rise in titre of anti-F1 antibody level over 2 weeks in a serum specimen from a clinically compatible case

Additional notes

Clinicians who suspect plague should contact the NICD 24-hour hotline (082-883-9920) for assistance with specimen collection and diagnosis.

Additional resources

A frequently-asked questions document is available at https://www.nicd.ac.za/plague-frequently-asked-questions-2/.

Category 1: Immediate reporting telephonically followed by written or electronic notification within 24hrs of diagnosing a case

POLIOMYELITIS

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Poliomyelitis is a potentially deadly infectious disease caused by the poliovirus. The virus spreads from person to person and invades an infected person's brain and spinal cord, causing paralysis. Poliovirus is notifiable because it is targeted for eradication. Surveillance for acute flaccid paralysis is the means by which countries detect the presence of polio. To date, poliovirus remains endemic only in Afganistan, Nigeria and Pakistan.	All clinicians who identify cases of acute flaccid paralysis should notify these, and submit a completed AFP case investigation form, and two stool specimens to the NICD.	Any child under 15 years of age with acute flaccid paralysis, or sudden onset of weakness or paralysis not caused by injury OR Any person of any age who presents with paralytic illness if polio is suspected Acute: rapid progression of paralysis Flaccid: loss of muscle tone or 'floppy', (as opposed to spastic or rigid) Paralysis: weakenss, loss of ability to move	N/A	Laboratory confirmation of any of the following from a stool or cerebrospinal fluid sample: • wildtype poliovirus OR • vaccine derived polio virus (VDPV) OR • Sabin polio virus

Additional notes

Clinicians who suspect polio should follow the procedure for notification and identification of acute flaccid paralysis (see notes on AFP in this document). The clinician should notify the cases and complete an AFP case investigation form (CIF) and submit two stool specimens on ice, with a completed laboratory specimen request form. The stool specimens should arrive in the laboratory within 48 hours after collection.

Additional resources

A frequently-asked questions document, and the national polio outbreak preparedness and respons plan is available at http://www.nicd.ac.za/diseases-a-z-index/poliomyelitis/. Resources for acute flaccid paralysis are found at http://www.nicd.ac.za/diseases-a-z-index/acute-flaccid-paralysis-afp/

Category 1: Immediate reporting telephonically followed by written or electronic notification within 24hrs of diagnosing a case

RABIES (HUMAN)

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Rabies virus is transmitted through the saliva of infected mammals including dogs, mongoose, cats, jackal, cattle and goats. After a variable incubation period (2 weeks to years), the rabies virus causes dysfunction of the nervous system resulting in encephalitis, coma and death. There is no treatment but rabies post-exposure prophylaxis may prevent cases in persons who have been exposed. Cases of rabies should be notified, as canine rabies is endemic in South Africa, and human exposures are frequent. Following notification of a case, investigations should ensure to determine why post exposure prophylaxis was not correctly administered, and identify additional persons at risk. Veterinary control measures should also be implemented.	The clinician who suspects the diagnosis should notify the case as soon as it meets the clinical case definition. Laboratory confirmation is not required before notification of the case.	A person presenting with an acute neurological syndrome (encephalitis) dominated by forms of hyperactivity (furious rabies) or paralytic syndromes (dumb rabies) progressing towards coma and death, usually by respiratory failure, within 7-10 days after the first symptom if no intensive care is instituted.	A probable case is a suspected case WITH a likely exposure to a suspected rabid animal.	A confirmed case is a person with laboratory evidence of rabies infection by detection of a. Rabies virus nucleic acid by RT-PCR on saliva, skin biopsy or cerebrospinal fluid (CSF) **OR** b. Anti-rabies antibodies in CSF (ante-mortem); **OR** c. Rabies virus antigen in brain tissue by fluorescent antibody testing or rabies virus nucleic acid in skin biopsy (post mortem).

Additional notes

Negative saliva tests for raies do not rule out the diagnosis. If the diagnosis is not confirmed through laboratory tests done ante-mortem, a post-mortem brain biopsy should be done. Instructions for specimen collection are found on the NICD website (see below). Human rabies statistics are based on year of exposure and infection and may differ from year of case notification.

Additional resources

Additional resources for rabies including instructions for specimen collection, rabies prevention guidelines, a rabies FAQ, may be found at https://www.nicd.ac.za/diseases-a-z-index/rabies/

Category 1: Immediate reporting telephonically followed by written or electronic notification within 24hrs of diagnosing a case

RESPIRATORY DISEASE CAUSED BY A NOVEL RESPIRATORY PATHOGEN

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Previously unrecognised/ undetected pathogens may be responsible for outbreaks of disease in humans. Novel respiratory pathogens emerge occasionally, and cause outbreaks. Examples of this are the SARS outbreak that occurred in 2003 in South East Asia, and the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) outbreak currently ongoing in the Middle East and SARS-CoV-2 first identified in China in 2019. These pathogens may first be identified as a cluster of people with severe respiratory illness. This category of disease is notifiable in the unusual event of an outbreak of a previously unrecognised/undetected pathogen, or the importation of a pathogen not currently included in the NMC regulations.	The healthcare practitioner responsible for the patient or who has noted a cluster of cases of respiratory illness should notify authorities. Notification should be made immediately on identification of the cluster, or on receipt of a laboratory diagnosis of the novel respiratory pathogen.	A person meeting the case definition for a suspected case of a specific emerging respiratory pathogen e.g., MERS-CoV (see NICD website for specific updated case definitions for emerging pathogens)* **OR** A cluster (e.g. 3 or more cases in 72 hours, or 5 or more cases in a 5-day period) of people with severe respiratory illness (hospitalised or warranting hospitalisation or ICU admission or death) with evidence of common exposure or epidemiologic link. Attention should be given to recent travel or exposure to animals implicated in zoonotic transmission of respiratory pathogens.	A person meeting the case definition for a probable case of a specific emerging respiratory pathogen e.g. MERS-CoV (see NICD website for specific updated case definitions for emerging pathogens); **OR** Person/s (single or from a cluster) satisfying the suspected case definition, with absent or inconclusive laboratory result for a novel or emerging pathogen; **AND** A close contact of a laboratory-confirmed case.	A person with laboratory confirmation of a novel (new), emerging pathogen (not previously detected in South Africa) e.g., MERS-CoV or avian influenza A subtypes (e.g. H5N1, H7N9).

Additional notes

In the event of an outbreak of a novel respiratory pathogen, the NICD will make and confirm the initial diagnosis, and will issue case definitions and laboratory criteria for diagnosis. Influenza H1N1pdm09 (known in the public media as 'swine flu') is NOT a novel respiratory pathogen, and is NOT notifiable

***Additional resources**

Additional resources for MERS-CoV, including a FAQ, specimen collection instructions and guidelines may be found at http://www.nicd.ac.za/diseases-a-z-index/middle-east-respiratory-syndrome-coronavirus/

Category 1: Immediate reporting telephonically followed by written or electronic notification within 24hrs of diagnosing a case

RIFT VALLEY FEVER (HUMAN)

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Rift Valley fever (RVF) is a viral disease affecting domesticated ruminant animals and humans. It is transmitted by *Culex* and *Aedes* spp. mosquitoes or by direct contact with animal blood and/or body fluids. There is no antiviral treatment for RVF. Clinical presentation ranges from mild to fatal. RVF is notifiable as disease in humans often following or accompanies epizootics (outbreaks in animals). Notification will allow authorities to implement appropriate health promotion and prevention interventions including vaccination of animals.	The healthcare practitioner who suspects the diagnosis or who receives a diagnosis following laboratory tests on the case should notify the case.	A person with acute onset of fever > 38°C with at least one of the following symptoms: headache, loss of appetite, vomiting, diarrhoea, abdominal pain; and any of the following: • ALT, AST or γ-GT level elevation (3 times above normal), clinical jaundice, hepatitis; OR • features of encephalitis, such as confusion, disorientation, drowsiness, coma, neck stiffness, hemiparesis, paraparesis, or convulsions; OR • bleeding into skin (ecchymosis, purpura, petechiae), vomiting of blood, blood in stool, or bleeding from rectum, nose, puncture sites or vagina, decreased platelets count; OR • retinitis, unexplained acute vision loss or blind spots (scotomas); OR • unexplicable sudden death with a history of fever, lethargy, diarrhoea, abdominal pain, nausea, vomiting, or headache in the preceding 2 weeks **AND** Any of the following epidemiological exposures: • a recent close contact with hoofed livestock and game animals in or from RVF-affected areas*, including slaughtering and butchering (traditional or commercial), disposal of carcasses and foetuses, assisting with birthing or other animal husbandry activities that resulted in exposure to animal blood and body fluids, or veterinary procedures and necropsies; OR • History of recent mosquito bites and residing in RVF affected areas*; OR • consuming unpasteurized milk from RVF-affected areas*.	A probable case is a suspected case with laboratory IgM antibodies against RVF virus.	A confirmed case is a person with laboratory evidence of RVF virus infection by • PCR positive and virus isolation from the patient's first (single) specimen; OR • PCR positive and IgM positive result on patient's first (single) specimen; OR • PCR positive on two separate specimens from the same patient collected at least one day apart; OR • PCR positive but IgM/IgG negative result in patient's first specimen and PCR negative but IgM/IgG positive result in patient's second specimen collected at least one day apart; OR • Increase in IgM/IgG titres between acute and convalescent specimens.

Additional notes

Clinicians who suspect plague should contact the NICD 24-hour hotline (082-883-9920) for assistance with specimen collection and diagnosis.

Additional resources

Additional resources for RVF including a healthcare workers handbook and case investigation form

*map of historical outbreak areas in South Africa may be found at https://www.nicd.ac.za/diseases-a-z-index/rift-valley-fever/

Category 1: Immediate reporting telephonically followed by written or electronic notification within 24hrs of diagnosing a case

SMALLPOX

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Smallpox is an acute contagious disease caused by the variola virus, a member of the orthopoxvirus family. It was declared eradicated in 1980 following a global immunization campaign led by the World Health Organization.	The healthcare practitioner who makes the diagnosis should notify the case	A person with acute onset of fever ≥38.3°C and malaise, and severe prostration with headache and backache occurring 2 to 4 days before rash onset AND subsequent development of a maculopapular rash starting on the face and forearms, then spreading to the trunk and legs, and evolving within 48 hours to deep-seated, firm/hard and round well-circumscribed vesicles and later pustules, which may become umbilicated or confluent AND lesions that appear in the same stage of development (i.e. all are vesicles or all are pustules) on any given part of the body (e.g. the face or arm) AND no alternative diagnosis explaining the illness.	A probable case is a suspected case with either laboratory evidence by • Detection of a poxvirus resembling variola virus by electron microscopy; OR • Isolation of variola virus pending confirmation; OR • Detection of variola virus by nucleic acid testing pending confirmation); ORF • epidemiological linked to confirmed case).	A confirmed case is a person with laboratory evidence of smallpox virus infection by • Isolation of variola virus and PCR confirmation of cultured isolate; OR • Detection of variola virus by PCR).
Additional notes In the past, smallpox was sometimes confused with chickenpox, caused by varicella zoster virus. Chickenpox can be distinguished from smallpox by its much more superficial lesions, their presence more on the trunk than on the face and extremities, and by the development of successive crops of lesions in the same area.				
Additional resources Smallpox is not likely every to occur in South Africa, but should clinicians be concerned, they should contact the NICD 24-hour hotline (082-883-9920) for assistance with the diagnosis.				

