NICD HANDBOOK

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LABORATORY TEST INFORMATION HANDBOOK

Contents

This sop supersedes NIC0104

LABORATORY TEST INFORMATION HANDBOOK

Purpose:

Services Available

The National Institute for Communicable Diseases (NICD) is a communicable disease (medical microbiology/virology) surveillance facility and laboratory and falls within the control of the National Health Laboratory Service (NHLS).
The NICD has been established to function as a public health oriented, laboratory-based, national facility distinct from and independent of the existing microbiology/virology laboratories attached to academic centres throughout the country. The direction the NICD takes, is that of public health orientation, rather than a patient oriented clinical diagnostic entity and this is reflected in the service commitments and research directions carried out by the organization. The NICD is, to a large extent, modelled on internationally recognized public health laboratories such as the Centre for Disease Control & Prevention of the USA and Public Health England (former Health Protection Agency).

Scope:

To provide a guide to services offered at the NICD.

Location of the NICD

The NICD is a permanent laboratory and is located at: 1 Modderfontein Road, Sandringham, 2192.

Advice:

For medical advice contact the consultants from the relevant Centre.

For medical advice on investigation of haemorrhagic fevers contact the Medical Consultant to the Centre for Emerging Zoonotic and Parasitic diseases (contact details provided in Table)

Working Hours:

The laboratories at the NICD operate Monday to Friday from 07h30 to 16h30. For after-hour service, please contact the consultant. Please see Key Contact Staff Table

Special Pathogens Laboratory – for after-hour service, please contact the Medical consultant on call (or NICD Call/Emergency Phone number) or the Laboratory directly (contact details provided in Table).

Hotline:

For outbreak, clinical advice or public health queries:
NICD Clinical Advice Hotline +27 82 883 9920

Results:

Results queries please contact the Results Call Centre
011 386 6404
011 386 6314
011 386 6466

Fax 011 386 6342

Abbreviations

Abbreviation	Descriptions
BAL	Bronchoalveolar lavage
CDC	Centre for Disease Control and Prevention
CIF's	Case investigation forms
CMV	Cytomegalovirus
CSF	Cerebrospinal Fluid
ESKAPE	*Enterococcus faecium, Staphylococcus aureus, Klebsiella pneumonia, Acinetobater baumannii, Pseudomonas auruginosa, E. coli and Enterobacter cloacae.*
GERMS-SA	Group for Enteric, Respiratory and Meningeal Surveillance in South Africa
HPV	Human papillomavirus
HSV	Herpes Simplex Virus
LGV	Lymphogranuloma venereum
LIMS	Laboratory Information Management System
ILI	Influenza like Illness
NICD	National Institute for Communicable Diseases
NS	Nasal swab
NPA	Nasopharyngeal aspirate
NPS	Nasopharyngeal swab
OPA	Oropharyngeal aspirate
OPS	Oropharyngeal swab

RSVP	Respiratory PCR test
SADC	Southern African Development Community
TA	Throat Aspirate
Abbreviation	**Descriptions**
TAT	Turnaround Time
TP	*Treponema pallidum*
TS	Throat swab
TV	*Trichomonas vaginalis*
UTM	Universal Transport medium
URTI	Upper respiratory Tract Infection
VHF	Viral Haemorrhagic Fever
VTM	Viral transport medium
WHO	World Health Organization

Help Us to Help You

1. All specimens must be accompanied by the following clearly legible data:

   a) Patient name and hospital number (or referring laboratory reference number).

   b) Name and address of requesting clinician.

   c) Nature of specimen (specimen type)

   d) Collection date and time (where relevant).

   e) Tests requested.

   f) Brief clinical history.

   g) Case investigation forms (CIFs) to be completed for Polio and Measles surveillance, and VHF and rabies request (available on NICD webpage, A-Z disease list).

   h) Contact number/email for providing the laboratory report

2. Hard copies of all reports are sent to the requesting clinician by post or electronically for referred samples.

3. Reports can be telefaxed to “safe haven” fax machines on request. Please ensure that where required, this service is clearly requested and that a suitable fax number and contact person is supplied.

Where possible, the sender of category "A" specimens must notify the NICD testing laboratory via the NICD Hotline or the provided telephone numbers of the shipment of such samples prior to its arrival at the NICD.

Complaints and Queries

1. Complaints and queries of a minor nature should be addressed to the Laboratory concerned. (See Key Contact Staff Table)

2. Complaints and queries of a serious nature should be addressed to the head of the relevant Laboratory (See Key Contact Staff Table)

Please note that the TAT (Turnaround Time) quoted in this Handbook is calculated from the sample reception at the NICD until a report is issued.

NOTIFIABLE MEDICAL CONDITION (NMC)

Notifiable Medical Conditions are diseases that are of public health importance because they pose significant public health risks that can result in disease outbreaks or epidemics with high case fatality rates both nationally and internationally.

FOR ANY NMC RELATED QUESTIONS/QUERIES/CONCERNS?

NMC helpline: 072 621 3805

Email: NMCsurveillanceReport@nicd.ac.za

Fax: 086 639 1638

Website: www.nicd.ac.za

The NICD Testing Centres / Laboratories

Centre /Laboratories/ Departments	Laboratory	Contact Number
Centre Enteric Diseases (CED)	CED Bacteriology	011 555-0333 /0334
	CED Virology	011 555-0370
Centre for Emerging Zoonotic and Parasitic Diseases (CEZPD)	Electron Microscopy Laboratory	011 386 6318
	Antimalarial Resistance Monitoring and Malaria Operational	011 386 6364/6003
	Special Bacterial Pathogens Reference Laboratory (SBPRL)	011 555 0331
	Arbovirus Reference Lab	011 386 6424/6353
	Special Viral Pathogens Laboratory (SVPL)	011 386 6376
	Parasitology Reference Laboratory (PRL)	011 555 0311
	Vector control Reference Laboratory (VCRL)	011 386 6480
Centre for HIV & STI's (CHIVSTI)	Cell Biology Unit	011 386-6366
	HIV Virology	011 386 6341
	HIV Surveillance	011 386 6462
	STI Surveillance	011 555 0461
Centre for Vaccines and Immunology (CVI)	Hepatitis	011 386-6347
	COVID-19 Wastewater Surveillance	011 386 6461/011 555 0431
	Measles	011 386 6343/6398
	Polio Isolation and Culture Laboratory	011 555-0504
Centre for Healthcare-Associated Infections, Antimicrobial Resistance and Mycoses (CHARM)	Antimicrobial Resistance Laboratory-Culture Collection (AMRL-CC)	011 555 0342
	Mycology Reference Laboratory (MRL)	011 555 0325
	CHARM Molecular Laboratory (CML)	011 386 6395
Centre for Respiratory Diseases & Meningitis	GERMS-SA/microbiology	011 555 0315/7
	Molecular	011 555 0356/0387/0352

Centre /Laboratories/ Departments	Laboratory	Contact Number
(CRDM_	Virus isolation and serology	011 386 6390/6373
Centre for Tuberculosis (CTB)	TB Focus Programme & National TB Reference Laboratory	011 885 5316 /5317
Sequencing Core Facility	Sequencing Core facility	011 555 0450
NICD Sample Receiving office		011 386 6466
Division of Public Health, Surveillance and Response	Notifiable Medical Conditions (NMC)	072 621 3805
	(Outbreak response Unit)	079 8717278 +27 11 555 0542
	24/7Doctor on call/Outbreak Hotline	082 883 9920

Alphabetical order of tests offered at the NICD

Pathogen / Test Species Name (disease/ Syndrome)	Pathogen Species Name (disease/ syndrome, ICD-code)	Tests To Request	Department and Contact telephone no's
Arbovirus	Arbovirus: (Chikungunya, Dengue, West Nile,Rift Valley fever, Sindbis, Zika)	Arbovirus (Routine arbo screen, include serology for Chikungunya, West Nile, Sindbis, Rift Valley fever) Dengue and Zika for patient with travel history. PCR/Isolation for Acute cases only Arbovirus PCR *(specify which arbovirus, for example "Dengue PCR")* Arbovirus isolation Disease specific IgM or IgG ELISA	Arbovirus Reference Laboratory 011 386 6424/6353
Adenovirus	Adenovirus Gastroenteritis: Diarrhoea, vomiting, fever	Enteric Adenovirus detection	CED Virology 011 555 0370
Anthrax (ANTHR)	*Bacillus anthracis* (anthrax)	Anthrax (ANTHR)	Special Bacterial Pathogens Reference Laboratory 011 555 0331 011 555 0306
Arthropods/ Insects	Arthropods/ Insects	Morphological identification, PCR identification and/or ELISA	Vector Control Reference Laboratory 011 386 6480
Astrovirus	Astrovirus Gastroenteritis: Diarrhoea, vomiting, fever	Astrovirus detection	CED Virology 011 555 0370
Atypical pneumonia-causing pathogens	*M. pneumoniae*, *C. pneumoniae*, *Legionella* spp.	Atypical pneumonia pathogens (*M. pneumoniae*, *C. pneumoniae*, *Legionella* spp.)	CRDM 011 555 0315/011 555 0317
Avian Influenza (H5, H7, H9)	Avian Influenza (H5, H7, H9)	Suspected Avian influenza	Hotline-dr on call:082 883 9920 CRDM 011 555 0316 (Clinical) 011 386 6321 (Clinical)
Botulinum	*Clostridium botulinum* (botulism)	Botulinum	Special Bacterial Pathogens Reference Laboratory 011 555 0331/011 555 0306
Campylobacter spp	*Campylobacter* spp	Enteric surveillance and reference function	CED Bacteriology 011 386 6235/011 555 0348 011 555 0334/011 555 0426
Candida (surveillance)	Candida (surveillance)	Candida surveillance	CHARM Mycology Reference Laboratory

Pathogen / Test Species Name (disease/ Syndrome)	Pathogen Species Name (disease/ syndrome, ICD-code)	Tests To Request	Department and Contact telephone no's
			011 555 0325 /011 555 0381/011 555 0323
Chlamydia trachomatis	*Chlamydia trachomatis*	/ NAAT (PCR, TMA)	STI: 011 555 0461 \ 011 555 0468
Cryptococcus (surveillance)	Cryptococcus (surveillance)	Cryptoccocal surveillance	CHARM Mycology Reference Laboratory 011 555 0325/011 555 0384 /011 555 0323
Cryptococcus Meningitis	Identification of Cryptococcal antigen (CrAg)	Identification of Cryptococcal antigen (CrAg)	CHARM: Mycology Reference Laboratory 011 386-6430 /011 386-6431/011 555 0323
Diphtheria	*Corynebacterium diphtheriae*	Identification (phenotypic and PCR), and toxin production (Elek and PCR)	CRDM 011 555 0315 (lab) 011 555 0317 (lab)
E. coli characterization	Diarrhoeagenic *Escherichia coli* or suspected STEC	Enteric surveillance and reference function / E. *coli* characterization	CED Bacteriology 011 386 6235 /011 555 0348 011 555 0334/011 555 0426
Enterococcus faecium and *faecalis*	*Enterococcus faecium* and *faecalis*	AMR detection/confirmation	CHARM AMRL-CC 011 555 0344 / 011 555 0342
Enterovirus	Enterovirus	Enterovirus / PCR / Enterovirus genotyping	CVI Polio 011 386 6438 011 555 0504
Fungal pathogen from clinical sources which cannot be identified by academic/ referral laboratories	Fungal pathogen from clinical sources which cannot be identified by academic/ referral laboratories	Identification of fungal pathogen; Antifungal susceptibility testing	CHARM Mycology Reference Laboratory 011 555 0323 /011 555 0325 011 555 0353
Genital Discharge syndrome	*Neisseria gonorrhoeae* *Chlamydia trachomatis* *Trichomonas vaginalis* and *Mycoplasma genitalium*	Multiplex PCR for genital discharge pathogens Organism specific PCR available for confirmation of *Neisseria gonorrhoeae* *Chamydia trachomatis* *Trichomonas vaginalis* and *Mycoplasma genitalium*	STI 011 555 0461 011 555 0468
Genital Ulcer syndrome	*Treponema pallidum*, Herpes simplex virus 1 and 2, *Haemophilus ducreyi*, Lymphogranuloma venereum	Multiplex PCR for genital ulcer pathogens Organism specific PCR available for confirmation	STI 011 555 0461 011 555 0468
Gram-negative organisms (*As per current GERMS-SA case definition)	Gram-negative organisms (*As per current GERMS-SA case definition)	Surveillance	CHARM AMRL-CC 0115550344 0115550342
Haemophilus ducreyi	*Haemophilus.ducreyi*	PCR	STI: 011 555 0461 \ 011 555 0468
Hepatitis	Hepatitis: For research and surveillance only (For staff immunity screening, a request form for anti-HavabG, anti-HBs, is completed and must accompany the sample)	Hepatitis A: Havab-G and Havab-M Hepatitis B: HBsAg, Anti-HBs, Anti-HBc, HBeAg,Anti-HBe,Anti-HBc IgM, HBV Viral load Sequencing load,genotyping Hepatits C:	CVI hepatitis 011 386 6347 011 555 0534

Pathogen / Test Species Name (disease/ Syndrome)	Pathogen Species Name (disease/ syndrome, ICD-code)	Tests To Request	Department and Contact telephone no's
		Hepatitis C:Anti-HCV, HCV Viral load,genotyping	
Human Corona viruses (229E, OC43, NL63, HKU1)	Human Corona viruses (229E, OC43, NL63, HKU1)	Human coronaviruses	CRDM Results;011-386 6404 Queries:011 555 0488 011 386 6373 011 386 3690
Histoplasmosis	Histoplasma galactomannan antigen (HAT)	Histoplasma antigen	CHARM: Mycology Reference Laboratory 011 555 0325 /011 555 0323 011 555 0353 011 555 0491
HIV	HIV	HIV-1 Pooled Plasma	HIV Sero-Molecular: 011 386 6435 /011 386 6437 / 011 386 6460
HIV	HIV	CD4	HIV Sero-Molecular: 011 386 6435 /011 386 6437 / 011 386 6460
HIV	HIV	HIV Viral Load	HIV Sero-Molecular: 011 386 6435 /011 386 6437 / 011 386 6460
HIV	HIV	HIV ELISA	HIV Sero-Molecular: 011 386 6435 /011 386 6437 / 011 386 6457
HIV	HIV	HIV-1/2 Antigen-Antibody EIA	HIV Sero-Molecular: 011 386 6435 /011 386 6437 / 011 386 6457
HIV	HIV	HIV-1 or HIV-2 Western Blot	HIV Sero-Molecular: 011 386 6435 /011 386 6437 / 011 386 6457
HIV	HIV	Geenius HIV ½ Confirmatory Test (On Request Only)	HIV Sero-Molecular: 011 386 6435 /011 386 6437 / 011 386 6457
HIV	HIV	Alere Determine Combo Rapid (On Request Only)	HIV Sero-Molecular: 011 386 6435 /011 386 6437 / 011 386 6457
HIV	HIV	HIV Incidence Testing	HIV Sero-Molecular: 011 386 6435 /011 386 6437 / 011 386 6457
HIV-1	HIV-1 (p24)	P24 – Culture Supernatant	Virology Research Laboratory Lab Manager: 011 386 6341
HIV-1	HIV-1	Neutralization assays a) Pseudovirion assay	Virology Research Laboratory Lab Manager: 011 386 6341
HIV-1	HIV-1	Drug resistance testing a) In-House assay	Virology Research Laboratory Lab Manager: 011 386 6341
HIV-1	HIV-1	Gag ELISA	Virology Research Laboratory Lab Manager: 011 386 6341

Pathogen / Test Species Name (disease/ Syndrome)	Pathogen Species Name (disease/ syndrome, ICD-code)	Tests To Request	Department and Contact telephone no's
HIV-1	HIV-1	HIV Virus isolation	Virology Research Laboratory Lab Manager: 011 386 6341
HPV	HPV	PCR / Hybridisation	STI :011 555 0461 \ 011 555 0468
HSV 1 and 2	HSV 1 and 2	PCR; Acyclovir resistance testing by PCR/ sequencing & viral culture; and serum ELISA for HSV2 IgG	STI :011 555 0461 \ 011 555 0468
Influenza A and Influenza B virus.	Influenza A and Influenza B virus.	Respiratory panel	CRDM 011 555 0387/0352 (lab) 011 555 0316/011 386 6321 (clinical)
Leptospirosis (LEPTO)	*Leptospira spp.* (Leptospirosis)	Leptospirosis (LEPTO)	Special Bacterial Pathogens Reference Laboratory 011 555 0331/ 011 555 0306
Listeria spp	*Listeria spp*	Enteric surveillance and reference function / *Listeria* characterization	CED Bacteriology 011 386 6235 /011 555 0348 011 555 0334 /011 555 0426
Lympho granuloma Venereum (LGV)	*Lympho granuloma Venereum (LGV)*	PCR	STI :011 555 0461 \ 011 555 0468
MALDI-TOF identification	MALDI-TOF identification	Identification	CHARM AMRL-CC 0115550344/0115550342
Measles [cvi1] *Rash-based Surveillance*	Measles Rash-based Surveillance	Measles IgM	CVI measles working group 011 386 6343 011 386 6398 011 555 0534
Meningitis/encephalitis screen (bacterial and viral)	*S. pneumoniae, H. influenzae, N. meningitidis, S. agalactiae, E. coli* K1, *L. monocytogenes*, Cytomegalovirus, Enterovirus, Herpes simplex-1 and -2, Human herpesvirus 6, Human Parechovirus, Varicella zoster virus	Meningitis/encephalitis screen – PCR Culture (bacterial pathogens) Serotyping/grouping of Spn, Hi and Nm – phenotypic (for culture) and PCR (directly from clinical specimen) MIC – bacterial culture	CRDM 011 555 0315/0317/0327/0387 (lab queries) 011 555 0316 (clinical queries)
MERS-Coronavirus (MERS-CoV)	MERS-Coronavirus (MERS-CoV)	Suspected MERS-Coronavirus (MERS-CoV) PCR	Hotline-Dr on call:082 883 9920 CRDM 011 555 0387/0352 (lab) 011 555 0316/011 386 6321 (clinical)
Monkeypox	Monkeypox virus	Monkeypox	Special Viral Pathogens Laboratory Dr J Weyer: 011 386 6376 / 082 903 9131 NICD Hotline
Multi-drug resistant *Enterobacteriaceae and other ESKAPE pathogens for surveillance and detection (*As per current GERMS-SA case definition)*	Multi-drug resistant Enterobacteriaceae (*As per current GERMS-SA case definition and case report forms)	Cultures on Dorset slopes viable for up to one month at room temperature for surveillance or reference diagnostic	CHARM AMRL-CC 0115550344 /0115550342
Mycobacterium tuberculosis	*Mycobacterium tuberculosis*	Microscopy for acid-fast bacilli	Centre for TB 011 885 5317/011 885 5316

Mycobacterium tuberculosis	*Mycobacterium tuberculosis or* Non-tuberculosis mycobacteria	Culture	Centre for TB 011 8855317/011 885 5316
Mycobacterium tuberculosis	*Mycobacterium tuberculosis*	Phenotypic drug susceptibility testing (Specify drugs to be tested)	Centre for TB 011 885 5317/011 885 5316
Mycobacterium tuberculosis	*Mycobacterium tuberculosis or* Non-tuberculosis mycobacteria	Line Probe Assay - First line drug susceptibility - Second line drug susceptibility - NTM speciation - MTBcomplex speciation - NTM- drug susceptibility	Centre for TB 011 885 5317/011 885 5316

Pathogen / Test Species Name (disease/ Syndrome)	**Pathogen Species Name (disease/ syndrome, ICD-code)**	**Tests To Request**	**Department and Contact telephone no's**
Mycobacterium tuberculosis	*Mycobacterium tuberculosis*	Xpert MTB/RIF Assay	Centre for TB 011 885 5217/011 885 5316
Mycobacterium tuberculosis	*Mycobacterium tuberculosis or* Non-tuberculosis mycobacteria	**Specialised testing** Only on request via email to NTBRL. -Broth Microdilution or MGIT MIC testing. -Extended Panel for TB MIC testing for NTM. -MIC testing for Bedaquiline and / or Delamanid. - Next generation sequencing	Centre for TB 011 885 5317/011 885 5316
Mycoplasma genitalium	*Mycoplasma genitalium*	NAAT (PCR, TMA)	STI: 011 555 0461 /011 555 0468
Mycoplasma pneumoniae, Chlamydia pneumoniae, Legionella spp., Bordetella spp.	*Mycoplasma pneumoniae, Chlamydia pneumoniae, Legionella spp., Bordetella spp.*	Polymerase chain reaction (PCR) for identification	CRDM 011 555 0315 011 555 0317
Neisseria gonorrhoeae	*Neisseria gonorrhoeae*	Culture and Antimicrobial susceptibility testing / NAAT (PCR, TMA)/ Typing by PCR / Antimicrobial resistant determinants testing by PCR	STI: 011 555 0461 /011 555 0468
Norovirus	Norovirus Gastroenteritis: Diarrhoea, vomiting, fever	Norovirus detection	CED Virology 011 555 0370
Parasite - Acanthamoeba spp.	Parasite *Acanthamoeba spp.*	Acanthamoeba	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Babesia species (Babesiosis)	Parasite *-Babesia* species (Babesiosis)	Babesia	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Borrelia duttoni or B. recurrentis (Relapsing fever)	Parasite *-Borrelia duttoni* or *B. recurrentis* (Relapsing fever)	Relapsing fever Borrelia	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Entamoeba histolytica	Parasite *-Entamoeba histolytica* (Amoebiasis)	Amoebiasis	Parasitology Reference Laboratory 011 555-0304 011 555-0311

Parasite -Echinococcus species	Parasite -*Echinococcus* species (Echinococcosis, hydatid disease)	Echinococcus	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Enterobius vermicularis (pinworm)	Parasite -*Enterobius vermicularis* (pinworm)	*Enterobius vermicularis/* (pinworm)	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Human cestodes (tapeworms) including: Taenia saginata, T. solium, H. nana, H. diminuta and D. latum	Parasite -Human cestodes (tapeworms) including: *Taenia saginata, T. solium, H. nana, H. diminuta* and *D. latum*	Stool parasites (specify suspected parasite, if applicable)	Parasitology Reference Laboratory 011 555-0304 011 555-0311

Pathogen / Test Species Name (disease/ Syndrome)	Pathogen Species Name (disease/ syndrome, ICD-code)	Tests To Request	Department and Contact telephone no's
Parasite -Human nematodes including: Ascaris lumbricoides (common roundworm), hookworms (Ancylostoma duodenale/ Necator americanus), Trichuris trichiura	Parasite -Human nematodes including: *Ascaris lumbricoides* (common roundworm), hookworms (*Ancylostoma duodenale/ Necator americanus*), *Trichuris trichiura* (whipworm), *Strongyloides stercoralis*	Stool parasites (specify suspected parasite, if applicable)	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Human protozoa including: Cryptosporidium species, Cystoisosporal belli, Cyclospora cayetanensis, Giardia lamblia, Entamoeba coli,	Parasite -Human protozoa including: *Cryptosporidium species, Cystoisosporal belli, Cyclospora cayetanensis, Giardia lamblia, Entamoeba coli, Blastocystis hominis*	Stool parasites (specify suspected parasite, if applicable)	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Human trematodes including: Schistosoma mansoni/ haematobium	Parasite -Human trematodes including: *Schistosoma mansoni/ haematobium* (Bilharzia, schistosomiasis)	Stool / urine parasites (specify suspected parasite, if applicable)	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Leishmania species	Parasite -*Leishmania* species (Leishmaniasis)	Leishmania investigation	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Microfilaria species (W. bancrofti, L. loa, M. perstans etc)	Parasite -Microfilaria species (*W. bancrofti, L. loa, M. perstans* etc)	Microfilaria investigation	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite – Microsporidia (unicellular intracellular parasites closely related to fungi)	Microsporidia including *Enterocytozoon bieneusi, Encephalitozoon* species	Microsporidia investigation	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Plasmodium falciparum	Parasite -*Plasmodium falciparum* (Malaria)	Antigen test for *Plasmodium falciparum*	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Plasmodium species	Parasite -*Plasmodium* species (Malaria)	Malaria investigation	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Plasmodium species	Parasite -*Plasmodium* species (Malaria)	Malaria PCR	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite - Plasmodium falciparum	Parasite - *Plasmodium falciparum* (Malaria)	Antimalarial Drug and Diagnostic Resistance Assessment by PCR	ARMMOR 011 386 6374 / 011 386 6003
Parasite -Pneumocystis jirovecii	Parasite -*Pneumocystis jirovecii* (*Pneumocystis* pneumonia, PCP)	*Pneumocystis jirovecii* PCR	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Schistosoma haematobium	Parasite -*Schistosoma haematobium* (Schistosomiasis, bilharzia)	*Schistosoma haematobium*	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Strongyloides stercoralis	Parasite -*Strongyloides stercoralis*	*Strongyloides stercoralis*	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Tapeworm (adult) identification	Parasite -Tapeworm (adult) identification	Tapeworm identification	Parasitology Reference Laboratory 011 555-0304 011 555-0311

Pathogen / Test Species Name (disease/ Syndrome)	Pathogen Species Name (disease/ syndrome, ICD-code)	Tests To Request	Department and Contact telephone no's
Parasite - Toxoplasma gondii (protozoan)	*Toxoplasma gondii*	Toxoplasma PCR	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Trypanosoma species	Parasite -*Trypanosoma* species (Sleeping sickness or trypanosomiasis)	Trypanosome investigation	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Pertussis	*Bordetella pertussis*	*B. pertussis* culture and/or PCR	CRDM 011 555 0315/011 555 0317 (lab) 011 555 0316/011 386 6321 (clinical queries)
Poliovirus isolation Environmental surveillance.	Poliovirus Environmental surveillance.	Poliovirus Environmental Surveillance	Poliovirus ES: 011 555 0504/ 011 386 6358/011 386 6451
Pneumonia screen (molecular)	Adenovirus, coronavirus, human metapneumovirus, rhinovirus/EV, influenza A and B, parainfluenza virus, RSV, *A. baumanii complex, E. cloacae complex, E. coli, H. influenzae, K. aerogenes, K. oxytoca, K. pneumoniae group, M. catarrhalis, Proteus spp., P. aeruginosa, S. marcescens, S. aureus, S. agalactiae, S. pneumoniae, S. pyogenes, C. pneumoniae, L. pneumophila, M. pneumoniae*	Pneumonia screen - PCR	CRDM 011 555 0315/011 555 0317/011 555 0387
Poliovirus	Poliovirus	Real Time RT-PCR and/or Sequencing	Centre for Vaccines & Immunology: Polio Laboratory 011 386 6438 011 555 0504
Poliovirus isolation. AFP surveillance.	Poliovirus	Poliovirus isolation. AFP surveillance. Poliovirus Poliovirus isolation. AFP surveillance.	Poliovirus Isolation 011 555 0504/ 011 386 6361 011 386 6358
Poliovirus isolation. AFP surveillance	Poliovirus (Acute Flaccid Paralysis (AFP)surveillance)	Poliovirus isolation. AFP surveillance	Poliovirus Isolation 011 555 0504/011 386 6361 011 386 6358
Poliovirus Serology	Poliovirus Serology	Poliovirus Antibody Neutralization	Poliovirus Serology 011 555 0504/ 011 386 6361