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VIRAL HAEMORRHAGIC FEVER DISEASES : EBOLA

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
"Ebola is a hemorrhagic fever (EVD) is a severe febrile illness characterized by sudden onset of fever, and non-specific symptoms with rapid progression to bleading and death. EVD is caused by a filovirus. Large EVD outbreaks in Central and West Africa have occurred in the last 10 years. A single imported case of EVD was documented in 1996 in a Gabonese doctor, who transmitted the disease to the South African nurse who was caring for him. EVD is notifiable because it is easily transmissible from person to person and has outbreak potential. After notification of a case, public health officials will request all contacts of the case to monitor themselves for fever and compatible symptoms for a 21-day period following exposure.	The health care practitioner who suspects EVD and requests laboratory testing should notify the case. The laboratory that diagnoses the condition should also notify the case	A person with sudden onset of fever > 38.5°C with at least three of the following signs and symptoms: • headaches, lethargy, myalgia, or • abdominal pain, vomiting, anorexia, loss of appetite, diarrhoea, difficulty in swallowing, hiccups, bloody diarrhoea, or • bleeding from gums, bleeding into skin (purpura), bleeding into eyes and urine, or • any sudden inexplicable death. **AND** a likely epidemiological exposure including any of • contact with a suspected, probable or confirmed Ebola case, or • residence in—or travel to—an outbreak area (as reported on www.nicd.ac.za) within 21 days of illness onset, or • contact with dead or sick animal (bats, rodents, or primates) or • laboratory exposure, or • exposure to semen from a confirmed acute or convalescent case of EVD within the 10 weeks of that person's onset of symptoms).	Any deceased suspected case (where it has not been possible to collect specimens for laboratory confirmation) having an epidemiological link.	Laboratory evidence of Ebola virus infection as evidenced by any of the following • PCR positive and virus isolation from the patient's first (single) specimen • PCR positive and IgM positive result on patient's first (single) specimen; or • PCR positive on two separate specimens from the same patient collected at least one day apart, or • PCR positive but IgM/IgG negative result in patient's first specimen and PCR negative but IgM/IgG positive result in patient's second specimen collected at least one day apart, or • Increase in IgM/IgG titres between acute and convalescent specimens, or • is a suspected case with laboratory suggestive evidence of Ebola virus infection by (IgM positive result on patient's first specimen).

Additional notes

Clinicians suspecting Ebola virus disease should contact the NICD 24-hour hotline (082-883-9920) for assistance with the diagnosis. Clinicians who submit specimens for EVD testing should also complete the case investigation form that is found at https://www.nicd.ac.za/diseases-a-z-index/viral-haemorrhagic-fever-vhf/

Additional resources

The following resources are available at https://www.nicd.ac.za/diseases-a-z-index/ebola-virus-disease/: a frequently-asked questions (FAQ) document, Guidelines for the laboratory investigation of EVD, and the National Guidelines for Recognition and Management of EVD. Clinicians who submit specimens for EVD testing should also complete the case investigation form that is found at https://www.nicd.ac.za/diseases-a-z-index/viral-haemorrhagic-fever-vhf/

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VIRAL HAEMORRHAGIC FEVER DISEASES : MARBURG

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Marburg is a haemorrhagic fever (MHF) caused by a filovirus. Though caused by different viruses, Ebola virus disease (EVD) and MHF are clinically similar. Transmission of MHF is via direct contact with blood and body fluids from infected persons, contact with Rousettus bat colonies, or via infected semen from recovered persons up to seven weeks after recovery. Outbreaks and sporadic cases have been reported from Germany (from laboratory work with monkeys from Uganda), Serbia, Angola, Democratic Republic of the Congo, Kenya, South Africa (in a person with recent travel history to Zimbabwe) and Uganda. MHF is notifiable because it is easily transmissible from person to person and has outbreak potential. After notification of a case, public health officials will request all contacts of the case to monitor themselves for fever and compatible symptoms for a 9-day period following exposure.	The health care practitioner who suspects Marburg and requests laboratory testing should notify the case. The laboratory that diagnoses the condition should also notify the case	A person with sudden onset of fever > 38.5°C with at least three of the following signs and symptoms: • headaches, lethargy, myalgia, or • abdominal pain, vomiting, anorexia, loss of appetite, diarrhoea, difficulty in swallowing, hiccups, bloody diarrhoea, or • bleeding from gums, bleeding into skin (purpura), bleeding into eyes and urine, or • any sudden inexplicable death. **AND** a likely epidemiological exposure including any of • contact with a suspected, probable or confirmed MHF case, or • residence in—or travel to—an endemic area within 9 days of illness onset, or • contact with dead or sick animal (bats, rodents, or primates) or • laboratory exposure, or exposure to semen from a confirmed acute or convalescent case of Marburg within the 10 weeks of that person's onset of symptoms).	Any deceased suspected case (where it has not been possible to collect specimens for laboratory confirmation) having an epidemiological link.	A confirmed case is a person with laboratory evidence of Marburg virus infection as evidenced by • PCR positive and virus isolation from the patient's first (single) specimen, or • PCR positive and IgM positive result on patient's first (single) specimen, or • PCR positive on two separate specimens from the same patient collected at least one day apart, or • PCR positive but IgM/IgG negative result in patient's first specimen and PCR negative but IgM/IgG positive result in patient's second specimen collected at least one day apart, or • Increase in IgM/IgG titres between acute and convalescent specimens, or • is a suspected case with IgM positive result on patient's first specimen.

Additional notes

Clinicians suspecting Marburg haemorrhagic fever should contact the NICD 24-hour hotline (082-883-9920) for assistance with the diagnosis. Clinicians who submit specimens for MHF testing should also complete the case investigation form that is found at https://www.nicd.ac.za/diseases-a-z-index/viral-haemorrhagic-fever-vhf/

Additional resources

Additional resources are available at https://www.nicd.ac.za/diseases-a-z-index/viral-haemorrhagic-fever-vhf/

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VIRAL HAEMORRHAGIC FEVER DISEASES : LASSA FEVER

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Lassa fever (LASF) is a viral hemorraghic fever endemic exclusively to West Africa, caused by a rodent-borne arenavirus. Transmission of LAS virus is believed to occur via exposure to rodent excreta, either from direct inoculation to the mucous membranes or from inhalation of aerosols produced when rodents urinate. Secondary human-to-human transmission via contact with infected blood or bodily fluids, from oral or mucosal exposure may occur. The observed case-fatality rate among patients hospitalized with severe cases of Lassa fever is 15% LASF is notifiable because it is transmissible from person to person and has outbreak potential. After notification of a case, public health officials will request all contacts of the case to monitor themselves for fever and compatible symptoms for a 9-day period following exposure.	The health care practitioner who suspects Lassa feverand requests laboratory testing should notify the case. The laboratory that diagnoses the condition should also notify the case	A person with sudden onset of fever > 38.5°C with at least three of the following signs and symptoms: • headaches, lethargy, myalgia, or • abdominal pain, vomiting, anorexia, loss of appetite, diarrhoea, difficulty in swallowing, hiccups, bloody diarrhoea, or • bleeding from gums, bleeding into skin (purpura), bleeding into eyes and urine, or • any sudden inexplicable death. **AND** a likely epidemiological exposure including any of • contact with a suspected, probable or confirmed LASF case, or • residence in—or travel to—an endemic area within 9 days of illness onset, or • contact with rodents or rodent urine in endemic areas or • laboratory exposure, or • exposure to semen from a confirmed acute or convalescent case of LASF within the 10 weeks of that person's onset of symptoms).	Any deceased suspected case (where it has not been possible to collect specimens for laboratory confirmation) having an epidemiological link.	A confirmed case is a person with laboratory evidence of Marburg virus infection as evidenced by • PCR positive and virus isolation from the patient's first (single) specimen, or • PCR positive and IgM positive result on patient's first (single) specimen, or • PCR positive on two separate specimens from the same patient collected at least one day apart, or • PCR positive but IgM/IgG negative result in patient's first specimen and PCR negative but IgM/IgG positive result in patient's second specimen collected at least one day apart, or • Increase in IgM/IgG titres between acute and convalescent specimens), or • is a suspected case with IgM positive result on patient's first specimen.
Additional notes Clinicians suspecting Lassa fever should contact the NICD 24-hour hotline (082-883-9920) for assistance with the diagnosis. Clinicians who submit specimens for Lassa fever testing should also complete the case investigation form that is found at https://www.nicd.ac.za/diseases-a-z-index/viral-haemorrhagic-fever-vhf/				
Additional resources Additional resources are available at https://www.nicd.ac.za/diseases-a-z-index/viral-haemorrhagic-fever-vhf/				

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VIRAL HAEMORRHAGIC FEVER DISEASES : LUJO

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Lujo (LHF) is a hemorraghic fever caused by an arenavirus. LHF is contracted by humans through contact with virus-contaminated rodent excreta, via inhalation of dust or aerosolized materials or vomitus soiled with rodent feces and urine, or nosocomially via direct contact with infected blood, urine or pharyngeal secretions from an infected person or via ingestion of contaminated food. To date only five cases of LHF have been recognized and laboratory confirmed following a nosocomial outbreak in South Africa in 2008. The index case sought medical care in South Africa following onset of illness in Zambia and subsequently infected four health care workers. LHF is notifiable because it is transmissible from person to person and has outbreak potential. After notification of a case, public health officials will request all contacts of the case to monitor themselves for fever and compatible symptoms for a 21-day period following exposure.	The health care practitioner who suspects Lassa feverand requests laboratory testing should notify the case. The laboratory that diagnoses the condition should also notify the case	A person with acute onset of fever >38.5°C, and at least three of the following signs and symptoms: • severe headache, myalgia, • diarrhea, • pharyngitis, abdominal pain, retrosternal chest pain, respiratory distress, • moderate thrombocytopenia, • increased AST and • leukocytosis, • proteinuria, • neurological signs or • sudden inexplicable death AND a likely epidemiological exposure including any of • contact with a suspected, probable or confirmed Lujo case, or • contact with a dead or sick animal especially rodents within the past 21 days.	Any deceased suspected case (where it has not been possible to collect specimens for laboratory confirmation) having an epidemiological link.	A confirmed case is a person with laboratory evidence of Lujo virus infection as evidenced by • PCR positive and virus isolation from the patient's first (single) specimen, or • PCR positive and IgM positive result on patient's first (single) specimen, or • PCR positive on two separate specimens from the same patient collected at least one day apart, or • PCR positive but IgM/IgG negative result in patient's first specimen and PCR negative but IgM/IgG positive result in patient's second specimen collected at least one day apart, or • Increase in IgM/IgG titres between acute and convalescent specimens, or • is a suspected case with IgM positive result on patient's first specimen.
Additional notes Clinicians suspecting Lujo haemorrhagic fever should contact the NICD 24-hour hotline (082-883-9920) for assistance with the diagnosis. Clinicians who submit specimens for LHF testing should also complete the case investigation form that is found at https://www.nicd.ac.za/diseases-a-z-index/viral-haemorrhagic-fever-vhf/				
Additional resources Additional resources are available at https://www.nicd.ac.za/diseases-a-z-index/viral-haemorrhagic-fever-vhf/				

Category 1: Immediate reporting telephonically followed by written or electronic notification within 24hrs of diagnosing a case

VIRAL HAEMORRHAGIC FEVER DISEASES : CRIMEAN-CONGO

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Congo fever is a viral hemorrhagic fever (CCHF) caused by a nairovirus and is transmitted to humans through the bites or crushing of ticks, by contact with a patient with CCHF during the acute phase of infection or by contact with blood or tissues from viremic livestock. CCHF has a global distribution (Africa, Asia and Eastern Europe) and is the only endemic viral hemorrhagic fever to South Africa, primarily in the inland central plateau and the drier regions of South Africa. The case-fatality rate of CCHF ranges from 3-30%. Persons with occupational or recreational exposure to ticks or animals are at risk of disease. CCHF is notifiable because it is transmissible from person to person and has outbreak potential. After notification of a case, public health officials will request all contacts of the case to monitor themselves for fever and compatible symptoms for a 14-day period following exposure.	The health care practitioner who suspects CCHF and requests laboratory testing should notify the case. The laboratory that diagnoses the condition should also notify the case	A person with acute onset of fever > 38°C, and with at least three of the following signs and symptoms: • severe headache, myalgia, prostration, flushing, • nausea, vomiting, pharyngitis, conjunctival injection, • petechial rashes, bleeding into skin (ecchymoses), from nose, vomiting of blood, blood in urine or stool, decreased platelets count, • hypotension and shock, leukopenia or leukocytosis, elevated AST or ALT (> 100 U/L), oedema or neurologic signs. AND a likely epidemiological exposure including any of • a history of being bitten by tick/s or crushed tick with bare hands, or • direct contact with fresh blood or other tissues of hoofed livestock or game or ostriches, or • direct contact with blood, secretion or excretions of confirmed or suspected CCHF patient (including needle pricks) OR • resides in or visited a rural environment where contact with livestock or ticks was possible in the past 15 days.	Any deceased suspected case (where it has not been possible to collect specimens for laboratory confirmation) having an epidemiological link.	A confirmed case is a person with laboratory evidence of CCHF infection as evidenced by • PCR positive and virus isolation from the patient's first (single) specimen, or • PCR positive and IgM positive result on patient's first (single) specimen, or • PCR positive on two separate specimens from the same patient collected at least one day apart, or • PCR positive but IgM/IgG negative result in patient's first specimen and PCR negative but IgM/IgG positive result in patient's second specimen collected at least one day apart, or • Increase in IgM/IgG titres between acute and convalescent specimens), or • is a suspected case with IgM positive result on patient's first specimen.

Additional notes

Clinicians suspecting CCHF haemorrhagic fever should contact the NICD 24-hour hotline (082-883-9920) for assistance with the diagnosis. Clinicians who submit specimens for CCHF testing should also complete the case investigation form that is found at https://www.nicd.ac.za/diseases-a-z-index/viral-haemorrhagic-fever-vhf/

Additional resources

Additional resources including a frequently asked question (FAQ) document and a case investigation form are available at https://www.nicd.ac.za/diseases-a-z-index/crimean-congo-haemorrhagic-fever-cchf/

Category 1: Immediate reporting telephonically followed by written or electronic notification within 24hrs of diagnosing a case

WATERBORNE ILLNESS OUTBREAK

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Confirmed case definition
Early identification of waterborne illness outbreaks will allow authorities to investigate the outbreak timeously, collect appropriate specimens, identify the outbreak source/s and implement interventions to prevent additional cases.	The healthcare worker who suspects the diagnosis should • notify the outbreak by completing a NMC notification form **for the index case only** • submit a complete linelist of affected persons to the responsible communicable disease control co-ordinator AND to the responsible environmental health practitioner AND to the NICD.	An incident in which two or more persons experience a similar illness (gastrointestinal) and are epidemiologically linked	[6]None

Additional notes

- It is not necessary to complete a NMC notification form for every single person affected by the outbreak. However a line list (see resources below) should be submitted with names and demographic details of all affected persons.
- Stool and/or vomitus specimens, and water specimens should be submitted to NHLS public health laboratories. See contact details for these labs in resources below.
- A complete investigation of a outbreak requires additional data and results –including results of laboratory testing of clinical and water specimens, symptoms and clinical features of affected persons, complete water exposure history from affected AND non-affected persons, and investigation of water sources. The Centre for Enteric Diseases at NICD, provides assistance with outbreak investigations.

Additional resources

The NICD-NHLS quick reference guide for the investigation of food-borne disease outbreaks (which may also be used for the investigation of water borne outbreaks) (2012), line list (2012), case-investigation form (CIF), and specimen submission forms for NHLS public health laboratories in Durban and Johannesburg are available at http://www.nicd.ac.za/diseases-a-z-index/foodborne-illness-and-gastroenteritis-outbreaks/

[6] The identification of a waterborne illness outbreak is a clinical and epidemiological diagnosis. No laboratory confirmation is required.

Category 1: Immediate reporting telephonically followed by written or electronic notification within 24hrs of diagnosing a case

YELLOW FEVER

Why is surveillance necessary?	Who must notify and when?	Suspected case definition	Probable case definition	Confirmed case definition
Yellow fever is an acute viral haemorrhagic disease transmitted by infected mosquitoes (*Aedes aegypti*). Humans can be fully potected if administered vaccination at least a month prior to travel to an endemic area in parts of Africa and South America. Vaccination at least ten days prior to travel provides 80-100% protection. Yellow fever is not known to occur in South Africa, and no imported cases have been documented. Notification of cases is essential as it will allow public health officials to investigate cases and conduct entomological investigations to prevent further cases.	The health care practitioner who suspects CCHF and requests laboratory testing should notify the case. The laboratory that diagnoses the condition should also notify the case	A person with sudden onset of fever >38.5°C and with • chills, headache, back and muscle pain, nausea and vomiting, followed by a 24-hour remission and a recurrence of signs and symptoms with subsequent jaundice, hepatitis, albuminuria, renal failure within two weeks, or • haemorrhagic signs, shock or death within three weeks of onset of illness AND a travel to a yellow fever endemic area in the week preceding the onset of illness, in the absence of vaccination against yellow fever (https://www.who.int/emergencies/yellow-fever/maps/en/).	Any deceased suspected case (where it has not been possible to collect specimens for laboratory confirmation) having an epidemiological link.	A confirmed case is a yellow fever unvaccinated person with laboratory evidence of yellow fever virus infection by • PCR positive and virus isolation from the patient's first (single) specimen, or • PCR positive and IgM positive result on patient's first (single) specimen, or • PCR positive on two separate specimens from the same patient collected at least one day apart, or • PCR positive but IgM/IgG negative result in patient's first specimen and PCR negative but IgM/IgG positive result in patient's second specimen collected at least one day apart, or • An increase in IgM/IgG titres between acute and convalescent specimens.
Additional notes Clinicians suspecting yellow fever should contact the NICD 24-hour hotline (082-883-9920) for assistance with the diagnosis. Clinicians who submit specimens for yellow fever testing should also complete the case investigation form that is found at https://www.nicd.ac.za/diseases-a-z-index/yellow-fever/				
Additional resources A frequently asked question (FAQ) document and a case investigation form are available at https://www.nicd.ac.za/diseases-a-z-index/yellow-fever/				

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

AGRICULTURAL OR STOCK REMEDY POISONING

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Probable case definition	Confirmed case definition
A pesticide (e.g. an agricultural or stock remedy) is any chemical substance, or mixture of substances, intended to kill, repel, or control forms of plant or animal life considered to be pests, or to regulate plant growth. Pesticides include herbicides, insecticides, fungicides, rodenticides, repellents. Pesticides are potentially toxic to humans and the environment, and can have both acute and chronic health effects, depending on the quantity and ways in which a person is exposed. Some pesticides can remain in soil and water for years. The toxicity of a pesticide depends on its function, formulation and the route of exposure (i.e. ingestion, inhalation, or direct contact through the skin or eyes). Pesticide poisoning can be classified as occupational, if exposure occurs while at work, or non-occupational, which includes exposure at home as well as all cases involving suicide or self-harming behaviour.	The health care provider making the clinical diagnosis for a suspected, probable or confirmed case. Clinicians should not wait for laboratory confirmation before notifying.	**Must satisfy ONE criterion in EACH category listed below:** 1. **Pesticide exposure** a. Report of acute pesticide exposure, from a patient or witness 2. **Health effects** a. Health care provider documenting ≥ 2 new post-exposure symptoms 3. **Cause-effect** relationship The health effects must: a. not be associated with any other likely explanation AND b. occur within a reasonable time period after exposure	**Must satisfy ONE criterion in EACH category listed below:** 1. **Pesticide exposure** a. If criterion as for a Suspected case, must have Health effects criterion as for Confirmed case OR b. If criterion as for a Confirmed case, may have Health effects criterion as for Suspected case 2. **Health effects** a. If criterion as for a Suspected case, must have Pesticide exposure criterion as for Confirmed case OR b. If criterion as for a Confirmed case, may have Pesticide exposure criterion as for Suspected case 3. **Cause-effect relationship** The health effects must: a. be characteristic of the pesticide	**Must satisfy ONE criterion in EACH category listed below:** 1. **Pesticide exposure** a. Observation of residue/odour by health care provider OR b. Clinical response to treatment or antidote (e.g. atropine) OR clinical description by a health care provider of ≥ 2 post-exposure health effects (at least 1 of which is a sign) characteristic for the pesticide OR c. Laboratory test demonstrating physiologic response to pesticide (e.g. prolonged clotting or pseudocholinesterase level below normal laboratory range) 2. **Health effects** a. Health care provider documenting ≥ 2 characteristic signs OR b. Health care provider documenting ≥ 3 new post-exposure characteristic symptoms OR