Pathogen / Test Species Name (disease/ Syndrome)	Pathogen Species Name (disease/ syndrome, ICD-code)	Tests To Request	Department and Contact telephone no's
Poliovirus isolation. AFP surveillance.	Poliovirus Acute Flaccid Paralysis (AFP) surveillance)	Poliovirus isolation. AFP surveillance.	Poliovirus Isolation 011 555 0504/011 386 6361 011 386 6358
Poliovirus Serology	Poliovirus Serology	Poliovirus Antibody Neutralization	Poliovirus Isolation 011 555 0504/011 386 6361
Rabies	Rabies Rabies and rabies-related lyssaviruses) ICD-10 code is A82	Rabies	Center for Emerging Zoonotic and Parasitic Diseases, Special Viral Dr J Weyer:011 386 6376 082 903 9131 NICD Hotline
Rabies immunity (for individuals with pre-exposure rabies vaccination)	Rabies antibodies	Rabies immunity	Center for Emerging Zoonotic and Parasitic Diseases, Special Viral Dr J Weyer:011 386 6376 082 903 9131 NICD Hotline
Respiratory screen (molecular)	Respiratory screen – PCR RhinovirusRespiratory coronavirus (229E, HKU1, OC43, NL63), MERS-CoV, SARS-CoV-2, human metapneumovirus, rhinovirus, parainfluenza 1-4, Bordetella pertussis, B. parapertussis, C. pneumoniae, M. pneumoniae	Respiratory screen - PCR	CRDM 011 555 0315/17/ 0327/0387 (lab)
Rotavirus	Rotavirus Gastroenteritis: Diarrhoea, vomiting, fever	Rotavirus detection /Rotavirus genotyping	CED Virology 011 555 0370
Rubella (done as a reflex test for Measles) CVI2,CVI3	See measles	See measles	CVI measles working group 011 386 6398 011 555 0534 011 386 6343
Salmonella	*Salmonella* Typhi *Salmonella* Paratyphi A, B and C Nontyphoidal *Salmonella*	Enteric surveillance and reference function / *Salmonella* characterization	CED Bacteriology 011 386 6235 /011 555 0348 011 555 0334 /011 555 0426

Pathogen / Test Species Name (disease/ Syndrome)	Pathogen Species Name (disease/ syndrome, ICD-code)	Tests To Request	Department and Contact telephone no's
Sapovirus	Sapovirus Gastroenteritis: Diarrhoea, vomiting, fever	Sapovirus detection	CED Virology 011 555 0370
SARS-CoV-2 (COVID-19) (Coronavirus disease 2019)	SARS-CoV-2 (COVID-19)	SARS-CoV-2 (COVID-19)	CRDM 011 555 0315/17/ 0327/0387 (lab) 011 555 0316/ 011 386 6321
Severe fever with thrombocytopenia syndrome (SFTS)	SFTS	SFTS PCR	Centre for Emerging Zoonotic and Parasitic Diseases, Special Viral Dr J Weyer:011 386 6376 082 903 9131 NICD Hotline
Shigella spp	*Shigella spp*	Enteric surveillance and reference function / *Shigella* characterization	011 386 6235 /011 555 0348 011 555 0334 /011 555 0426
Streptococcus Group A and B	*Streptococcus agalactiae* (GBS) *Streptococcus pyogenes* (GAS)	Culture and PCR confirmation and serotyping of GBS	CRDM 011 555 0315 011 555 0317 011 555 0316/011 386 6321 (clinical queries)
Treponema pallidum	*Treponema pallidum*	RPR/TPPA/ PCR / Typing/ Antimicrobial resistant determinants testing by PCR / Macrolide resistance testing by PCR/ Sequencing	STI: 011 555 0461\ 011 555 0468
Urinary antigen test for identification	*Legionella pneumophila serogroup 1*	Urinary antigen test for detection of pathogen	CRDM 011 555 0315/011 555 0317
Viral haemorrhagic fever(VHF)	Viral haemorrhagic fevers (Crimean-Congo haemorrhagic fever, Ebola, Marburg, Lassa, Hanta and Yellow fever)ICD-10 code for unspecified viral haemorrhagic fever, A99	VHF	Centre for Emerging Zoonotic and Parasitic Diseases, Special Viral Dr J Weyer:011 386 6376 082 903 9131 NICD Hotline
Yersinia pestis *(Plague*	*Yersinia pestis* (Plague)	Plague (PLAGE) Plague serology (PLAGE) / Plague surveillance (RATS)	Special Bacterial Pathogens Reference Laboratory 011 555 0331/ 011 555 0306

CVI1: Please note that Measles IgG should not be requested by users of the service as it is only done for NICD staff immunity screening

CVI2: Please note that the Rubella IgM test should not be requested by users of the service as it is not offered as a single test, the Rubella IgM is done as part of the testing for national measles surveillance for the Expanded Programme on Immunization (EPI), every sample that is sent for a suspected measles case will be tested for both measles and rubella IgM

CVI3: Please note that Rubella IgG should not be requested by users of the service as it is only done for NICD staff immunity screening.

Notifiable Medical Conditions (NMC) Disease List

CATEGORY 1 NOTIFIABLE MEDICAL CONDITIONS – Category 1 notifiable medical conditions that require immediate reporting by the most rapid means available upon diagnosis followed by a written or electronic notification to the Department of Health within 24 hours of diagnosis by health care providers, private health laboratories or public health laboratories * Food -borne disease outbreak is the occurrence of two or more cases of a similar foodborne disease resulting from the ingestion of a common food. * *Examples of novel respiratory pathogens include novel influenza A virus and MERS coronavirus. * ** Viral haemorrhagic fever diseases include Ebola or Marburg viruses, Lassa virus, Lujo virus, new world arena viruses, Crimean -Congo haemorrhagic fever or other newly identified viruses causing haemorrhagic fever.
Acute flaccid paralysis
Acute rheumatic fever
Anthrax
Botulism
Cholera
Diphtheria
Enteric fever (typhoid or paratyphoid fever)
Food borne disease outbreak*
Haemolytic uraemic syndrome (HUS)
Listeriosis
Malaria
Measles
Meningococcal disease
Pertussis
Plague
Poliomyelitis
Rabies (human)
Respiratory disease caused by a novel respiratory pathogen**
Rift Valley fever (human)
SARS-CoV-2 (COVID-19)
Smallpox

Viral haemorrhagic fever diseases***
Yellow fever
CATEGORY 2 NOTIFIABLE MEDICAL CONDITIONS –   Category 2 notifiable medical conditions to be notified through a written or electronic notification to the Department of Health within seven (7) days of clinical or laboratory diagnosis by health care providers, private health laboratories or public health laboratories
Agricultural or stock remedy poisoning
Bilharzia (schistosomiasis)
Brucellosis
Congenital rubella syndrome
Congenital syphilis
Haemophilus influenzae type B
Hepatitis A
Hepatitis B
Hepatitis C
Hepatitis E
Lead poisoning
Legionellosis
Leprosy
Maternal death (pregnancy, childbirth and puerperium)
Mercury poisoning
Mercury poisoning
Soil transmitted helminths (*Ascaris lumbricoides, Trichuris trichiuria, Ancylostoma duodenale* and *Necator americanus*)
Tuberculosis: pulmonary
Tuberculosis: extra-pulmonary
Tuberculosis: multidrug-resistant (MDR-TB)
Tuberculosis: extensively drug-resistant (XDR-TB)
CATEGORY 3 NOTIFIABLE MEDICAL CONDITIONS –   Category 3 notifiable medical conditions to be notified through a written or electronic notification to the Department of Health within 7 days of diagnosis by private and public health laboratories
Ceftriaxone-resistant *Neisseria gonorrhoea*
West Nile virus, Sindbis virus, Chikungunya virus (i.e. endemic arboviruses)
Dengue fever virus, other imported arboviruses of medical importance (i.e. non-endemic)
Salmonella spp. other than S. Typhi and S. Paratyphi
Rubella virus

Shiga toxin-producing Escherichia coli	
Shigella spp.	
CATEGORY 4 NOTIFIABLE MEDICAL CONDITIONS – Category 4 notifiable medical conditions to be notified through a written or electronic notification to the Department of Health within 1 month of diagnosis by private and public health laboratories	
Healthcare-associated infections or multidrug- resistant organisms of public health importance	· Carbapenemase-producing Enterobacteriaceae
	· Vancomycin-resistant enterococci
	· Staphylococcus aureus: hGISA and GISA
	· Colistin-resistant Pseudomonas aeruginosa
	· Colistin-resistant Acinetobacter baumanii
	· Clostridium difficile

Tests offered at the NICD by Centre

Centre for Vaccines and Immunology (CVI)

Pathogen Species Name (disease/ syndrome)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Poliovirus (Acute Flaccid Paralysis (AFP) surveillance) **Note:** For purposes of AFP surveillance, the Poliovirus Isolation Laboratory at NICD is the only laboratory in South Africa accredited by World Health Organization to perform this testing.	Two stool samples (adult thumb size) collected in universal sample containers, 24-48 hours apart and within 14 days of onset of paralysis. In the event a stool sample cannot be obtained, please forward a rectal swab as an alternative.	Maintenance of cold chain (2-8°C) from collection to receipt at NICD. Samples to reach laboratory within 3 days of collection. **Note**: These are guidelines met to comply with WHO requirements; however samples will be subjected to processing and testing even if these criteria are not met with relevant details captured accordingly.	Poliovirus isolation. AFP surveillance.	Virus Isolation	EPI Notification 14 days (80% of all results to be reported within 14 days of receipt in lab). Issue of LIMS report: 21 days of receipt in lab.	The following information is required for capture on the AFP database and should be completed on specific AFP case investigation forms: • Epid number – unique number for epidemiology purposes • Name • Date of Birth • Date of onset of paralysis • Date of stool collection • Immunization history • Province • District • Case or contact • Specimen number • Date sent from field to National Level – where applicable • Date received at National Level – where applicable • Date sent to NICD • Testing requested and clinical diagnosis to be clearly stated to prevent incorrect / unnecessary tests being performed	Poliovirus Laboratory 011 555 0504 011 386 6361 011 386 6358 011 386 6438

Pathogen Species Name (disease/ syndrome)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Poliovirus	Virus isolate from stool or environmental sample, minimum 1ml. FTA Card inoculated with virus isolate	Transport frozen or at 4°C. Specimen must reach the laboratory within 3 days of dispatch. Transport at ambient temperature. Specimen must reach the laboratory within 3 days of dispatch.	Real Time RT-PCR Sequencing	Real Time ITD RT-PCR Real Time VDPV Screening RT-PCR Sequencing VP1 Region	7 days 7 days	AFP Investigation Form with at least the following information: • Epid Number • Patient Name • Date of onset of paralysis • District • Case or contact • Specimen Number • Referring Laboratory specimen number • Date sent to NICD • Cell Line (L-Arm or R-Arm) Real Time PCR Results (if requesting Sequencing)	Centre for Vaccines & Immunology: Polio Laboratory 011 386 6438 011 555 0504
Poliovirus Serology	Clotted Blood - 5ml, Sera - 0.5ml	Maintenance of cold chain (2-8°C)	Poliovirus Antibody Neutralization	Neutralization Test	21 days NB: Samples are batched for testing. This may result in TATs being exceeded if not stated as urgent.	Testing requested and clinical diagnosis to be clearly stated on request forms to prevent incorrect / unnecessary tests being performed	Poliovirus Serology 011 555 0504 011 386 6361 011 386 6358
Enterovirus	Hand foot and mouth disease: Dextran swab of vesicle/rash fluid with a stool sample Meningitis/encephalitis: CSF with a stool sample Respiratory disease: throat swab/lavage with a stool sample Gastroenteritis/diarrhoea: Stool sample/rectal swab	Transport frozen or at 4°C. Specimen must reach the laboratory within 3 days of dispatch.	Enterovirus PCR Enterovirus genotyping	Real-time PCR Sequencing of VP1 region	7 Days 14 days	Cold chain essential for the storage and transport of samples	Centre for Vaccines & Immunology: Polio Laboratory 011 386 6438 011 555 0504

Pathogen Species Name (disease/ syndrome)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Poliovirus (Environmental surveillance)	Sewage wastewater sample. Collected in an external screw cap 1 litre bottle.	Maintain cold chain transportation at 4°C	Poliovirus environmental isolation. Poliovirus Environmental Surveillance Note: Poliovirus isolation in environmental wastewater samples is performed on pre-selected wastewater treatment works following site selection as per WHO selection criteria (recommended) and evaluation of site by selected stakeholders. Please contact the laboratory for detailed information regarding site selection and poliovirus environmental surveillance.	Virus Isolation	Environmental Surveillance, 80% of results must be available within 21 days of receipt	The following information is required for capture on the ES database and should be completed on Poliovirus Environmental Surveillance Forms: □ID code – unique number for epidemiology purposes □Site Name □Sampling Method □Time sample collected □Date sample collected □Atmospheric temperature at time of sample collection □Province □District □Date sent to the laboratory	Polio Environmental Laboratory 011 555 0504 011 386 6358 011 386 6388 011 386 6451