			AND b. occur within a reasonable time period after exposure	c. Autopsy evidence of pesticide poisoning 3. **Cause-effect relationship** The health effects must: a. be characteristic of the pesticide AND b. occur within a reasonable time period after exposure

Additional resources

- Thundiyil, Josef G, Stober, Judy, Besbelli, Nida & Pronczuk, Jenny. (2008). Acute pesticide poisoning: a proposed classification tool. Bulletin of the World Health Organization, 86 (3), 205 - 209. World Health Organization. http://dx.doi.org/10.2471/BLT.08.041814
- https://ndc.services.cdc.gov/case-definitions/pesticide-related-illness-and-injury-acute-2010/

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

BILHARZIA (schistosomiasis)

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Probable case definition	Confirmed case definition
Parasitic fluke (schistosome) infection, acquired by skin exposure to surface water inhabited by infected intermediate host snails. Two species of schistosome produce urogenital and intestinal infections, respectively, with both shared and organ-specific clinical features.	✓ Health care practitioner *(nurse or doctor receiving the laboratory result)* ✓ Laboratory making the diagnosis	A person with compatible clinical features of acute infection (fever, hepatosplenomegaly, urticaria, diarrhoea, etc), or intermediate infection (haematuria, cervicitis, etc) or late infection (hydronephrosis, portal hypertension, etc), and history of exposure in an endemic area.	A person with compatible clinical features and history of exposure in an endemic area, plus a single positive serological or antigen test, and/or haematuria, and/or raised eosinophil count (>0.45 x 10^9/L).	Schistosome eggs reported in urine or faeces, or on histopathology in biopsy samples; or ≥4-fold rise in titre of serological test over 2 weeks; or repeatedly positive antigen test

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

BRUCELLOSIS

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Probable case definition	Confirmed case definition
Brucellosis is an infectious disease caused by Brucella bacteria (melitensis and abortus). People can get the disease when they are in contact with infected animals or animal products contaminated (unpasteurised milk/dairy products) with the Brucella bacteria. Animals that are most commonly infected include sheep, cattle, goats. Pig, and dog brucellosis have not occurred in South Africa. Initial symptoms can include: fever, sweats, malaise, anorexia, headache, pain in muscles, joint, and/or back, fatigue. Some signs and symptoms may persist for longer periods of time. Others may never go away or reoccur and include recurrent fevers, arthritis, swelling of the testicle and scrotum area, swelling of the heart (endocarditis), neurologic symptoms (in up to 5% of all cases), chronic fatigue, depression, swelling of the liver and/or spleen. There is a vaccine available for prevention in animals and reduce risk of exposure to humans. Treatment of human brucellosis requires longterm multiple antibiotic course. Brucellosis is rarely fatal if treated; in untreated persons, estimates of the case fatality rate vary from less than 2% to 5%. Deaths are usually caused by endocarditis or meningitis.	✓ Health care practitioner *(nurse or doctor receiving the laboratory result)* ✓ Laboratory making detecting the bacteria.	A person with acute or insidious onset of intermittent or irregular fever of variable duration, night sweats, undue fatigue, anorexia, weight loss, headache, and arthralgia. Local infection of organs may occur AND having relevant epidemiological exposure (e.g Occupational contact with infected ruminants or birth excretions or fetuses; or by eating or drinking unpasteurized/raw dairy products or undercooked meat; or breathing brucella bacteria in slaughterhouses or laboratory.	A probable case is a suspected case with a. laboratory Gram-ve Bacillus culture; OR b. A single high agglutination titre to Brucella; OR c. Detection of Brucella species by PCR testing from a normally sterile site other than blood.	A confirmed case is a person with laboratory evidence of Brucella infection by (a. Culture isolation of Brucella species; OR b.Detection of Brucella species by PCR testing from a blood sample; OR c.IgG seroconversion or a significant increase in IgG antibody level (e.g. fourfold or greater rise) to Brucella).

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

CONGENITAL RUBELLA SYNDROME

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Clinically confirmed case definition	Laboratory confirmed case definition
Congenital rubella syndrome (CRS) may occur in the foetus/neonate when a pregnant women who is not immune to rubella (i.e. has not had natural infection, nor vaccination) contracts rubella infection. CRS is a symptom complex. Diagnosis requires clinical evaluation and laboratory tests. Rubella preventable by vaccination. South Africa has not yet included rubella vaccine in our EPI programme, however, most countries in the world include it with the measles vaccine. Rubella is targeted for elimination by the WHO. Acute rubella in an infant, child or adult is a Category 3 notifiable condition	✓ Health care practitioner *(nurse or doctor receiving the laboratory result)* ✓ Laboratory making the diagnosis	Any infant less than one year of age presents with heart disease and/or suspicion of deafness and/or one or more of the following eye signs: -white pupil (cataract), -diminished vision, -pendular movement of the eyes (nystagmus), -squint, -smaller eye ball (microphthalmus), or larger eye ball (congenital glaucoma). A health worker should also suspect CRS when an infantís mother has a history of suspected or confirmed rubella during pregnancy, even when the infant shows no signs of CRS	An infant in whom a qualified physician detects 1. at least two of the complications listed in A OR 2. One complication in A and one in B A: Cataract(s), congenital glaucoma, congenital heart disease, loss of hearing, pigmentary retinopathy B: Purpura, splenomegaly, microcephaly, mental retardation, meningocephalitis, radiolucent bone disease, jaundice that begins within 24 hours after birth	An infant with clinically-confirmed CRS who has a positive blood test for rubella-specific IgM and/or is PCR positive for rubella virus from any clinical specimen (e.g. blood, lens tissue, urine or CSF). confirmation of CRS An infant who has a positive rubella IgM test, but does not have clinically confirmed CRS is classified as having congenital rubella infection (CRI). These cases should also be notified.

Additional notes

- All infants with CRS are positive for rubella-specific IgM at the age of 0-5 months; 60% are positive at 6-11 months. Amongst infants and children with CRS, 60% shed rubella virus in the throat or urine until the age of 1-4 months, 30% at 5-8 months: 10% at 9-11 months.

Additional resources

The WHO standard for congenital rubella surveillance may be found at
https://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/rubella_standards/en/

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

CONGENITAL SYPHILIS

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Probable case definition	Confirmed case definition
A condition affecting an infant or child (< 2 years) whose mother had untreated or inadequately treated syphilis. **Early Congenital Syphilis**: may present anytime in infancy or early childhood (< 2 years). An infected infant may be asymptomatic at birth and develop signs 4-8 weeks after birth.	✓ Health care practitioner *(nurse or doctor receiving the laboratory result)*	Any case meeting the following criteria will be considered a case of congenital syphilis: [1] A live birth or fetal death at more than 20 weeks of gestation or >500 g (including stillbirth) born to a woman with positive syphilis serology **AND** without adequate syphilis treatment. Adequate maternal treatment is defined as at least one injection/dose of 2.4 million units of intramuscular benzathine benzylpenicillin at least 30 days prior to delivery. **OR** [2] A live birth, stillbirth or child aged <2 years born to a woman with positive syphilis serology or with unknown serostatus, and with **laboratory evidence** of syphilis infection (regardless of the timing or adequacy of maternal treatment). *The following constitutes acceptable laboratory evidence* • Demonstration by dark-field microscopy or fluorescent antibody detection of Treponema pallidum in the umbilical cord, placenta, nasal discharge or skin lesion material or autopsy material of a neonate or stillborn infant; • Treponema pallidum PCR positive on umbilical cord, placenta, nasal discharge or skin lesion material or autops material of a neonate or stillborn infant • Analysis of cerebrospinal fluid (CSF) is reactive for Venereal Disease Research Laboratory (VDRL) test, or elevated CSF cell count or protein; • Infant with a reactive non-treponemal (RPR) serology titre fourfold or more than that of the mother; • Infant with a reactive non-treponemal (RPR) serology titre < fourfold more than that of the mother but that remains reactive ≥6 months after delivery; • Infant with a reactive non-treponemal serology test (RPR or VDRL) of any titre **AND** any of the clinical signs listed below born to a mother with positive or unknown serology, independent of treatment • Any stillborn infant with a reactive maternal test should be considered a congenital syphilis case (i.e. a syphilitic stillbirth). **AND/OR** [3] A live birth, stillbirth or child aged <2 years born to a woman with positive syphilis serology or with unknown serostatus, and with radiographic clinical evidence of syphilis infection (regardless of the timing or adequacy of maternal treatment). *Acceptable radiological evidence refers to:* • Long bone radiographs suggestive of congenital syphilis (e.g. osteochondritis, diaphyseal osteomyelitis, periostitis); **AND/OR**		

		[4] A live birth, stillbirth or child aged <2 years born to a woman with positive syphilis serology or with unknown serostatus, and with clinical evidence of syphilis infection (regardless of the timing or adequacy of maternal treatment). *Acceptable clinical evidence* • In settings where a non-treponemal (RPR) titre is not available, an infant born to a mother with reactive or unknown serology, independent of treatment, and whose 6-month examination demonstrates any of the early clinical signs listed below; o Early clinical signs that may be present in an infant with congenital syphilis include non-immune hydrops, hepatosplenomegaly, rhinitis (snuffles), and skin rash, pseudoparalysis of an extremity or failure to thrive or achieve developmental milestones. o An older infant or child may develop additional signs or symptoms such as frontal bossing, notched and pegged teeth (Hutchinson teeth), clouding of the cornea, blindness, bone pain, decreased hearing or deafness, joint swelling, sabre shins, and scarring of the skin around the mouth, genitals and anus.

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

HAEMOPHILUS INFLUENZAE TYPE B

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Probable case definition	Confirmed case definition
Haemophilus influenzae type b (Hib) causes pneumonia, septicaemia, meningitis, epiglottitis, septic arthritis, cellulitis, otitis media, and purulent pericarditis, as well as less common invasive infections such as endocarditis, osteomyelitis, and peritonitis. Infections are clinically indistinguishable from infections caused by other bacteria. Spread by droplets or direct contact with respiratory tract secretions. Asymptomatic carriage occurs.	✓ Health care practitioner *(nurse or doctor receiving the laboratory result)* ✓ Laboratory making the diagnosis	Cannot be notified as a clinically suspected case	Invasive disease such as bacteremia, meningitis, epiglottitis, cellulitis, septic arthritis, pneumonia, empyema, pericarditis or osteomyelitis where the public health physician, in consultation with the physician and microbiologist, considers that Hib disease is the most likely diagnosis	The isolation of *Haemophilus influenzae* type b from a normally sterile site specimen (e.g., blood; cerebrospinal, pericardial or synovial fluid), or a positive Gram stain and latex result, or a positive PCR result.

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

HEPATITIS A

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Confirmed case definition
Hepatitis A virus is an enteric virus and is transmitted via the faecal-oral route (ingestion of contaminated food and/or water). Outbreaks of hepatitis A may occur following point source contamination of food or water, or transmission from person to person within households or instutions.	✓ Health care practitioner *(nurse or doctor receiving the laboratory result)* ✓ Laboratory making the diagnosis	This condition cannot be notified clinically, as it mimics any other cause of acute infectious hepatitis. Heptatitis A may be suspected when a persons presents with an acute onset of fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, abdominal pain, or dark urine, along with jaundice or elevated total bilirubin or raised serum alanine aminotransferase (ALT) levels in the absence of a more likely diagnosis	A laboratory confirmed case of hepatitis A may be diagnosed in a person with compatible symptoms and the presence of hepatitis A-specific IgM antibodies(anti-HAV IgM).

Additional notes

- Hepatitis A is preventable by vaccinination, however this vaccine is not part of the EPI programme. Hepatitis A vaccine may be purchased in the private sector, or obtained in the public sector for high-risk persons, e.g. persons undergoing chemotherapy or transplants, or persons with inherited disorders of the immune system.

Additional resources

The South African National Guidelines for the Management of Viral Hepatitis may be found at https://www.nicd.ac.za/wp-content/uploads/2021/08/RSA_NationalHepatitisGuidelines_final_dec_2019.pdf

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

HEPATITIS B

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Confirmed case definition
Heptatitis B is a viral infection of the liver which may present with acute or chronic symptoms. Modes of transmission include perinatal, blood borne (e.g. in the health-care setting, or sharing of needles) and sexual. Hepatitis B is preventable by vaccination. Vaccine is administered as part of the EPI at 6,10, 14 weeks followed by a booster at 18 months.	✓ Health care practitioner *(nurse or doctor receiving the laboratory result)* ✓ Laboratory making the diagnosis	-Acute hepatitis B may not be notified clinically, as it mimics any other cause of acute infectious hepatitis Acute hepatitis B may be suspected when a person presents with an acute onset of fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, abdominal pain, or dark urine, along with jaundice or elevated total bilirubin or raised serum alanine aminotransferase (ALT) levels in the absence of a more likely diagnosis. The diagnosis must be confirmed with laboratory testing. Chronic hepatitis B may be asymptomatic or it may present with a range of symptoms from mild right upper quandrant tenderness to symptoms of cirrhosis or hepatocellular carcinoma.	1)Acute hepatitis B: - Anti-HBc IgM positive, or - anti-HBc IgM +ve AND HBs antigen positive 2)Chronic hepatitis B: - HBs antigen +ve for six months or longer, Refer to specialist guidelines for additional diagnostic parameters. The pattern of positive antigen and antibody combinations may evolve over time. Therefore the diagnosis of chronic hepatitis B may be complex.

Additional notes

- Congenital hepatitis B may occur if an infant is born to a mother with acute or chronic hepatitis B. Congenital hepatitis B is preventable by administration of a birth dose of hepatitis B vaccine. However, the South African EPI does not include a birth dose of hepatitis B.
- Hepatitis B vaccine was introduced into the national expanded programme of immunisation in 1995. Persons born before 1995 are at higher risk for acute and chronic hepatitis B

Additional resources

The South African National Guidelines for the Management of Viral Hepatitis may be found at https://www.nicd.ac.za/wp-content/uploads/2021/08/RSA_NationalHepatitisGuidelines_final_dec_2019.pdf

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

HEPATITIS C

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Probable case definition	Confirmed case definition
Heptatitis C is a viral infection of the liver. Transmission of hepatitis C includes perinatal, blood borne (e.g. in the health-care setting, or sharing of needles) and sexual.	✓ Health care practitioner (nurse or doctor receiving the laboratory result) ✓ Laboratory making the diagnosis	Acute hepatitis C may not be notified clinically, as it mimics any other cause of acute infectious hepatitis Acute hepatitis C may be suspected when a person presents with an acute onset of fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, abdominal pain, or dark urine, along with jaundice or elevated total bilirubin or raised serum alanine aminotransferase (ALT) levels in the absence of a more likely diagnosis. The diagnosis must be confirmed with laboratory testing. Chronic hepatitis C may be asymptomatic or it may present with a range of symptoms from mild right upper quandrant tenderness to symptoms of cirrhosis or hepatocellular carcinoma.	N/A	1)Acute: HCV RNA +ve and anti-HCV –ve OR Seroconversion to anti-HCV positive 2)Chronic: HCV RNA +ve for 6 months or longer

Additional resources

The South African National Guidelines for the Management of Viral Hepatitis may be found at https://www.nicd.ac.za/wp-content/uploads/2021/08/RSA_NationalHepatitisGuidelines_final_dec_2019.pdf

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

HEPATITIS E

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Probable case definition	Confirmed case definition
Hepatitis E virus is an enteric virus, transmitted mainly via the faecal-oral route (ingestion of contaminated food and/or water). Hepatitis E may be associated with outbreaks of acute illness. Severe disease may occur in pregnant women in their third trimester with high mortality (25%).	✓ Health care practitioner (nurse or doctor receiving the laboratory result) ✓ Laboratory making the diagnosis	This condition cannot be notified cbased on clinical suspiscion		The presence of hepatitis E-specific IgM antibodies (Anti-HEV IgM) OR HEV PCR positive

Additional resources

The South African National Guidelines for the Management of Viral Hepatitis may be found at https://www.nicd.ac.za/wp-content/uploads/2021/08/RSA_NationalHepatitisGuidelines_final_dec_2019.pdf

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

LEAD POISONING

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Probable case definition	Confirmed case definition
Lead is a naturally occurring, silver-grey metal, with properties such as malleability, a low melting point and non-corrosiveness. Due to Its versatility, lead is used in many circumstances and products, including batteries, petrol, paint, pigments, firearms, ammunition, artisanal cookware, ceramic ware, traditional medicines, protective equipment, cabling and certain cottage industries. Soil and dust can also be contaminated with lead particles. Exposure is mainly by ingestion or inhalation, with lead being stored in the body for many years. Lead may cause acute toxicity, but more commonly sub-clinical lead exposure leads to chronic toxicity. The target organs of lead toxicity are the central and peripheral nervous systems, the kidneys and the gastrointestinal system. Lead may also produce haematological effects. In children undergoing investigation for anaemia, recurrent abdominal pain and pica, a blood lead concentration should be measured.	✓ The health care provider making the clinical diagnosis for a suspected, probable or confirmed case. Clinicians should not wait for laboratory confirmation before notifying. OR ✓ Laboratory making the diagnosis, including forensic services.	A potentially lead-exposed case being evaluated by health care workers or public health officials for lead poisoning. OR A case with a single capillary blood specimen with lead level > 5 µg/dL	A clinically compatible case with a high index of suspicion for lead exposure due to case's history regarding location, source and time of exposure. OR A clinically compatible case with an epidemiologic link to a case with laboratory evidence. OR A case with two capillary blood specimens, drawn within 12 weeks, both with lead level > 5 µg/dL	Children and adults, with either of the following: • Blood lead level > 5 µg/dL of whole blood measured from a venous specimen; or • Blood lead level of > 5 µg/dL measured from two capillary specimens taken within a period of 4 weeks.

Additional resources

https://wwwn.cdc.gov/nndss/conditions/lead-elevated-blood-levels/case-definition/2016/

https://wwwn.cdc.gov/nndss/conditions/lead-elevated-blood-levels/case-definition/2010/

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

LEGIONELLOSIS

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Probable case definition	Confirmed case definition
Disease caused by bacteria from the genus *Legionella* commonly presents with a spectrum of illness ranging from asymptomatic, to severe pneumonia (Legionnaire's Disease), often requiring hospitalisation. Acquired from inhalation of contaminated aerosols.	✓ Health care practitioner (nurse or doctor receiving the laboratory result) ✓ Laboratory making the diagnosis	Any person with clinical/radiological evidence of pneumonia where the public health physician, in consultation with the physician and microbiologist, considers that Legionnaire's disease as the most likely diagnosis.	Any person with clinical/radiological evidence of pneumonia with: 1) *Legionella pneumophila* non-serogroup 1 or other *Legionella* spp. specific antibody response (fourfold or greater rise in specific serum antibody titer).	Any person with clinical/radiological evidence of pneumonia and at least one of the following: 1) Isolation of *Legionella* spp. from a respiratory specimen or any normally sterile site 2) Detection of *Legionella pneumophila* serogroup 1 antigen in urine 3) Detection of *Legionella* spp. nucleic acid in a clinical specimen 4) *Legionella* pneumophila serogroup 1 specific antibody response (fourfold or greater rise in specific serum antibody titer).

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

LEPROSY

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Probable case definition	Confirmed case definition
	✓ Health care practitioner (nurse or doctor receiving the laboratory result) ✓ Laboratory making the diagnosis	A case of leprosy is defined as any person having one or more of the following • Hypo-pigmented or reddish skin lesion(s) with definitive loss of sensation; • Damage to the peripheral nerves, as demonstrated by loss of sensation and weakness or morbidity of the muscles of hands, feet or face; and	No probable case definition	A positive skin-smear for acid-fast bacilli or positive biopsy. (But where laboratory test cannot be conducted, diagnosis is often established from patient 's clinical signs and symptoms).

Category 2: Written or electronic notification within 7days of diagnosing a case.