Pathogen Species Name (disease/ syndrome)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Measles (Rash-based Surveillance)	5 ml Clotted Blood or EDTA Blood (red top or yellow SST tube or EDTA/heparin Blood or Serum	The blood/serum samples can be transported at room temperature to NICD. If transportation is delayed the samples should be refrigerated Samples to reach the lab within three days of sample collection	Measles IgM	Anti-Measles IgM antibody (EIA)	7 working days	A Measles Case Investigation Form (CIF) must be completed in full and must accompany specimens. Please ensure that the following information is captured on the CIF: • Name, age, Date of Birth , address of patient • Name and contact number of clinician • Symptoms marked in tick boxes • Complications marked in tick boxes • Date of onset of rash • Date seen at health facility • Date specimen collected • Medical history including measles vaccination history, number of doses and date of last measles vaccination Date of notification and response to case	CVI measles working group 011 386 6398 011 555 0534 011 386 6343
Rubella (Rash based surveillance)	5 ml Clotted Blood or EDTA Blood (red top or yellow SST tube or EDTA/heparin Blood or Serum	Same as for measles	See note on page 18 under Measles & Rubella	Anti-Rubella IgM antibody (EIA)	7 working days	Same as for Measles	CVI measles working group 011 386 6398 011 555 0534

Pathogen Species Name (disease/ syndrome)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Measles	Throat swab Throat swabs should be collected from all suspected cases	Transport at 2°C-8°C Sample should reach laboratory within 3 days	For surveillance only	RT-PCR Sequencing	14 days 14 days	Surveillance only. Case Investigation Forms (CIF) must be completed in full and must accompany specimens.	CVI measles working group 011 386 6343 011 386 6398 011 555 0534
Hepatitis	Serology: 5 ml Clotted Blood or EDTA Blood (red top or yellow SST tube or EDTA Blood or Serum) Molecular: 5ml EDTA blood	Transport at 2°C-8°C Sample should reach laboratory within 3 days	For research and surveillance only (anti-HAV, anti-HBs for staff immunity screening)	Hepatitis A: Architect System Havab IgG, Havab IgM Hepatitis B: Architect System HBsAg,Anti-HBs,Anti-HBc, HBeAg,Anti-HBe,Anti-HBc IgM, HBV Viral load,genotyping Hepatits C: Architect System Anti-HCV, HCV Viral load,genotyping	Serology:14 working days Molecular:21 working days	For research and surveillance only (Anti-HBs the staff immunity screening request form is completed and must accompany the specimen)	CVI hepatitis working group 011 386 6347 011 555 0534

Centre for Tuberculosis

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Mycobacterium tuberculosis	Sputum or other human sample	Cool ambient temperature Specimens should be collected in clean leak proof containers free from paraffin and other waxes or oils. Specimens should be kept cool during transportation but should not be frozen. If there is a delay in transport, the specimen should be refrigerated (2-8^{o}C) An adequate sample should be about 2-5ml sputum.	Microscopy for acid-fast bacilli	Microscopy for acid-fast bacilli	90% within 48-72hours	Test limited for surveillance and research projects	Centre for TB 011 885 5323 011 885 5316

Centre for Tuberculosis

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Mycobacterium tuberculosis or Non-tuberculous mycobacteria	Sputum or other human samples type	Specimens should be collected in clean leak proof containers free of oils. Study specific containers may be used. Sputum should be from deep cough avoiding saliva and secretions from nasopharynx. Specimens should be kept cool during transportation but should not be frozen. If there is a delay in transport, the specimen should be refrigerated (2-8ºC) An adequate sample should be about 2-5ml sputum.	Culture	Culture	Project dependant	Test limited for surveillance and research projects	Centre for TB 011 8855323 011 885 5316

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Mycobacterium tuberculosisor Non-tuberculous mycobacteria	Isolate in MGIT tubes (or other liquid media) and on solid media	Isolates should be packaged as a biohazard category A (triple packaging)	Drug susceptibility testing (Specify drugs to be tested)	Drug susceptibility testing (MGIT 960)	3-8 weeks from pure positive sub-culture or Project dependant	Extended TB DST should be requested via email to the pathologist.	Centre for TB 011 885 5323 011 885 5316
Mycobacterium Tuberculosisor Non-tuberculous mycobacteria	Sputum (or other samples type) and/or culture (liquid/solid)	Cool ambient temperature Specimens should be collected in clean leak proof containers free from paraffin and other waxes or oils. Specimens should be kept cool during transportation but should not be frozen. If there is a delay in transport, the specimen should be refrigerated (2-8ºC) An adequate sample should be about 2-5 ml sputum. For isolates these should be packaged as biohazard category A (triple packaging)	Line Probe Assay First line drug susceptibility Second line drug susceptibility - NTM speciation - MTB complex speciation (BCG) - NTM- drug susceptibility	Molecular testing methods GenoType MTBDRplus, GenoType MTBDRsl, , GenoType CM GenoType MTBC GenoType NTM DR	2-7 days specimen or AFB positive culture or Project dependant	Culture isolates these should be packaged as a biohazard category A (triple packaging)	Centre for TB 011 885 5323 011 885 5316

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Mycobacterium tuberculosis	Sputum or other specimen or decontaminated sediment	Cool ambient temperature Specimens should be collected in clean leak proof containers free from paraffin and other waxes or oils. Specimens should be kept cool during transportation but should not be frozen. If there is a delay in transport, the specimen should be refrigerated (2-8ºC) An adequate sample should be about 2-5ml sputum.	Xpert MTB/RIF Ultra Assay	Molecular testing methods	48-72 hours or Project dependant		Centre for TB 011 885 5217 011 885 5316
Mycobacterium tuberculosis or Non-tuberculosis mycobacteria	Isolate in MGIT tubes (or other liquid media) and on solid media	Isolates should be packaged as a biohazard category A (triple packaging)	***Specialised testing*** -Broth Microdilution or agar proportion or MGIT MIC testing. -Extended Panel for MTB -MIC testing for Bedaquiline, Clofazimine and / or Delamanid. MIC testing for NTM.	Advanced DST Methods Bedaquiline MIC testing Clofazimine MIC testing Delamanid MIC testing Extended TB DST Sensitire: –MYCOTB (MTB) –Rapid grower NTM –Slow grower NTM	3-8 weeks from pure positive sub-culture or Project dependant	Extended DST / MIC requests should be done via email to the pathologist.	Centre for TB 011 885 5323 011 885 5316

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Mycobacteria	Clinical specimen (pulmonary or extrapulmonary) or pure cultured isolate obtained from growth media(liquid or solid) or contaminated cultured isolate (provided the presence of mycobacteria)	Isolates should be packaged as a biohazard category A (triple packaging)	***Specialised testing*** -Whole Genome Sequencing - targeted NGS	Next Generation Sequencing	Project dependant	Only on request via email to the pathologist	Centre for TB 011 885 5323 011 885 5316

Centre for HIV and STI

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Bacterial vaginosis	Vaginal smear	Transport at ambient temperature		Gram stain		Only available for surveillance and research purposes	STI 011 555 0461 011 555 0468
Candida species	Vaginal smear	Transport at ambient temperature		Gram stain		Only available for surveillance and research purposes	STI 011 555 0461 011 555 0468
Herpes Simplex Type 2	Clotted Blood EDTA Blood Serum Plasma	Transport on ice		HSV2 IgG EIA	Project Dependant	Only available for Surveillance purposes and research projects	STI 011 555 0461 011 555 0468
Herpes Simplex Virus Type 1 and 2	Ulcer swab (Dacron)	Transport on ice or frozen	HSV PCR	PCR	10 days	Only available for Surveillance purposes and research project Special cases: persistent/ recurrent genital ulcer disease (require prior consultation with STI Section staff &completion of specific request form)	STI 011 555 0461 011 555 0468
Herpes Simplex Virus Type 1 and 2 acyclovir resistance testing	Ulcer swab (Dacron): 1 swab in viral transport medium 1 swab in dry sterile container	Transport on ice	HSV PCR and sequencing for thymidine kinase +/- DNA polymerase mutations HSV viral culture and acyclovir plaque reduction assay	PCR + sequencing and viral culture	Project Dependant	Only available for Surveillance purposes and research project Special cases: persistent/ genital ulcer disease non-responsive to acyclovir therapy (require prior consultation with STI Section staff &completion of specific request form	STI 011 555 0461 011 555 0468

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Genital Ulcer Disease	Ulcer swab (Dacron)	Transport on ice or frozen	Multiplex PCR for genital ulcer pathogens Organism-specific PCR available for confirmation of HSV and LGV	PCR	10 days	Available for Surveillance purposes and research projects Special cases: persistent/ recurrent genital ulcer disease (require prior consultation with STI Section staff & completion of specific request form)	STI 011 555 0461 011 555 0468
Genital Discharge	Urethral swab Vaginal swab Other samples as indicated by clinical presentation Endocervical swab Rectal swab Pharyngeal swab (Dacron swabs)	Transport on ice or frozen	Multiplex PCR for genital discharge pathogens Organism specific PCR available for confirmation of *Neisseria gonorrhoeae* *Chamydia trachomatis* *Trichomonas vaginalis* and *Mycoplasma genitalium*	PCR	10 days	Available for Surveillance purposes and research projects Special cases: persistent/ recurrent genital discharge or suspected treatment failure for gonorrhoea: *sexual abuse/ assault (require prior consultation with STI Section staff & completion of specific request form)	STI 011 555 0461 011 555 0468

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Neisseria gonorrhoeae culture isolate	Viable culture isolate on sealed agar plate For AST and confirmation of ceftriaxone-resistance, additionally inoculate: chocolate agar slope (overnight incubation in CO_2) AND Trypticase soy broth with 10% glycerol (frozen at -20ºC or -70°C) and transported on ice		Identification Antimicrobial Susceptibility Testing (AST) Confirmation of extended-spectrum cephalosporin resistance	Culture, phenotypic ID, PCR Culture, ID, AST (E-test and agar dilution) Culture, ID, AST (E-test and agar dilution) + antimicrobial resistance determinants testing by PCR	7 days	Sexual abuse/ assault case • Two different phenotypic confirmatory methods should be performed on culture isolate at the local NHLS laboratory • *Refer swab specimen for multiplex PCR for genital discharge pathogens, if required (see above) Suspected treatment failure for gonorrhoea or extended-spectrum cephalosporin resistance (require prior consultation with STI Section staff & completion of specific request form) Ceftriaxone-resistant gonorrhoea is a notifiable medical condition (Category 3). All clinical isolates identified as resistant to ceftriaxone (+/- cefixime) on phenotypic AST should be referred to STI Reference laboratory, NICD, for confirmation of resistance (requires completion of specific request form)	STI 011 555 0461 011 555 0468

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
HIV	Plasma in EDTA or ACD tube	Frozen 1ml Plasma (-20ºC) or Whole blood to be separated within 24 hours of collection	HIV-1 Pooled Plasma	Roche HIV-1 Viral Load	4 weeks		HIV Sero-Molecular Laboratory 011 386 6330 011 386 6437
HIV	Plasma in EDTA or ACD tube	Frozen 1ml Plasma (-20ºC) or Whole blood to be separated within 24 hours of collection	HIV-1 RNA PCR	Roche HIV-1 Viral Load	5 Working days		HIV Sero-Molecular Laboratory 011 386 6330 011 386 6437
HIV	Whole blood (EDTA or ACD Tube)	4°C to room temperature Minimum 2ml whole blood DO NOT FREEZE	HIV DNA PCR	HIV-1 DNA PCR (Whole blood)	5 working days		HIV Sero-Molecular Laboratory 011 386 6330 011 386 6437
HIV	Dried Blood Spots collected on 903 Specimen Whatman collection paper	Sealed in plastic bags with desiccant and indicator to prevent moisture Minimum of three (3) full spots per card must be sent	HIV DBS viral load	ABBOTT RealTime HIV-1 quantitative PCR on DBS	5 working days or Project dependent		HIV Sero-Molecular Laboratory 011 386 6330 011 386 6437
HIV	Frozen EDTA whole blood	Minimum of 2 X 100ul of frozen whole blood	HIV TNA PCR	HIV TNA PCR	5 working days		HIV Sero-Molecular Laboratory 011 386 6330 011 386 6437
HIV	Plasma collected on Plasma Separation Card (PSC)	Sealed in plastic bags with desiccant and indicator to prevent moisture Minimum of three (3) full spots per card must be sent	HIV-1 RNA PCR	Roche HIV-1 Viral load	5 working days		HIV Sero-Molecular Laboratory 011 386 6330 011 386 6437

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
HIV	Whole blood (EDTA or ACD Tube)	Whole blood at room temperature	CD4	CD4 (TCell lymphocyte subset)	24 – 48 hours	No cold chain transport, transport at ambient temperature	HIV Sero-Molecular Laboratory 011 386 6330 011 386 6437
HIV	5 ml/10ml Clotted Blood or EDTA Blood and Dried Blood Samples (DBS) collected on Whatman 903 Cards - minimum of 3 full circles of whole blood, preferably fill all 5 circles	Transport blood samples at 2°C-8°C Maintenance of cold chain is required from collection to receipt at NICD. DBS samples can be transported at RT°C (stable at RT°C for 14 days)	HIV ELISA	HIV-1/2 Antibody EIA	5 -7 working days or project dependent	Project/Survey requirements must be provided in writing by Requestor and discussed with NICD prior to testing.	HIV Sero-Molecular 011 386 6435 011 386 6437 011 386 6457
HIV	5 ml/10ml Clotted Blood or EDTA Blood and Dried Blood Samples (DBS) collected on Whatman 903 Cards – minimum of 3 full circles of whole blood, preferably fill all 5 circles	Transport blood samples at 2°C-8°C Maintenance of cold chain is required from collection to receipt at NICD DBS samples can be transported at RT°C (stable at RT°C for 14 days)	HIV ELISA	HIV-1/2 Antigen-Antibody EIA	5 -7 working days or project dependent	Project/Survey requirements must be provided in writing by Requestor and discussed with NICD prior to testing.	HIV Serol-Molecular 011 386 6435 011 386 6437 011 386 6457
HIV	5 ml/10ml Clotted Blood or EDTA Blood and Dried Blood Samples (DBS) collected on Whatman 903 Cards – minimum of 3 full circles of whole blood, preferably fill all 5 circles	Transport blood samples at 2°C-8°C Maintenance of cold chain is required from collection to receipt at NICD DBS samples can be transported at RT°C (stable at RT°C for 14 days)	HIV-1 or HIV-2 Western Blot	HIV-1 Western Blot HIV-2 Western Blot Geenius HIV ½ Confirmatory Rapid Assay (Serum, Plasma or Whole blood only)	5 -7 working days or project dependent	Project/Survey requirements must be provided in writing by Requestor and discussed with NICD prior to testing	HIV Serol-Molecular 011 386 6435 011 386 6437 011 386 6457

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
HIV	5 ml/10ml Clotted Blood or EDTA Blood and Dried Blood Samples (DBS) collected on Whatman 903 Cards – minimum of 3 full circles of whole blood, preferably fill all 5 circles	Transport blood samples at 2-8°C Maintenance of cold chain is required from collection to receipt at NICD DBS samples can be transported at Room Temperature for (stable for 14 days at RT°C after collection)	HIV Incidence testing	Sedia HIV-1 BED Incidence EIA (Serum/Plasma only)Sedia HIV-1 LAg Avidity Incidence EIA (Serum/Plasma)Maximum HIV-1 LAg Avidity Incidence EIA (Serum/Plasma/DBS)(Research Purposes Only)	14 - 21 working days for up to 1000 samples or project dependent	Project/Survey requirements must be provided in writing by Requestor and discussed with NICD prior to testing.	HIV Serol-Molecular 011 3866475 011 386 6437
HIV	Plasma in EDTA or ACD tube	Frozen 1ml Plasma (-20ºC) or Whole blood to be separated within 24 hours of collection	HIV Viral Load	Cobas 8800	5 working days		HIV Sero-Molecular Laboratory 011 386 6330 011 386 6437
HIV-1	p24	Store at -70˚C	HIV-2 Western Blot	Culture supernatants	2 months	All these tests are done for Research/Project purposes only.	Virology Research Laboratory Lab Manager L Nxumalo 011 386 6341
HIV-1	Neutralization assays a) Pseudovirion assay	Transported on dry ice		Serum /plasma, monoclonal antibodies	2 months or project dependent	All tests are done for Research / Project purposes	Virology Research Laboratory Lab Manager L Nxumalo 011 386 6341
HIV-1	Drug resistance testing a) In-House assay	Store at -70˚C		Plasma from EDTA blood	2 months	Can be used for diagnostic purposes in special circumstances.	Virology Research Laboratory Lab Manager L Nxumalo 011 386 6341
HIV-1	Gag ELISA	Store at -20˚C		Serum	2 months	All these tests are done for Research/Project purposes only.	Virology Research Laboratory Lab Manager L Nxumalo 011 386 6341

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
HIV-1	HIV Virus isolation	LN storage		PBMC's	2 months	Whole blood received for testing to be stored at ambient temperature only	Virology Research Laboratory Lab Manager L Nxumalo 011 386 6341
HIV-1	5ml/10ml Clotted blood or EDTA blood and Dried blood samples (DBS) collected on Whatman 903 Cards – minimum of 3 full circles of whole blood, preferably fill all 5 circles or frozen plasma	Transport blood samples at 2-8ºC DBS samples can be transported at room temperature (stable for 14 days at RTºC after collection) Transport can be on Dry Ice and stored at -70ºC	Drug resistance testing In-house assay	Plasma from EDTA blood DBS	2 Months or project dependant	Project/Survey requirements must be provided in writing by Requestor and discussed with NICD prior to testing	Virology Research Laboratory Lab Manager L Nxumalo 011 386 6341
HIV-1	Mycoalert Mycoplasma	Store at -20˚C		Cell supernatants	1 month		Virology Research Laboratory Lab Manager L Nxumalo 011 386 6341
Treponema pallidum	Clotted blood or EDTA Serum Plasma	Transport on ice		RPR	Project dependant	Only available for Surveillance purposes and research projects	STI 011 555 0461 011 555 0468
Treponema pallidum	Clotted blood or EDTA Serum Plasma	Transport on ice		TPPA	Project dependant	Only available for Surveillance purposes and research projects	STI 011 555 0461 011 555 0468
Treponema pallidum	Clotted blood or EDTA Serum Plasma	Transport on ice		TPAb	Project dependant	Only available for Surveillance purposes and research projects	STI 011 555 0461 011 555 0468
Treponema pallidum	Ulcer swab (Dacron)	Transport on ice or frozen	Syphilis/ *Treponema pallidum* PCR	PCR	10 days	Only available for Surveillance purposes and research projects and special cases (see above)	STI 011 555 0461 011 555 0468

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Treponema pallidum	Ulcer swab (Dacron)	Transport on ice or frozen		Molecular Typing	Project dependant	Only available for Surveillance purposes and research projects	STI 011 555 0461 011 555 0468
Treponema pallidum	Ulcer swab (Dacron)	Transport on ice or frozen		Macrolide resistance testing by PCR/ Sequencing	Project dependant	Only available for Surveillance purposes and research projects	STI 011 555 0461 011 555 0468
Lympho granuloma Venereum (LGV)	Ulcer swab Genital swab (Dacron)	Transport on ice or frozen		PCR	10 days	Only available for Surveillance purposes and research projects And special cases (see above)	STI 011 555 0461 011 555 0468
Chlamydia trachomatis	Urine Urethral Swab Vaginal swab Endocervical swab Oropharyngeal swab Rectal swab (Dacron swabs)	Transport on ice or frozen		NAAT (PCR, TMA)	10 days	Only available for Surveillance purposes and research project and special cases (see above)	STI 011 555 0461 011 555 0468
Haemophilus. ducreyi	Ulcer swab (Dacron swabs)	Transport on ice or frozen		PCR	10 days	Only available for Surveillance purposes and research project And special cases (see above)	STI 011 555 0461 011 555 0468
Mycoplasma genitalium	Urine Urethral swab Vaginal swab Endocervical swab (Dacron swabs)	Transport on ice or frozen		PCR	10 days	Only available for Surveillance purposes and research project And special cases (see above)	STI 011 555 0461 011 555 0468
Neisseria gonorrhoeae	Urethral swab Vaginal swab Other samples as indicated by clinical presentation Endocervical swab Rectal swab Pharyngeal swab Cultured strains (Dacron or nylon flocked swabs)	Use special transport media (Amies Stuarts). Transport at 4°C to reach lab within 48 hours.		Culture and Antimicrobial susceptibility testing	7 days	Only available for Surveillance purposes and research project And special cases (see above)	STI 011 555 0461 011 555 0468

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Neisseria gonorrhoeae	Urine Urethral swab Vaginal swab Other samples as indicated by clinical presentation Endocervical swab Penile swab Rectal swab Pharyngeal swab (Dacron or nylon flocked swabs)	Transport on ice or frozen		NAAT (PCR, TMA)	10 days	Only available for Surveillance purposes and research project And special cases (see above)	STI 011 555 0461 011 555 0468
Neisseria gonorrhoeae	Urethral swab Vaginal swab Other samples as indicated by clinical presentation Endocervical swab Rectal swab Pharyngeal swab (Dacron or nylon flocked swabs) Cultured strains	Transport on ice or frozen Except for cultured strains at ambient temperature		Typing by PCR / Sequencing	Project dependent	Only available for Surveillance purposes and research projects And special cases e.g. extensively-drug resistant ceftriaxone-resistant strains (see above)	STI 011 555 0461 011 555 0468
Neisseria gonorrhoeae	Urethral swab Vaginal swab Other samples as indicated by clinical presentation Endocervical swab Rectal swab Pharyngeal swab (Dacron or nylon flocked swabs) Cultured strains	Transport on ice or frozen Except for cultured strains at ambient temperature		Antimicrobial resistance testing by PCR	Project dependent	Only available for Surveillance purposes and research project. And special cases e.g. extensively-drug resistant strains (see above)	STI 011 555 0461 011 555 0468

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
SARS-CoV-2	(i) Pseudovirion assay (ii) Spike and RBD ELISA	Transport on dry ice Store at -70˚C or cooler. Transport on dry ice or at 2-8°C. Depends on the cohort. Plasma/serum received for testing to be stored at 2-8°C if for immediate testing or -70°C or cooler for long term storage		Serum Serum/Plasma	2 months 2 months	All these tests are done for Research/Project purposes only.	Virology Research Laboratory Lab Manager L Nxumalo 011 386 6341
Trichomonas vaginalis	Urine Urethral swab Vaginal swab Endocervical swab	Transport on ice or frozen		NAAT (PCR,TMA)	10 days	Only available for Surveillance purposes and research project And special cases	STI 011 555 0461 011 555 0468

Centre for Emerging Zoonotic and Parasitic Diseases

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Arbovirus (Chikungunya, Dengue, West Nile, Rift Valley fever, Sindbis, Zika) ICD-10 code for unspecificied arthropod-borne viral fever, A94	Clotted blood or serum, minimum of 1.0 ml Highly recommended to submit repeat specimens, preferably acute and convalescent specimens	Tubes in sealed in leak-proof containers. Label clearly as biohazardous. Adhere to national and international regulations for transportation of hazardous biological goods as required. Address to Centre for Emerging Zoonotic and Parasitic Diseases, Arbovirus Reference Laboratory, cold transport on ice packs Contact Laboratory or NICD Hotline for consult on urgent cases	Arbovirus (Routine arbo screen, include serology for Chikungunya, West Nile, Sindbis, Rift Valley fever) Dengue and Zika for patient with travel history. Zika virus neutralization test PCR/Isolation for Acute cases only Disease specific IgM or IgG ELISA	Serology: (HAI is performed as initial screen; any positive results are followed up with IgM ELISA to confirm recent infection. Testing of acute and convalescent specimens to indicate seroconversion by four fold rise in IgG titre is highly recommended or IgM seroconversion) *Zika virus neutralization test is performed for confirmation of ELISA positive results.*	HAI: 5 working days HAI + IgM ELISA: 7 working days IgM ELISA: 2-4 working days Zika virus neutralization test: 21 working days	Rash or arthalgia syndromes with fever which may be linked to travel history, insect bites. Some cases develop encephalitis. Refer to Arbovirus Diagnostic Guide or Outbreak specific guidelines available from *www.nicd.ac.za* Highly recommended to submit repeat / paired specimens, preferably acute and convalescent specimens. Submit Case investigation form (available from NICD website)	Arbovirus Reference Laboratory Dr O Hellferscee 011 386 6424/6353 Dr J Weyer 082 903 9131 011 386 6376 NICD Hotline

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
	Alternative/additional specimens for PCR CSF *(for encephalitic cases only, requires at least 500 µl)* Liver biopsies *(for post mortem confirmation only, contact Laboratory)*	See above	Arbovirus PCR *(specify which arbovirus, for example "Dengue PCR")* Arbovirus isolation	RT-PCR Virus isolation	2 working days 18 working days	See above. Should be requested in addition to the Arbovirus routine serology screen for acute cases only. Only useful for specimens collected within 7 days of onset of illness or acutely ill patients. Submit Case investigation form (available from NICD website) *Note: Arbovirus isolation is no longer offered, until further notice.*	See above
Bacillus anthracis (anthrax)	<u>*Cutaneous*</u> <u>Vesicular stage:</u> Soak 2x sterile dry swabs in vesicular fluid from a previously unopened vesicle. <u>Eschar stage:</u> Rotate 2x sterile dry swabs for 2-3s beneath the edge of eschar without removing it. <u>Biopsy of lesion:</u> Fresh Tissue in PBS/saline *Please note:* Do not send preserved tissue	Transport at room temperature	Anthrax (ANTHR)	Microscopy, culture and special identification	5 days	Safety precautions should be taken when handling/collecting samples Samples should be taken **prior to antibiotic treatment** and should reach laboratory as quickly as possible <u>Important</u> Please notify laboratory prior to sending specimens	Special Bacterial Pathogens Reference Laboratory 011 555 0331 011 555 0306

	Inhalation Pleural fluid or sputum (>1 ml) collected in sterile container Blood culture plus 1 tube clotted blood and 1 tube whole blood (EDTA tube)	Transport at 2-8°C Transport blood culture at room temperature and blood tubes at 2-8°C					