MATERNAL DEATH (PREGNANCY, CHILDBIRTH AND PUERPERIUM)

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Probable case definition	Confirmed case definition
	✓ Health care practitioner (nurse or doctor who provided medical care at the time of death)	No suspected case definition	No probable case definition	No laboratory based confirmation

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

MERCURY POISONING

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Probable case definition	Confirmed case definition
Mercury is an element that occurs widely in the environment, from both natural and human sources (mining waste, especially informal gold mining, municipal incinerators, power plants, hazardous waste sites, dentistry, medical equipment and manufacturers of products containing mercury). Mercury occurs in three forms: organic, inorganic, and elemental (metallic). All forms of mercury, and especially the organic form, are toxic. The clinical presentation varies depending upon the form of mercury, as well as the route of exposure (inhalation, ingestion, topical or injection), patient age and dose and duration. All organ systems can be affected, and effects may be acute or chronic. • Organic mercury (e.g. methylmercury contamination in fish): Ingestion most common route, followed by inhalation and dermal exposures. Toxicity - can be delayed for weeks and usually involves the central nervous system (e.g. paraesthesia, headaches, ataxia, dysarthria, visual field constriction, blindness, and hearing impairment). • Inorganic mercury: Ingestion most common route of toxicity. Acute toxicity - gastrointestinal symptoms, shock, renal failure, death. Chronic toxicity - neurologic, dermatologic, and renal manifestations, including neuropsychiatric disturbances (e.g., memory loss, irritability), gingivostomatitis, discoloration or desquamation of the hands and feet, and hypertension. • Elemental mercury: Inhalational most typical route of toxicity. Acute toxicity – fever, fatigue, as well as gastrointestinal, respiratory and central nervous system effects. Chronic toxicity–similar to inorganic toxicity	✓ The health care provider making the clinical diagnosis for a suspected, probable or confirmed case. Clinicians should not wait for laboratory confirmation before notifying. OR ✓ Laboratory making the diagnosis, including forensic services.	A potentially mercury-exposed case being evaluated by health care workers or public health officials for mercury poisoning.	A clinically compatible case with a high index of suspicion for mercury exposure due to case's history regarding location, source and time of exposure. OR A clinically compatible case with an epidemiologic link to a case with laboratory evidence.	A clinically compatible illness in a person with history of exposure and laboratory evidence*, i.e. •Organic mercury ➢ ≥10 µg/L in whole blood •Inorganic mercury ➢ ≥10 µg/L in 24-hour urine ➢ ≥10 µg/L in whole blood •Elemental mercury ➢ ≥10 µg/L in 24-hour urine ➢ ≥10 µg/L in whole blood (first few days after exposure only)
Additional resources https://emergency.cdc.gov/agent/mercury/mercorgcasedef.asp				

Category 2: Written or electronic notification within 7days of diagnosing a case. The case must be notified following laboratory confirmation

SOIL TRANSMITTED HELMINTHS

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Probable case definition	Confirmed case definition
Soil transmitted helminth infections (STH) are caused by species, including *Ascaris lumbricoides*, hookworm (*Ancylostoma duodenale* and *Necator americanus*) and *Trichuris trichiura*. STH infections may be asymptomatic, heavy infections are associated with considerable morbidity, including abdominal pain, diarrhea and anemia, as well as impaired cognitive and physical development in children. STH infections focus on morbidity control through the use of mass drug administration (MDA) of anthelmintic drugs targeting preschool- and school-aged children as well as other at-risk groups.	✓ Health care practitioner (nurse or doctor receiving the laboratory result) ✓ Laboratory detecing the STH **NB: Only confirmed cases should be notified.**	There is no case definition of a suspected case.	NA	Real-time PCR detection of *Ascaris lumbricoides*, *Necator americanus*, *Ancylostoma duodenale* and *Trichuris trichiura*.

Category 2: Written or electronic notification within 7days of diagnosing a case.

TETANUS

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Confirmed case definition
Tetanus is caused by the bacterium *Clostridium tetani*. In neonates or adults, tetanus follows contamination of a wound (or umbilical stump) with the bacterium in a susceptible person. Tetanus is preventable by immunisation with tetanus toxoid, as part of the EPI programme. Tetanus toxoid is given at 6, 10, 14 weeks, with boosters at 18 months, 6 yrs and 12 years. Neonatal tetatus is targeted for elimination. Maternal immunization with tetanus toxoid may prevent neonatal tetanus	✓ Health care practitioner (nurse or doctor making the diagnosis)	Any person >28 days of age with acute onset of at least one of the following: trismus (lockjaw), risus sardonicus (sustained spasm of the facial muscles) or generalised muscle spasms (contractions)	- Neonatal tetanus: An infant with normal feeding and crying in first two days of life who subsequently losses these abilities between 3 and 28 days of life and developed muscle rigidity and spasms. - Children and adults: Any person >28 days of age with acute onset of at least one of the following: trismus (lockjaw), risus sardonicus (sustained spasm of the facial muscles) or generalised muscle spasms (contractions) where the diagnosis has been confirmed by a physician or trained clinician.

Additional notes

Notes: Neonatal tetanus may arise through traditional birth practices. Tetanus in adults and children may arise following contamination of wounds with the bacterium in the presence of waned immunity, or incomplete primary vaccination. In children and adults, there are three clinical presentations: localised tetanus in which musces around injusry site have spasms, cephalic tetanus in which there is cranial nerve palsy following ear infection or head lesion and thirdly generalised tetanus which affects all voluntary skeletal muscles of the body.

The incubation period for neonatal tetanus is 3 to 21 days but disease can occur up to 178 days following infection. The WHO estimated that there were about 34019 deaths from neonatal tetanus in 2015.

There is no laboratory diagnostic nor confirmatory test for tetanus. *Clostridium tetani* is isolated only from 30% of wounds from clinically confirmed cases, but may also be isolated from wounds where tetanus is not diagnosed. Not all bacterial isolates of *Clostridium tetani* produce the toxin.

Category 2: Written or electronic notification within 7days of diagnosing a case.

Tuberculosis: pulmonary
Tuberculosis: extra-pulmonary
Tuberculosis: multidrug-resistant (MDR-TB)
Tuberculosis: extensively drug-resistant (XDR-TB)

Disease epidemiology	Who must notify	Clinical case definition (Suspected case)	Probable case definition	Confirmed case definition
South Africa is one of the 30 high burden tuberculosis (TB) countries that collectively contribute to 87% of the estimated incident cases worldwide, and the country accounts for 3% of cases globally. The TB incidence in South Africa is currently 615/100000 population and the HIV co-infection rate is 59% The First National Tuberculosis Prevalence Survey, South Africa, 2018, identified a high TB burden, higher in males than in females and high prevalence of TB among individuals aged 35-44 years and the elderly 65 years and older. The largest prevalence to notification gap was in the youth aged 15-24 years and in those 65 years and older	✓ Health care practitioner (nurse or doctor assessing the patient) or Inefction control Practioner ✓ Health care practitioner (nurse or doctor receiving the laboratory result) ✓ Laboratory making the diagnosis	Clinically diagnosed TB People who are started on TB treatment without bacteriological confirmation of disease. This includes patients started on treatment based on; • chest x-ray abnormalities that are consistent with active TB • the history and clinical picture suggestive of PTB or EPTB • histological and biochemical tests suggestive of TB *Refer to the TB national treatment guidelines for South Africa*	Refer to the TB national treatment guidelines for South Africa	Bacteriologically confirmed Tuberculosis Clinically confirmed Tuberculosis A patient with Mycobacterium tuberculosis complex identified from a clinical specimen, either by smear microscopy, culture or molecular assays *Refer to the TB national treatment guidelines for South Africa*

Category 3: Written or electronic notification within 7days of diagnosing by private and public health laboratories.

CEFTRIAXONE –RESISTANT NEISSERIA GONORRHOEA

Disease epidemiology	Who must notify	Confirmed case definition
Gonorrhoea is a sexually transmitted infection caused by the bacterium *Neisseria gonorrhoeae*. The organism can infect the urogenital tract causing urethritis in men, and cervicitis or abnormal vaginal discharge in women. In South Africa, *N. gonorrhoeae* is the commonest cause of Male Urethritis Syndrome (in approximately 80% of cases). A significant proportion of infections, particularly in women, may be asymptomatic. A small proportion of infected persons will develop disseminated gonococcal infection by haematogenous spread, manifesting as an arthritis-dermatitis syndrome. *Neisseria gonorrhoeae* has the capacity to evolve and rapidly develop resistance to all first-line antimicrobials used in treatment. For this reason, it has been designated a high priority pathogen by the WHO. The currently recommended treatment for urogenital gonorrhoea is dual ceftriaxone 250mg stat IM + azithromycin 1g stat PO. Ceftriaxone, which is an extended-spectrum cephalosporin, is the mainstay of therapy for *N. gonorrhoeae* and it is essential to monitor for resistance to this agent, particularly in cases of suspected treatment failure (i.e. non-resolving/ persistent urogenital infection). *N. gonorrhoeae* may be cultured from persons who are symptomatic or asymptomatic for gonorrhoea. Specimens for culture include dacron or nylon flocked swabs of urogenital tract/ pharynx/ rectum/ ocular discharge; and sterile sites specimens (blood, synovial fluid).	Ceftriaxone-resistant gonorrhoea will be notified by public or private health laboratories following culture isolation of *N. gonorrhoeae* and antimicrobial susceptibility testing. Isolate should be referred to STI Reference laboratory at NICD for confirmation of ceftriaxone resistance and further testing. Confirmation of ceftriaxone resistance will be done by STI reference laboratory at NICD.	*Neisseria gonorrhoeae* culture isolate with Ceftriaxone E-test MIC $\geq$ 0.25 µg/ml

Category 3: Written or electronic notification within 7days of diagnosing by private and public health laboratories

DENGUE FEVER VIRUS (OTHER IMPORTED ARBOVIRUSES OF MEDICAL IMPORTANCE)

Disease epidemiology	Who must notify	Confirmed case definition
Dengue is the most-widespread mosquito-transmitted viral disease, which is found in travellers that returned from urban areas in Africa, Carribean, Latin America, Middle East, India, southeastern Asia and the Pacific islands especially during the rainy seasons. Dengue fever is caused by one of four serotypes: Dengue virus 1, 2, 3, and 4. For this reason, a person can be infected with a dengue virus as many as four times in his or her lifetime. Dengue fever may occur in various forms. Leukopenia and thrombocytopenia are common. The majority of cases with dengue fever have characterised by high fever, severe headache, pain behind eyes, body aches/ joint pains, nausea/vomiting and a characteristic rash (looks like sun burn). In some instances, Dengue fever can lead to Dengue haemorrhagic fever (DHF) or Dengue shock syndrome (DSS), which manifest similar to dengue fever plus in DHF: severe and continuous pain in abdomen, bleeding from the nose, mouth, gums or skin bruising, frequent vomiting with or without blood, black stools, excessive thirst (dry mouth), pale, cold skin, restlessness, or sleepiness or with DSS: weak rapid pulse, narrow pulse pressure, cold, clammy skin and restless. 5% of severe Dengue cases (DHF and DSS) result in death.	✓ Health care practitioner (nurse or doctor receiving the laboratory result) ✓ Laboratory detecting the virus **NB: Only confirmed cases should be notified.**	A confirmed case is a person with laboratory evidence of virus detection by • PCR positive and virus isolation from the patient's first (single) specimen; OR • PCR positive and IgM positive result on patient's first (single) specimen; OR • PCR positive on two separate specimens from the same patient collected at least one day apart; OR • PCR positive but IgM/IgG negative result in patient's first specimen and PCR negative but IgM/IgG positive result in patient's second specimen collected at least one day apart; OR Four-fold increase in IgM/IgG titres between acute and convalescent specimens.