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
	Gastrointestinal Stool or rectal swab Blood culture plus 1 tube clotted blood and1 tube whole blood (EDTA tube)	Transport at 2-8°C Transport blood culture at room temperature and blood tubes at 2-8°C					
	Meningitis CSF in sterile container Blood culture plus 1 tube clotted blood and 1 tube whole blood (EDTA tube)	Transport at 2-8°C Transport blood culture at room temperature and blood tubes at 2-8°C					
Clostridium botulinum (botulism)	20 to 30 ml clotted blood or 10 to 15 ml serum 25 to 50 g of stool Gastric washing Vomitus Suspected food	Transport at 2-8°C	Botulinum	Mouse neutralization assay, Anaerobic culture and confirmation	4 weeks	Important Please notify laboratory prior to sending specimens. Samples should be taken as soon as possible after onset of illness.	Special Bacterial Pathogens Reference Laboratory 011 555 0331 011 555 0306
Monkeypox ICD-10 code is B04	Skin lesion material: Swabs of lesion exudate / aspirate of lesion fluid, lesion fluid, lesion of roof/s, lesion crust/s collected in Dacron or polyester flocked swabs with VTM or dry swab.	Specimen containers must be sealed Leak-proof containers Adhere to national and international transportation of biological goods. (Category A) Address to Centre for Emerging Zoonotic and Parasitic Diseases, Special Viral Pathogens Laboratory, cold transport on ice packs	Monkeypox	Monkeypox PCR	2 Working days	Fever, headache, muscle aches, backache, chills, exhaustion, lymphadenopathy, lesions. Travel history to central and western Africa or other exposure events (i.e. contact with exotic pets)	Special Viral Pathogens Laboratory Dr J Weyer 011 386 6376 082 903 9131 NICD Hotline

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Requirements (Temperature Stability, Minimum time to	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Rabies	Clotted blood or serum, minimum of 0.5 ml	Specimen containers must be sealed in proof containers. Adhere to national and international transportation of biological goods. Address to Emerging Zoonotic and Parasitic Pathogens, cold transport on ice packs.	Rabies immunity	Serology: Rabies IgG	2 Working days	Only for post vaccinal immunity screening. Usually for high risk occupational groups such as veterinarians or animal handlers or laboratory workers in laboratories that handle rabies virus	Special Viral Pathogens Laboratory Dr J Weyer 011 386 6376 082 903 9131
Rabies (Rabies and rabies-related lyssaviruses) ICD-10 code is A82.9	Antemortem: Saliva, minimum of 0.5 ml CSF, minimum of 0.5 ml Nuchal biopsies, single biopsy collected with dermatological punch from nape of neck *Post mortem:* Brain. Brainstem is most specimen. Whole, half or representative regions of brain submitted in 50 % glycerol in plastic screw top Brain biopsies collected via supraorbital fissure (contact laboratory for instructions). **Do not submit in formalin**. If saline available freeze fresh.	Specimen containers be sealed in leak-containers. Adhere to national international transportation of biological goods as Address to Centre for Emerging Zoonotic Parasitic Diseases, Arbovirus, cold ice packs Contact Laboratory Hotline for consult on cases	Rabies	*Antemortem:* RT-PCR (performed on saliva, CSF and biopsy) Serology (Rabies IgG/IgM) (performed on CSF and blood/serum) *Post mortem:* Rabies fluorescent antibody test (DFA or FAT)	2 Working days 2 Working days 2 Working days	For antemortem investigation of suspected rabies cases. Encephalitis with rapid progression, hydrophobia, dementia, hallucinations, lucid periods usually present. Suggested that all specimens should be co-submitted to rule out rabies. It is highly recommended to submit at least 3 consecutively collected saliva samples (collected at least 3-6 hours apart). Serology is of limited value to investigate clinical cases, but may be performed as part of battery of laboratory investigations. Post- mortem investigation is most conclusive. Contact Laboratory/NICD Hotline for advice	Special Viral Pathogens Laboratory Dr J Weyer 011 386 6376 082 903 9131 NICD Hotline

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Severe fever with thrombocytopenia syndrome (SFTS)	Clotted blood or serum, minimum of 0.5 ml	Specimen containers must be sealed leak-proof containers. Adhere to national and international transportation of biological goods. Address to Centre for Emerging Zoonotic and Parasitic Diseases, Special Viral Pathogens, cold transport on ice packs Contact Laboratory or NICD Hotline	SFTS	SFTS PCR	2 Working days	High fever, thrombocytopenia, leukocytopenia and gastrointestinal disorders. Travel history to endemic areas or other exposure events	Special Viral Pathogens Laboratory Dr J Weyer 011 386 6376 082 903 9131 NICD Hotline
Leptospira spp. (Leptospirosis)	1 Tube of clotted blood or serum *Please note:* Tests not done on urine, plasma, haemolysed, icteric or lipeamic blood.	Transport at 2-8°C Sample should reach laboratory within 3 days.	Leptospirosis (LEPTO)	Serology: IgM ELISA	4 days		Special Bacterial Pathogens Reference Laboratory 011 555 0331 011 555 0306
Viral haemorrhagic fevers (Crimean-Congo haemorrhagic fever, Ebola, Marburg, Lassa, Hanta and Yellow fever) ICD-10 code for unspecified viral haemorrhagic fever, A99	Clotted blood or serum, minimum of 1.0 ml	Tubes in sealed in leak-proof containers. Label clearly as biohazardous and suspected VHF. Adhere to national and international regulations for transportation of hazardous biological goods (Category A) as required Address to Center for Emerging Zoonotic and Parasitic Diseases, Special pathogens, cold transport on ice packs Contact Laboratory and/or NICD Hotline	VHF	Serology (Fluorescent antibody test: IgG and IgM ELISA: IgG and IgM) PCR Virus Isolation	2 Working days 2 Working days 21 working days	Fever, Rash Headache, Arthralgia, Myalgia, Haemorrhagic manifestations, Gastrointestinal symptoms, Pathology indicators, Travel history or other exposure events Contact Laboratory and/or NICD Hotline Submission of repeat specimen critical to confirm or exclude VHF Full battery of tests (serology, PCR and isolation) recommended for most conclusive testing)	Special Viral Pathogens Laboratory Dr J Weyer 011 386 6376 082 903 9131 Contact NICD Hotline

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Virus screening (infections of unknown aetiology	Cultured isolates, any fluid specimen (minimum 0.1 ml) in sterile container or dried between 2 microscope slides and sealed (lesion fluid, aspirate, serum, CSF, tears), scabs, crusts, biopsy/autopsy tissues (in saline and not larger than 10^3mm), clarified stool samples	Specimen containers must be sealed in plastic bags. Adhere to national and international transportation of biological goods. Address to Centre for Emerging Zoonotic and Parasitic Diseases, Electron Microscopy Laboratory Transport at 2-8°C or room temperature	Viral screening	Transmission electron microscopy and negative staining	3 Working days	Please contact laboratory for specimen-specific requirements. Notify the laboratory when specimens are dispatched	Electron Microscope Laboratory 011 386 6318

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Yersinia pestis (Plague)	<u>*Bubonic*</u> Bubo aspirate in PBS in sterile container <u>plus</u> 2x swabs (absorb a few drops of sample on a sterile swab and place into Cary Blair transport medium)	Transport at 2-8°C or room temperature.	Plague (PLAGE)	Microscopy (Gram, Wayson & DFA), culture and confirmation	5 days	Safety precautions should be taken when handling/collecting samples Samples should be taken **prior to antibiotic treatment** and should reach laboratory as quickly as possible <u>Important</u> Please notify laboratory prior to sending specimens	Special Bacterial Pathogens Reference Laboratory 011 555 0331 011 555 0306
	<u>*Pneumonic*</u> Sputum in sterile container <u>plus</u> 2x swabs (rotate swab in sputum sample and place into Cary Blair transport medium)	Transport at 2-8°C or room temperature.					
	<u>*Septicemic*</u> Blood culture bottle	Transport at room temperature					
	1 tube clotted blood or serum *Please note:* Paired serum taken 2-3 weeks apart is required for confirmation	Transport at 2-8°C	Plague serology (PLAGE)	Serology: ELISA	2 days		
	<u>Surveillance</u> Clotted animal blood e.g. rodent, dog	Transport at 2-8°C	Plague surveillance (RATS)	Serology	4 weeks		
Parasitology							
<u>Parasite -*Borrelia duttoni*</u> or *B. recurrentis* (Relapsing fever)	Unclotted, EDTA blood or blood films. *Clotted blood is unsuitable.*	Transport at ambient temperature or on ice.	Relapsing fever borrelia	Staining and microscopy	1 day		Parasitology Reference Laboratory 011 555-0304 011 555-0311
<u>Parasite -*Babesia*</u> species (Babesiosis)	Unclotted, EDTA blood or blood films. *Clotted blood is unsuitable.*	Transport at ambient temperature or on ice.	Babesia	Staining and microscopy	1 day		Parasitology Reference Laboratory 011 555-0304 011 555-0311

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Parasite -*Plasmodium* species (Malaria)	Unclotted, EDTA blood or blood films. *Clotted blood is unsuitable.*	Transport at ambient temperature or on ice.	Malaria investigation	Staining and microscopy	1 day		Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -*Plasmodium* species (Malaria) - *P. falciparum* - *P. malariae* - *P. ovale* - *P. vivax* - *P. knowlesi*	Unclotted, EDTA blood. Blood spots blood films & RDTs may be used in exceptional circumstances. *Clotted blood is unsuitable.*	Transport at ambient temperature or on ice. Blood should be transported to the laboratory as quickly as possible.	Malaria PCR	Malaria PCR	2 days	Only request PCR test when: ■ the malaria microscopy and RDT (rapid diagnostic test) results do not correlate ■ the malaria microscopy and/or RDT results are negative and malaria is still suspected ■ malaria species confirmation is needed ■ the patient has already been treated for malaria but routine tests are either not done or negative	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -*Plasmodium falciparum* (Malaria)	Unclotted, EDTA blood. *Clotted blood is unsuitable.*	Transport at ambient temperature or on ice.	Antigen test for malaria	Antigen test for *Plasmodium falciparum;* Combo antigen test for *Plasmodium* species (*P. falciparum, P. malariae, P. ovale, P. vivax*)	1 day		Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Microfilaria species (*W. bancrofti, L. loa, M. perstans* etc)	Unclotted, EDTA blood or blood films. Blood sampling should be performed at the correct times depending on the suspected filarial species*	Transport at ambient temperature or on ice.	Microfilaria investigation	Staining and microscopy	1 day	*For *W. bancrofti* collect sample after 8pm, for *L. loa* at ~12pm and others at any time.	Parasitology Reference Laboratory 011 555-0304 011 555-0311

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Parasite -*Trypanosoma* species (Sleeping sickness or trypanosomiasis)	Unclotted, EDTA blood, blood films or fresh CSF (1ml). *Clotted blood is unsuitable.*	Transport at ambient temperature or on ice. Ideally CSF specimens must reach laboratory within 30 minutes of sampling.	Trypanosome investigation	Staining and microscopy	1 day		Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Human protozoa including: *Cryptosporidium species, Cystoisosporal belli, Cyclospora cayetanensis, Giardia lamblia, Entamoeba coli, Blastocystis hominis*	Stool or duodenal aspirate/string test. Specimens, that may take longer than a day to reach the laboratory, should ideally be preserved in an equal quantity of 10% formalin.	Transport at ambient temperature or on ice.	Stool parasites (specify suspected parasite, if applicable)	Microscopic identification of all human protozoa	1 day		Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite – Microsporidia (unicellular intracellular parasites closely related to fungi) including *Enterocytozoon bieneusi*, *Encephalitozoon* species	Stool, urine, duodenal aspirates, CSF, eye or appropriate tissue samples.	Transport at ambient temperature or on ice. Tissue biopsies in saline.	Microsporidia investigation	PCR	2 days		Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite – *Toxoplasma gondii (protozoan)*	Whole blood, tissue, vitreous fluid, amniotic fluid, CSF.	Transport at ambient temperature or on ice. Tissue biopsies in saline	Toxoplasma PCR	Toxoplasma PCR	2 days		Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -*Entamoeba histolytica* (Amoebiasis)	Stool, liver abscess fluid or cyst fluid. Minimum volume is 1ml.	Transport at ambient temperature or on ice. Don't add preservative. Ideally specimen must reach laboratory within 30 minutes of sampling.	Amoebiasis	Microscopy	1 day		Parasitology Reference Laboratory 011 555-0304 011 555-0311

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Parasite -Human nematodes including: *Ascaris lumbricoides* (common roundworm), hookworms (*Ancylostoma duodenale/ Necator americanus*), *Trichuris trichiura* (whipworm), *Strongyloides stercoralis*	Stool or worm/s. Specimens that may take longer than a day to reach the laboratory should ideally be preserved in an equal quantity of 10% formalin.	Transport at ambient temperature or on ice.	Stool parasites (specify suspected parasite, if applicable)	Macroscopic and/or microscopic identification.	1 day		Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -*Enterobius vermicularis* (pinworm)	Early morning sticky tape swab is the optimal specimen.	Transport at ambient temperature or on ice.	*Enterobius vermicularis/* (pinworm)	Microscopy	1 day	Eggs may be infective – handle with care.	Parasitology Reference Laboratory 011 555-0304 011 555-0311

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Parasite -*Strongyloides stercoralis*	Sputum, urine or CSF. Minimum volume is 1ml. Larvae may be infective – handle with care.	Transport at ambient temperature or on ice.	*Strongyloides stercoralis*	Microscopy and/or culture for larvae of *Strongyloides stercoralis.*	1 day	For disseminated infections.	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Human trematodes including: *Schistosoma mansoni/ haematobium* (Bilharzia, schistosomiasis)	Stool. Specimens, that may take longer than a day to reach the laboratory, should ideally be preserved in an equal quantity of 10% formalin.	Transport at ambient temperature or on ice.	Stool parasites (specify suspected parasite, if applicable)	Microscopic identification of all human trematodes.	1 day		Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -*Schistosoma haematobium* (Schistosomiasis, bilharzia)	Urine, minimum volume is 5ml.	Transport at ambient temperature or on ice.	*Schistosoma haematobium*	Microscopy	1 day		Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Human cestodes (tapeworms) including: *Taenia saginata, T. solium, H. nana, H. diminuta* and *D. latum*	Stool. Specimens, that may take longer than a day to reach the laboratory, should ideally be preserved in an equal quantity of 10% formalin.	Transport at ambient temperature or on ice.	Stool parasites (specify suspected parasite, if applicable)	Microscopic identification of all human cestodes/ tapeworms.	1 day		Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -Tapeworm (adult) identification	Worm or proglottid (tapeworm segment). Submit proglottids in saline.	Transport at ambient temperature or on ice.	Tapeworm identification	Macroscopic and/or microscopic identification.	1-2 days	Proglottids may be infective – handle with care.	Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -*Echinococcus* species (Echinococcosis, hydatid disease)	Cyst tissue, cyst fluid or sputum, minimum volume is 1ml.	Transport at ambient temperature or on ice, if transport is expected to take longer than 2 days it is best to transport at 4°C.	Echinococcus	Microscopic examination for hydatid hooklets and scolices of *Echinococcus* species.	1 day	May be infective – handle with care.	Parasitology Reference Laboratory 011 555-0304 011 555-0311

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Parasite - *Acanthamoeba* spp. (*Acanthamoeba* Keratitis granulomatous amoebic encephalitis, nasopharyngeal, cutaneous or disseminated infection)	Corneal scrapings or biopsy, or contact lenses, cases and solutions. Send tissue in saline. Brain, skin, nasal or sinus biopsies. Send tissue in saline.	Transport at ambient temperature or on ice.	Acanthamoeba	Culture, Staining PCR	2 weeks (Prov. result sent day 2) 2 days		Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -*Leishmania* species (Leishmaniasis)	Bone marrow, liver biopsy, skin biopsy/impression smears. Submit skin biopsy in saline.	Transport at ambient temperature or on ice.	Leishmania investigation	Staining and microscopy	1 day		Parasitology Reference Laboratory 011 555-0304 011 555-0311
Parasite -*Pneumocystis jirovecii* (*Pneumocystis* pneumonia, PCP)	Respiratory specimens including: induced sputum, tracheal aspirates, bronchial washings, bronchoalveolar lavage (BAL) or gastric wash. Random sputum is not an optimal specimen. Minimum volume is 1ml.	Transport at ambient temperature or on ice.	*Pneumocystis jirovecii* PCR	PCR	2 days	Please send a respiratory specimen (induced or expectorated sputum, BAL etc.) for this test when PCP is suspected clinically/ radiologically, but the routine lab test (IFA) is negative.	Parasitology Reference Laboratory 011 555-0304 011 555-0311

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Vector Control Reference Laboratory							
Arthropods/ Insects	Adult mosquitos must be undamaged and preserved on silica. A piece of paper must separate the specimen from the silica crystals. There must be only 1 mosquito per silica tube. Mosquito larvae should preferentially be reared to adults and preserved on silica tubes as described above. Identifying larvae by PCR is not recommended; However, if rearing of the larvae is not possible, larvae must be preserved in 70% ethanol with 1 larva per tube.	Transport at ambient temperature. Estimated time of arrival: 1 week	Morphological identification, PCR identification and/or ELISA where indicated	Morphological identification; PCR identification: *An. gambiae* and *An. funestus* identification, MS PCR and *kdr* PCR and/or ELISA	1 Month for PCR identification from the time the samples were received at VCRL. 6 weeks for morphologica l identification as well as PCR identification Please note: TAT does not apply for project specimens Samples for ELISA testing are done in a batch, unless ELISA testing of samples is urgent.	Please send undamaged samples and all information relating to each sample must be in document form. Samples must be clearly labelled on the individual tube caps. The labels must match the information sheet. Sample numbers should be listed in consecutive order on the information sheet. Two samples must not have the same number. GPS coordinates for all locations should be provided.	Vector Control Reference Laboratory 011 386 6480

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
ANTIMALARIAL RESISTANCE MONITORING AND MALARIA OPERATIONAL RESEARCH (ARMMOR)							
Parasite -*Plasmodium* falciparum (Malaria)	Unclotted, EDTA blood, Dried blood spots, blood films & used malaria RDTs	EDTA Blood should be transported on ice to the laboratory as quickly as possible. Dried blood spots, blood films and used malaria RDTs can be transported at ambient Temperature.	Antimalarial drug or diagnostic resistance marking	Antimalarial drug or diagnostic resistance PCR	7 to 10 working days for antimalarial drug resistance analysis 3 working days for the antimalarial diagnostic resistance analysis	Only request PCR for antimalarial resistance marking if the patient has failed treatment. Ideally samples from initially infection and relapsed infection should be sent to the laboratory for testing Only request PCR for antimalarial diagnostic resistance testing if a patient with high parasitemia is malaria positive by microscopy but negative by malaria RDT	ARMMOR 011 386 6374

Centre for Enteric Diseases

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
***Campylobacter* spp**	Laboratory-confirmed isolates from all body site	Inoculated Dorset slopes / Transwab incubated at 42˚C overnight at source laboratory, prior to submission to CED- Bacteriology Dorset slope / Transwab to be transported at ambient temperatures to the NICD	Enteric surveillance and reference function	**Phenotypic:** Biochemical identification **Genotypic:** Real time PCR for detection of *Campylobacter* jejuni and *Campylobacter* coli	Project dependent and GERMS-SA Quarterly stats timelines	Submit a copy of the patient's laboratory report OR a case report form obtainable from CED-Bacteriology Provide email address or telephone number for urgent requests Surveillance isolates are tested in batches	CED Bacteriology 011 386 6235 011 555 0348 011 555 0334 011 555 0426

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Diarrhoeagenic *Escherichia coli* Watery or bloody diarrhoea, abdominal cramps, with or without fever	Laboratory-confirmed isolates from stool or rectal swab only. Laboratory confirmed isolate from all body sites for suspect EHEC/*E. coli* O157. Laboratory-confirmed isolates from environmental or food samples	Inoculated Dorset slopes incubated at 37˚C overnight at source laboratory, prior to submission to CED- Bacteriology. Dorset slope to be transported at room temperatures to the NICD.	**Diarrhoeagenic *Escherichia coli*** characterization	**Phenotypic:** Biochemical identification	3 working days	Submit a copy of the patient's laboratory report OR a case report form obtainable from CED-Bacteriology Provide email address or telephone number for urgent requests	CED Bacteriology 011 386 6235 011 555 0348 011 555 0334 011 555 0360/0426
				Serotyping O-antigen	7 working days		
				Genotypic: Virulence gene detection by multiplex-PCR.	5 working days		
			Enteric surveillance and reference function	Phenotypic characterization and whole- genome sequence (WGS) analysis	Project dependent and GERMS-SA Quarterly stats timelines	Surveillance isolates are tested in batches Surveillance isolates are tested in batches	

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
***Vibrio cholerae* O1** and **non-O1** (non-cholera *Vibrio* species) Acute watery diarrhoea	Laboratory-confirmed cultured isolate from all body sites. Laboratory-confirmed isolates from environmental or food samples	Inoculated Dorset slopes incubated at 37˚C overnight at source laboratory, prior to submission to CED- Bacteriology. Dorset slope to be transported at ambient temperatures to the NICD	***Vibrio* species** characterization and antimicrobial susceptibility testing	**Phenotypic:** Biochemical identification/ Serotyping	3 working days	Submit a copy of the patient's laboratory report OR a case report form obtainable from CED-Bacteriology Provide email address or telephone number	CED Bacteriology 011 386 6235 011 555 0348 011 555 0334 011 555 0360/0426
				Antimicrobial susceptibility testing	4 working days		
				Genotypic: Cholera enterotoxin detection by real-time PCR	3 working days		
			Enteric surveillance and reference function	Phenotypic characterization and whole- genome sequence (WGS) analysis	Project dependent and GERMS-SA Quarterly stats timelines		

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Salmonella Typhi and non-typhoidal *Salmonella* species	Laboratory-confirmed isolates from all body site Laboratory-confirmed isolates from environmental or food samples	Inoculated Dorset slopes incubated at 37˚C overnight at source laboratory, prior to submission to CED- Bacteriology Dorset slope to be transported at ambient temperatures to the NICD	*Salmonella* species characterization	Phenotypic Biochemical identification/ *Salmonella* serotyping	12 Working days	Submit a copy of the patient's laboratory report OR a case report form obtainable from CED-Bacteriology Provide email address or telephone number for urgent requests Surveillance isolates are tested in batches	CED Bacteriology 011 386 6235 011 555 0348 011 555 0334 011 555 0426
				Antimicrobial susceptibility testing	4 Working days		
			Enteric surveillance and reference function	Phenotypic characterization and whole- genome sequence (WGS) analysis	Project dependent and GERMS-SA Quarterly stats timelines		
Shigella species	Laboratory-confirmed isolates from all body site Laboratory-confirmed isolates from environmental or food samples	Inoculated Dorset slopes incubated at 37˚C overnight at source laboratory, prior to submission to CED- Bacteriology Dorset slope to be transported at ambient temperatures to the NICD	*Shigella* species characterization	**Phenotypic:** Biochemical identification/ *Shigella* serotyping	5 working days	Submit a copy of the patient's laboratory report OR a case report form obtainable from CED-Bacteriology Provide email address or telephone number for urgent requests Surveillance isolates are tested in batches	CED Bacteriology 011 386 6235 011 555 0348 011 555 0334 011 555 0426
				Antimicrobial susceptibility testing	4 working days		
			Enteric surveillance and reference function	Phenotypic characterization and whole- genome sequence (WGS) analysis	Project dependent and GERMS-SA Quarterly stats timelines		

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Listeria monocytogenes	Laboratory-confirmed isolates from all body site Laboratory-confirmed isolates from environmental or food samples	Inoculated Dorset slopes incubated at 37˚C overnight at source laboratory, prior to submission to CED- Bacteriology Dorset slope to be transported at ambient temperatures to the NICD	*Listeria species* characterization	**Phenotypic:** Biochemical identification	3 working days	Submit a copy of the patient's laboratory report OR a case report form obtainable from CED-Bacteriology Provide email address or telephone number for urgent requests Surveillance isolates are tested in batches	CED Bacteriology 011 386 6235 011 555 0348 011 555 0334 011 555 0426
			Enteric surveillance and reference function	**Genotypic:** Whole-genome sequence (WGS) analysis	Project dependent and GERMS-SA Quarterly stats timelines		
Listeria monocytogenes	CSF, blood or DNA from tissue samples (e.g placenta)	Maintenance of cold chain from collection to receipt at NICD. Store and transport at 4°C	*Listeria monocytogenes* detection	Real-time PCR	3 working days	Submit a copy of the patient's laboratory report OR a case report form obtainable from CED-Bacteriology Provide email address or telephone number	CED Bacteriology 011 386 6235 011 555 0348 011 555 0334 011 555 0426
Adenovirus Gastroenteritis: Diarrhoea, vomiting, fever	**Specimen:** Stool **Unsuitable Specimen**: Rectal swab in VTM	Maintenance of cold chain from collection to receipt at NICD. Store and transport at 4°C.	Enteric Adenovirus detection	Real-time PCR (Enteric adenovirus)	5 days	Specimen containers closed tightly and sealed in plastic bag accompanied with date of specimen collection and date of birth	CED Virology 011 555 0370

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Astrovirus Gastroenteritis: Diarrhoea, vomiting, fever	**Specimen:** Stool **Unsuitable Specimen**: Rectal swab in VTM	Maintenance of cold chain from collection to receipt at NICD. Store and transport at 4°C.	Astrovirus detection	Real-time PCR	5 days	Specimen containers closed tightly and sealed in plastic bag accompanied with date of specimen collection and date of birth	CED Virology 011 555 0370
Sapovirus Gastroenteritis: Diarrhoea, vomiting, fever	**Specimen:** Stool **Unsuitable Specimen**: Rectal swab in VTM	Maintenance of cold chain from collection to receipt at NICD. Store and transport at 4°C.	Sapovirus detection	Real-time PCR	5 days	Specimen containers closed tightly and sealed in plastic bag accompanied with date of specimen collection and date of birth	CED Virology 011 555 0370
Norovirus Gastroenteritis: Diarrhoea, vomiting, fever	**Specimen:** Stool **Unsuitable Specimen**: Rectal swab in VTM	Maintenance of cold chain from collection to receipt at NICD. Store and transport at 4°C.	Norovirus detection	Real-time PCR	5 days	Specimen containers closed tightly and sealed in plastic bag accompanied with date of specimen collection and date of birth	CED Virology 011 555 0370
Rotavirus Gastroenteritis: Diarrhoea, vomiting, fever	**Specimen:** Stool **Unsuitable Specimen**: Rectal swab in VTM	Maintenance of cold chain from collection to receipt at NICD. Store and transport at 4°C.	Rotavirus detection	ELISA Real-time PCR	5 days	Specimen containers closed tightly and sealed in plastic bag accompanied with date of specimen collection and date of birth as well as vaccination history (where possible)	CED Virology 011 555 0370
			Rotavirus genotyping	RT-PCR genotyping			

Centre for Healthcare-Associated Infections, Antimicrobial Resistance and Mycoses