Category 3: Written or electronic notification within 7days of diagnosing by private and public health laboratories

WEST NILE VIRUS, SINDBIS VIRUS, CHIKUNGUNYA VIRUS

Disease epidemiology	Who must notify	Confirmed case definition
West Nile, sindbis and chikungunya fever are viral diseases that are transmitted to people by mosquitoes of *Culex* species (West Nile virus and sindbis virus) which mainly bite at night and *Aedes* species (Chikungunya virus), which bite during the day. In a very small number of cases, West Nile virus has also been spread through blood transfusions, organ transplants, breastfeeding and in pregnancy from mother to baby. Both West Nile and sindbis virus are maintained in bird-mosquito cycle, whereas chikungunya virus in non-human primates. West Nile virus occurs worldwide, except for few countries such as Australia. West Nile fever is often asymptomatic or symptoms include headache, low-grade fever, rash, joint and body pains. Encephalitis and meningitis are rare complications of West Nile virus infection, except for the USA. Horses also get incidentally infected and can develop encephalitis. Sindbis virus is widely distributed, being found in Africa, Europe, Asia and Australia. Sindbis fever can cause mild fever with joint pain, nausea, general malaise, headache, muscle pain and a unique maculopapular rash circled with pale? halos, often accompanied with an itchy exanthema over the trunk and the limbs. Chikungunya virus is endemic in northeastern South Africa and occurs in travellers that returned from urban outbreak areas in sub-Saharan Africa, Latin-America, southern USA, Italy and France, Saudi Arabia, Yemen, India, south and south-East Asia. Chikungunya fever is characterised by fever and severe debilitating joint pains, often in the hands and feet and may include headache, muscle pain, joint swelling or rash. No vaccines and therapeutics are currently avaialable for prevention and treatment.	✓ Health care practitioner (nurse or doctor receiving the laboratory result) ✓ Laboratory detecting the virus **NB: Only confirmed cases should be notified.**	A confirmed case is a person with laboratory evidence of virus detection by • PCR positive and virus isolation from the patient's first (single) specimen; OR • PCR positive and IgM positive result on patient's first (single) specimen; OR • PCR positive on two separate specimens from the same patient collected at least one day apart; OR • PCR positive but IgM/IgG negative result in patient's first specimen and PCR negative but IgM/IgG positive result in patient's second specimen collected at least one day apart; OR • Four-fold increase in IgM/IgG titres between acute and convalescent specimens.

Category 3: Written or electronic notification within 7days of diagnosing by private and public health laboratories. The case must be edited following laboratory confirmation

RUBELLA VIRUS

Disease epidemiology	Who must notify	Confirmed case definition
Rubella is a mild clinical illness that presents with fever and a maculo-papular rash. Rubella in a pregnant woman can lead to congenital rubella infection in her infant. Congenital rubella is a symptom complex and is also notifiable in South Africa as a category 2 condition. Rubella is preventable by vaccination. Rubella is targeted for elimination by the WHO. South Africa has not yet included rubella vaccine in our EPI programme, however, most countries in the world include it with the measles vaccine.	Any clinician who suspects a rubellacase should notify the case immediately.	A laboratory-confirmed case is a suspected case with a positive blood test for rubella-specific IgM. The blood specimen should be obtained within 28 days after the onset of rash.

Additional notes

- The WHO also defines a suspected rubella case as any patient of any age in whom a health worker suspects rubella. A health worker should suspect rubella when a patient presents with fever, maculopapular rash; and cervical, suboccipital or postauricular adenopathy or arthralgia/arthritis.
- Rubella is not distinguishable from measles on the basis of clinical symptoms alone. It may be advisable to request measles serology in addition to rubella serology on everyone who presents with symptoms of rubella, especially if there is no history of measles vaccination. See case definition for measles (Category 1). When blood for rubella testing is submitted to the NICD, it is routinely also tested for measles antibodies

Additional resources

- The WHO standard for rubella surveillance may be found at https://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/rubella_standards/en/

Category 3: Written or electronic notification within 7days of diagnosing by private and public health laboratories. The case must be edited following laboratory confirmation

SAMONELLA spp. OTHER THAN S.TYPHI AND S. PARATYPHI

Disease epidemiology	Who must notify	Confirmed case definition
Salmonella is one of the most frequently isolated foodborne pathogens and is a major global public health concern. All *Salmonella* spp. other than *S*. Typhi, *S*. Paratyphi A, *S*. Paratyphi B and *S*. Paratyphi C are collectively known as nontyphoidal *Salmonella*. Nontyphoidal *Salmonella* are widely distributed in domestic and wild animals. Nontyphoidal salmonellosis in humans is generally contracted through the consumption of contaminated food of animal origin (mainly eggs, meat, poultry, and milk), although other foods have been implicated in its transmission. Person-to-person transmission can also occur through the faecal-oral route, and contact with infected animals, including pets, can result in human cases.	All private and public health laboratories	Isolation of *Salmonella* (other than *S*. Typhi or *S*. Paratyphi A, B or C) in a clinical specimen OR Detection of *Salmonella* (other than *S*.Typhi or *S*. Paratyphi A, B or C) in a clinical specimen using a culture-independent diagnostic testing (CIDT), for example PCR

Category 3: Written or electronic notification within 7days of diagnosing by private and public health laboratories. The case must be edited following laboratory confirmation

SHIGA TOXIN-PRODUCING ESCHERICHIA COLI

Disease epidemiology	Who must notify	Confirmed case definition
Shiga toxin-producing *E. coli* (STEC) can cause severe foodborne disease. STEC is transmitted to humans primarily through consumption of contaminated foods, such as raw or undercooked ground meat products, raw milk, and contaminated raw vegetables and sprouts. In the majority of cases, the illness is self-limiting, but it may lead to a life-threatening disease including haemolytic uraemic syndrome (HUS), especially in young children and the elderly. *E. coli* O157:H7 is the most important STEC serotype in relation to public health; however, other serotypes have frequently been involved in sporadic cases and outbreaks.	All private and public health laboratories	Isolation of *E.coli* O157:H7 from a clinical specimen OR Detection of *E.coli* O157 in a clinical specimen using a culture-independent diagnostic test (CIDT) for example PCR OR Detection of Shiga toxin or Shiga toxin genes in a clinical specimen using PCR

Category 3: Written or electronic notification within 7days of diagnosing by private and public health laboratories. The case must be edited following laboratory confirmation

SHIGELLA spp.

Disease epidemiology	Who must notify	Confirmed case definition
Shigellosis is endemic worldwide; in low- and middle-income countries it occurs predominantly in children aged 1-4 years, but other risk groups for shigellosis include travellers to endemic areas, children in daycare with subsequent household transmission and men having sex with men. Humans are the only natural host for *Shigella* spp. Person-to-person spread is the commonest mode of transmission, but infection can also be caused by contaminated food or water.	All private and public health laboratories	Isolation of *Shigella* spp. from a clinical specimen OR Detection of *Shigella* spp. or *Shigella*/enteroinvasive *E.coli* (EIEC) in a clinical specimen using a culture-independent diagnostic testing (CIDT), for example PCR

Category 4: Written or electronic notification within 1 month of diagnosing by private and public health laboratories.

CARBAPENEM–RESISTANT ENTEROBACTERALES (PREVIOUSLY ENTEROBACTERIACEAE)

<table>
<tr><th>Disease epidemiology</th><th>Who must notify</th><th>What to notify</th><th>Confirmed case definition</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr>
<td>Carbapenem-resistant Enterobacterales (CRE) and/or carbapenem-producing Enterobacterales (CPE) are a group of Gram-negative bacteria that are resistant to the carbapenem class of antibiotics. CRE or CPE can produce enzymes that are able to break down carbapenems and survive if patients are treated with these antibiotics. Carbepenems are considered the last line of treatment against Gram-negative bacteria and they are categorized as reserve group of antibiotics by the World Health Organization. In patients with organism resistant to carbapenems alternative treatment is substandard and is difficult. People who are at risk of infections are usually those who are receiving health care in any setting (e.g., hospitals and long-term care facilities, dialysis centres, etc.) and received antibiotic therapy previously. CRE can cause many types of infections including bloodstream infections, urinary tract infections, surgical site infections, pneumonia and meningitis. People often get colonised first from coming into contact with contaminated medical devices, healthcare workers hands and/or equipment, and get infected following breaks in their skin or other tissue.</td>
<td>Laboratory making the diagnosis</td>
<td>Laboratories are to send monthly line lists of all patients with clinical specimens where a CRE was isolated. Only include isolates when resistance was determined using confirmatory methods, including Etest, broth microdilutions test, or PCR (OXA-48 & variants, NDM, KPC, IMP, VIM, GES, etc. detected).
Resistance should be based on interpretation of minimum inhibitory concentrations according to EUCAST or CLSI guidelines.

2021 guidelines for Enterobacterales*
<table>
<tr><td>Antibiotic</td><td colspan="2">Resistance criteria (MICs in µg/mL)</td></tr>
<tr><td></td><td>CLSI</td><td>EUCAST</td></tr>
<tr><td>Ertapenem</td><td>≥2</td><td>>0.5</td></tr>
<tr><td>Meropenem</td><td>≥4</td><td>>8*</td></tr>
<tr><td>Meropenem (CSF)</td><td>-</td><td>>2</td></tr>
<tr><td>Imipenem</td><td>≥4</td><td>>4</td></tr>
<tr><td>Doripenem</td><td>≥4</td><td>>2</td></tr>
</table>
*These guidelines are subject to change annually and therefore reporting should always be in line with the most recent recommendations.

In addition, laboratories are requested to report the total number of patients for which a microbiological culture test was done. If a patient has multiple cultures from the same specimen, they should be counted once. Similarly, if a patient has cultures done for multiple specimen type, they should be counted once.</td>
<td>A patient with an Enterobacterales that is resistant to either of the carbapenem (ertapenem, imipenem, meropenem or doripenem) cultured from any clinical specimen. Each CRE pathogen isolated from the same patient will be counted as a distinct case. A 30-day period will be used to deduplicate patients with more than one of the same CRE isolated.</td>
</tr>
</table>

Category 4: Written or electronic notification within 1 month of diagnosing by private and public health laboratories.

GLYCOPEPTIDE-RESISTANAT ENTEROCOCCI

<table>
<tr><th>Disease epidemiology</th><th>Who must notify</th><th>What to notify</th><th>Confirmed case definition</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr>
<td>Glycopeptide-resistance Enterococci (GRE) are Gram-positive bacteria that have developed the ability to survive in the presence of the glycopeptide antibiotics (such as vancomycin), normally used to treat people who are infected with Gram-positive bacteria. Enterococci are present in the human intestines and in the female genital tract without causing harm. They are also found in the environment, including in healthcare settings. GRE typically affect people who are ill (particularly those who have weakened immune systems) and admitted to hospitals, and those receiving treatment that may be weakening their immune system.</td>
<td>Laboratory making the diagnosis</td>
<td>Laboratories are to send monthly line lists of all patients with clinical specimens where a GRE was isolated. Only include isolates when resistance was determined using a confirmatory methods, including Etest, broth microdilutions test, or PCR (vanA, vanB, vanC1/vanC2, etc. detected). Resistance should be based on interpretation of minimum inhibitory concentrations according to EUCAST or CLSI guidelines

2021 guidelines for Enterococci*
<table>
<tr><td>Antibiotic</td><td colspan="2">Resistance criteria (MICs in µg/mL)</td></tr>
<tr><td></td><td>CLSI</td><td>EUCAST</td></tr>
<tr><td>Vancomycin</td><td>≥32</td><td>>4</td></tr>
<tr><td>Teicoplanin</td><td>≥32</td><td>>2</td></tr>
</table>
* These guidelines are subject to change annually and therefore reporting should always be in line with the most recent recommendations.

In addition, laboratories are requested to report the total number of patients for which a microbiological culture test was done. If a patient has multiple cultures from the same specimen, they should be counted once. Similarly, if a patient has cultures done for multiple specimen type, they should be counted once.</td>
<td>A patient with an Enterococci that is resistant to vancomycin (±teicoplanin) cultured from any clinical specimen. When multiple Enterococcus species are isolated from the same patient, each will be counted as a distinct case. A 30-day period will be used to deduplicate patients with more than one of the same Enterococci pathogen isolated.</td>
</tr>
</table>

Category 4: Written or electronic notification within 1 month of diagnosing by private and public health laboratories.

GLYCOPEPTIDE-RESISTANT STAPHYLOCOCCUS AUEUS

<table>
<tr><th>Disease epidemiology</th><th>Who must notify</th><th>What to notify</th><th>Confirmed case definition</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr>
<td>Staphylococcus aureus is a common Gram-positive bacterium that causes healthcare-associated infections. Patients with Staphylococcus aureus infections that are resistant to first line antibiotic treatment (methicillin) are mainly treated with glycopeptides, another class of antibiotics. Although uncommon, resistance to glycopeptides can occur in patients who have prolonged stays in hospital stays and prolonged treatment with glycopeptides. Vancomycin resistance is uncommon is seldom through the pathogen acquiring the vanA gene. A few cases of vancomycin resistant Staphylococcus aureus infection have been reported globally.</td>
<td>Laboratory making the diagnosis</td>
<td>Laboratories are to send monthly line lists of all patients with clinical specimens where a glycopeptide-resistant Staphylococcus aureus was isolated. Only include isolates when resistance was determined using confirmatory methods, including Etest, broth microdilutions test, or PCR (vanA, vanB, vanC1/vanC2, etc. detected). Resistance should be based on interpretation of minimum inhibitory concentrations according to EUCAST or CLSI guidelines

2021 guidelines for Staphylococcus aureus*
<table>
<tr><td>Antibiotic</td><td colspan="2">Resistance criteria (MICs in µg/mL)</td></tr>
<tr><td></td><td>CLSI</td><td>EUCAST</td></tr>
<tr><td>Vancomycin</td><td>≥16</td><td>>2</td></tr>
<tr><td>Teicoplanin</td><td>≥32</td><td>>2</td></tr>
</table>
*These guidelines are subject to change annually and therefore reporting should always be in line with the most recent recommendations.

In addition, laboratories are requested to report the total number of patients for which a microbiological culture test was done. If a patient has multiple cultures from the same specimen, they should be counted once. Similarly, if a patient has cultures done for multiple specimen type, they should be counted once.</td>
<td>A patient with Staphylococcus aureus that is resistant to vancomycin (±teicoplanin) cultured from any clinical specimen.
A 30-day period will be used to deduplicate patients with multiple subsequent pathogens isolated.</td>
</tr>
</table>

Category 4: Written or electronic notification within 1 month of diagnosing by private and public health laboratories.

COLISTIN-RESISTANT PSEUDOMONAS AERUGINOSA

<table>
<tr><th>Disease epidemiology</th><th>Who must notify</th><th>What to notify</th><th>Confirmed case definition</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr>
<td>Pseudomonas aeruginosa is a Gram-negative bacterium found everywhere in the environment and usually causes infections in people who are sick and are hospitalised. This bacterium can cause many types of infections, including bloodstream infections, surgical site infections and others. This bacterium can easily develop resistance to many classes antibiotics such as carbapenems, aminoglycosides and fluoroquinolones. When resistance to many antibiotic classes occurs at the same time, the bacteria is said to be multi-drug resistant or MDR. People who are infected with MDR Pseudomonas aeruginosa are often treated with colistin, but this bacterium is now developing resistance to colistin and patients in hospitals are increasingly infected with colistin-resistant Pseudomonas aeruginosa.</td>
<td>Laboratory making the diagnosis</td>
<td>Laboratories are to send monthly line lists of all patients with clinical specimens where a colistin-resistant Pseudomonas aeruginosa was isolated.
Only include isolates when resistance was determined using confirmatory methods; broth microdilutions test or PCR (mcr1, mcr2, mcr3, etc., detected).
Resistance should be based on interpretation of minimum inhibitory concentrations according to EUCAST or CLSI guidelines.

2021 guidelines for Pseudomonas aeruginosa *
<table>
<tr><td>Antibiotic</td><td colspan="2">Resistance criteria (MICs in µg/mL)</td></tr>
<tr><td></td><td>CLSI</td><td>EUCAST</td></tr>
<tr><td>Colistin</td><td>≥4</td><td>>2</td></tr>
</table>
* These guidelines are subject to change annually and therefore reporting should always be in line with the most recent recommendations.

In addition, laboratories are requested to report the total number of patients for which a microbiological culture test was done. If a patient has multiple cultures from the same specimen, they should be counted once. Similarly, if a patient has cultures done for multiple specimen type, they should be counted once.</td>
<td>A patient with Pseudomonas aeruginosa that is resistant to colistin cultured from any specimen type.
A 30-day period will be used to deduplicate patients with multiple subsequent pathogens isolated.</td>
</tr>
</table>

Category 4: Written or electronic notification within 1 month of diagnosing by private and public health laboratories.

COLISTIN-RESISTANT ACINETOBACTER BAUMANII

<table>
<tr><th>Disease epidemiology</th><th>Who must notify</th><th>What to notify</th><th>Confirmed case definition</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>Acinetobacter baumannii is a Gram-negative bacterium that cause infections in hospitalised patients. It can cause serious infections such as pneumonia, sepsis, urinary tract infection and wound infections. Patients who are in intensive care units or those who have undergone surgery or those who have received antibiotic treatment have a higher risk of developing infections with this bacterium. Acinetobacter baumannii has developed antibiotic-resistance to many antibiotic classes, including carbapenems. Colistin is the antibiotic that is usually used for patients who have infections with multi-drug resistant Acinetobacter baumannii. Unfortunately, increased use of colistin has led to Acinetobacter baumannii developing resistance to it. Up to 40% of patients with colistin-resistant Acinetobacter baumannii infections may die.</td><td>Laboratory making the diagnosis</td><td>Laboratories are to send monthly line lists of all patients with clinical specimens where a colistin-resistant Acinetobacter baumannii was isolated. Only isolates when resistance was determined using confirmatory methods; broth microdilutions test or PCR (mcr1, mcr2, mcr3, etc., detected).
Resistance should be based on interpretation of minimum inhibitory concentrations according to EUCAST or CLSI guidelines.

2021 guidelines for Acinetobacter baumannii *<table><tr><td>Antibiotic</td><td colspan="2">Resistance criteria (MICs in µg/mL)</td></tr><tr><td></td><td>CLSI</td><td>EUCAST</td></tr><tr><td>Colistin</td><td>≥4</td><td>>2</td></tr></table>* These guidelines are subject to change annually and therefore reporting should always be in line with the most recent recommendations.</td><td>A patient with Acinetobacter baumannii that is resistant to colistin cultured from any specimen type
A 30-day period will be used to deduplicate patients with multiple subsequent pathogens isolated.</td></tr>
</table>

Category 4: Written or electronic notification within 1 month of diagnosing by private and public health laboratories.

CLOSTRIDIOIDE (CLOSTRIDIUM) DIFFICILE

Disease epidemiology	Who must notify	What to notify	Confirmed case definition
Clostridioide (previously *Clostridium*) *difficile* is a Gram-positive bacterium that produces toxins that can cause disease in humans. This bacterium is the commonest cause of healthcare-associated infections globally and commonly affects patients who are receiving antibiotics for other infections. *Clostridioide difficile* lives in the gut and can cause mild to severe diarrhoea in patients who receive antibiotics. All antibiotic classes have been shown to cause infections with *Clostridioide difficile*. Patients with *Clostridioide difficile* infections can shed spores of this bacterium which can spread to other patients resulting in outbreaks in hospitals. The spores can be difficult to remove from the environment making outbreaks difficult to control. Some patients may develop severe infections such as toxic megacolon and die from this infection.	Laboratory making the diagnosis	Laboratories are to send monthly line lists of all patients with stool specimens were a toxin-producing *Clostridioide difficile* was isolated. Only toxin-producing *Clostridioide difficile* confirmed with one of the following tests should be sent: GDH antigen and toxin test OR Real-time PCR test for toxigenic *Clostridioide difficile* In addition, laboratories are to send the total number of stool tests for *Clostridioide difficile* (positive and negative). Only one test per patient should be counted in a 30-day period.	Patient with a stool specimen positive for toxigenic *Clostridioide difficile*. Only one positive test per patient in a 30-day period will be reported.