The Centre for Healthcare-Associated Infections, Antimicrobial Resistance and Mycoses (CHARM) aims to prevent and control opportunistic, healthcare-associated infections, to combat AMR (including antifungal and antibacterial resistance) and to provide expertise in mycology in South Africa

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Mycology Reference Laboratory							
Fungal pathogen from clinical sources which cannot be identified by academic/ referral laboratories	Unidentified fungal pathogen from clinical source should be inoculated into an agar slope/plate (screwtop) bottle such as Dorset transport medium or potato dextrose medium	Room temperature; inform Mycology Reference Laboratory if suspected dimorphic fungus which needs to be processed in in the CHARM Thermally dimorphic	Identification of fungal pathogen; antifungal susceptibility testing	Phenotypic and genotypic identification (where required) of unidentified fungal pathogens from clinical sources; Antifungal susceptibility testing	10 days (unless very slow-growing Organism or unusual [difficult to identify]	Complete case report form (can be obtained from the Mycology Reference Laboratory)	CHARM Mycology Reference Laboratory 011 555 0323 011 555 0325 011 555 0353
Moulds and dimorphic fungi from normally-sterile sites (surveillance)	Inoculated into an agar Slope/plate (screwtop) bottle such as Dorset transport medium or potato dextrose medium	Room temperature; inform Mycology Reference Laboratory if suspected dimorphic fungus which needs to be processed in a the CHARM Thermally dimorphic Lab	Identification of fungal pathogen; antifungal susceptibility testing; genotyping	Phenotypic and genotypic identification (where required) of unidentified fungal pathogens from clinical sources; Antifungal susceptibility testing	10 days (unless very slow-growing organism or unusual [difficult to identify]	Laboratory report	CHARM Mycology Reference Laboratory 011 555 0323 011 555 0325 011 555 0353
Cryptococcosis (surveillance)	Cryptococcal isolate should be inoculated into an agar slope/plate (screwtop) bottle such as Dorset transport medium	Room temperature	Cryptoccocal surveillance	Identification by phenotypic and genotypic methods; antifungal susceptibility testing	N/A	Complete GERMS case report or attach final lab report; Submission requested from GERMS-SA enhanced surveillance sites; private labs and NHLS labs in KZN	CHARM Mycology Reference Laboratory 011 555 0325 011 555 0381 011 555 0323

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Cryptococcal meningitis or antigenaemia or other disseminated syndrome	Whole blood ,plasma, serum and CSF	Transport at ambient temperature or on ice	Detection of cryptococcal antigen (CrAg)	CrAg iateral flow assay (LFA) CrAg enzyme immunoassay (EIA)	72hrs- 1 week	Laboratory Report and worksheet	CHARM Mycology Reference Laboratory 011 555 0381 011 555 0323 011 555 0325
Candidaemia (surveillance)	Candida isolate should be inoculated into an agar slope/plate (screwtop) bottle such as Dorset transport medium	Room temperature	Candida surveillance	Identification by phenotypic and genotypic methods; antifungal susceptibility testing	N/A	Complete GERMS case report or attach final lab report; Submission requested from participating GERMS-SA labs	CHARM Mycology Reference Laboratory 011 555 0325 011 555 0381 011 555 0323
Histoplasmosis	Urine	Transport in cooler box with ice packs	Detection of Histoplasma galactomannan antigen	Histoplasma enzyme immunoassay (EIA)	1 week	Clinical history and case investigation form	CHARM Mycology Reference Laboratory 011 555 0325 011 555 0381 011 555 0323
Any fungal pathogen (clinical cases where a mycosis is suspected and/or fungal elements observed but culture is negative)	Tissue (FFPE or fresh)	Transport in cooler box with ice packs	Detection of fungal DNA for sequence-based identification	Pan-fungal PCR with or without prolonged fungal culture (fungal culture only on fresh tissue)	1 week for PCR; 4 weeks for culture	Clinical history and case investigation form	CHARM Mycology Reference Laboratory 011 555 0325 011 555 0323 011 555 0491 011 555 0353

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Identification of fungal pathogen/s from an outbreak	Any relevant clinical specimen including colonisation swabs	Transport in cooler box with ice packs	Detection of fungal DNA for sequence-based identification or real-time PCR assay or fungal culture	Pan-fungal PCR, real-time PCR for Candida, fungal culture	48 hours to 1 week for molecular tests depending on urgency; fungal culture TAT depends on pathogen and rate of growth	Clinical history and case investigation form	CHARM Mycology Reference Laboratory 011 555 0325 011 555 0323 011 555 0491 011 555 0353

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
CHARM Antimicrobial Resistance Laboratory and Culture Collection(AMRL-CC)							
Staphylococcus aureus	Blood culture isolates, pus aspirate, sputum and other significant isolates sub-cultured on Dorset slopes	Transport at ambient temperature	AMR and virulence factor detection/confirmation	ID, MIC and molecular characterization of resistance mechanisms *mec*A and *mec*C; cfr-linezolid resistant gene, Virulence factor –*pvl* ; vancomycin AST	14 working days from receipt of culture	Referral isolate case Report forms FML1234 Refer to NICD using NIC1121	CHARM AMRL-CC 011 555 0342 CHARM molecular 011 386 6395
Multi-drug resistant organisms (MDROs) Enterobacterales and other organisms	Cultures on Dorset slopes or other suitable media to sustain viability during transport	Transport at ambient temperature	AMR –CPE; colistin and others detection/	ID, MIC and molecular characterization of resistance mechanisms		Highly resistant nosocomial infections	C CHARM AMRL-CC 011 555 0342 CHARM molecular 011 386 6395
Enterococcus faecium and *faecalis*	Cultures on Dorset slopes or other suitable media to sustain viability during transport	Transport at ambient temperature	AMR detection/confirmation	*Van* A,B and C genes	14 working days from receipt of culture	Referral isolate case Report forms FML1234 Refer to NICD using NIC1121	CHARM molecular 011 386 6395 CHARM AMRL-CC 011555 0342
MALDI-TOF identification	Cultures on Dorset slopes or other suitable media to sustain viability during transport	Transport at ambient temperature	Identification	Identification on MALDI-TOF	7 working days (organism dependent)	Submit isolates with final lab report and/or lab working card Clearly indicating MALDI TOF as the test request. Test requests written on agar plates will not be accepted	CHARM AMRL-CC 011555 0342

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Pan bacterial PCR (16s rRNA Sequencing or Sanger sequencing)	Cultures on Dorset slopes or other suitable media to sustain viability during transport or Tissue samples on saline/formalin fixed paraffin embedded tissue	Transport at ambient temperature	Bacterial Identification	PCR and Sequencing for Bacterial Identification	14 days from receipt of sample	Referral isolate case Report forms	CHARM AMRL-CC 011386 6395 CHARM AMRL-CC 011555 0342

Centre for Respiratory Diseases and Meningitis

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Respiratory illness: Adenovirus Influenza A virus • {H1N1pdm09 and • H3N2] • Influenza B virus • Parainfluenza virus types 1,2,3,4 [PIV] • Respiratory Syncytial virus [RSV] • Rhinovirus/enterovirus • Human • Metapneumovirus [hMPV] • Human Corona viruses (229E, OC43, NL63, HKU1) • SARS-CoV-2	Any respiratory sample (e.g. nasopharyngeal or tracheal aspirates, nasal, nasopharyngeal and/or oropharyngeal swabs, sputum, biopsies, autopsies etc.) Swabs should be placed in universal / viral transport medium (UTM/VTM) Nasopharyngeal- and oropharyngeal swabs should be combined in same UTM/VTM *Flocked swabs recommended, alternatively dacron or rayon swabs.	Transport in cooler box with ice packs. Sample should reach laboratory within 72hrs	Respiratory panel Pneumonia panel (PCR) – includes bacterial pathogens – please submit a lower respiratory tract specimen (sputum, BA) **Please note** that this will only be done as part of comprehensive diagnosis to investigate cause of severe respiratory illness or outbreaks of unknown cause	PCR **Note:** routine diagnostic testing available at NHLS or private pathology laboratories	24 hours from receipt of specimen	Specimens should be submitted with CRDM specimen submission form available on NICD website	CRDM Results; 011-386 6404 Queries; 011 555 6390 011 386 6373 Prof Anne von Gottberg 011 555 0316
Meningitis/Encephalitis Screen (viral/bacterial) *Escherichia coli* K1 *Haemophilus influenzae Listeria monocytogenes Neisseria meningitidis Streptococcus agalactiae Streptococcus pneumoniae* Cytomegalovirus (CMV) Enterovirus (EV) Herpes simplex virus 1 (HSV-1)	CSF (Cerebrospinal fluid)	Transport in cooler box with ice packs. Sample should reach laboratory as soon as possible	Meningitis screen	PCR	24 hours from receipt of specimen	Specimens should be submitted with CRDM specimen submission form available on NICD website	011 555 0315/7 (lab) 011 555 0387 (Dr Mignon du Plessis Laboratory Manager (Linda de Gouveia) 011 555 0327 Clinical queries – Prof

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Herpes simplex virus 2 (HSV-2) Human herpesvirus 6 (HHV-6) Human parechovirus (HPeV) Varicella zoster virus (VZV) Cryptococcus neoformans/gattii							Anne von Gottberg (011 555 0316)
SARS-CoV-2 COVID-19 (Coronavirus disease 2019)	Any respiratory sample e.g. Nasopharyngeal or tracheal aspirates Nasal, nasal mid-turbinate, nasopharyngeal and/or oropharyngeal swabs placed in UTM/VTM Sputum BAL Biopsies Other samples – discuss with Dr on call Swabs should be placed in universal / viral transport medium (UTM/VTM) Nasopharyngeal- and oropharyngeal swabs should be combined in same UTM/VTM Flocked swabs recommended. Alternatively, dacron or rayon swab	Transport in cooler box with ice packs. Sample should reach laboratory within 72hrs	SARS-CoV-2 COVID-19	Real-Time PCR **Note:** routine diagnostic testing available at NHLS or private pathology laboratories	2 working days	Specimens should be submitted with CRDM specimen submission form available on NICD website Contact line list should be completed for contact tracing COVID-19 is classified as a Category 1 notifiable medical condition (NMC).	**NICD Hotline 082 883 9920** CRDM Results: 011 386 6373/0356/6390 Queries: 011 555 6390/0356/0387/0352 Prof Anne von Gottberg 011 555 0316
Avian Influenza (H5, H7, H9)	Any respiratory sample (e.g. Nasopharyngeal or tracheal aspirates, nasal, nasopharyngeal and/or oropharyngeal swabs, sputum, biopsies, autopsies etc.) Swabs should be placed in universal / viral transport medium (UTM/VTM).	Transport in cooler box with ice packs. Sample should reach laboratory within 72hrs Transported as Infectious substance (packaging instruction 602 of IATA).	Avian influenza Contact NICD hotline on 082 883 9920 for all suspected avian influenza requests before submitting samples	Real-Time PCR	24 hours	Clinical features consistent with Avian Influenza infection PLUS meets epidemiological criteria as outlined in AI Case Investigation Document (Contact Epidemiologist)	**NICD Hotline 082 883 9920** CRDM 011 555 6390 011 555 0316 Prof Anne von Gottberg

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
	Nasopharyngeal- and oropharyngeal swabs can be combined in same UTM/VTM Flocked swabs recommended. Alternatively, dacron or rayon swabs					Specimens should be submitted with CRDM specimen submission form available on NICD website	
MERS-Coronavirus (MERS-CoV)	Induced sputum, lung aspirates, combined nasopharyngeal and oropharyngeal swabs or nasopharyngeal aspirates in UTM/VTM, BAL and biopsies of respiratory tract tissues. Other samples - discuss with Dr on call. Swabs should be placed in universal / viral transport medium (UTM/VTM). Nasopharyngeal and oropharyngeal swabs should be combined in same UTM/VTM Flocked swabs recommended. Alternatively, dacron or rayon swabs	Transport in cooler box with ice packs. Sample should reach laboratory within 72hrs **Transport as infectious substance (packaging instruction 602 of IATA Category A**).	MERS-CoV Contact NICD hotline on 082 883 9920 for all suspected MERS coronavirus test requests **Please note** that this test will only be done if case definition was met and discussed with NICD Dr on call (see NICD hotline number)	Real-Time PCR	24 hours	Clinical features consistent with Avian Influenza infection PLUS meets epidemiological criteria as outlined in AI Case Investigation Document (Contact Epidemiologist) Specimens should be submitted with CRDM specimen submission form available on NICD website	NICD Hotline 082 883 9920 CRDM 011 555 0316 (Prof Anne von Gottberg)
Severe respiratory illness of unknown cause	Any respiratory sample (e.g. Nasopharyngeal or tracheal aspirates, nasal, nasopharyngeal and/or oropharyngeal swabs, sputum, biopsies, autopsies etc.) Swabs should be placed in universal / viral transport medium	Transport in cooler box with ice packs. Sample should reach laboratory within 72hrs	Respiratory screen (bacterial and viral) Contact NICD hotline on 082 883 9920	Real-Time PCR	24 hours	Specimens should be submitted with CRDM specimen submission form available on NICD website	NICD Hotline 082 883 9920 CRDM 011 555 0316 (Prof Anne von Gottberg)

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
	(UTM/VTM). Nasopharyngeal- and oropharyngeal swabs should be combined in same UTM/VTM Flocked swabs recommended. Alternatively, dacron or rayon swabs						
Neisseria species, *Haemophilus* species and *Streptococcus* species (GERMS surveillance) Bacterial meningitis screen - diagnostic (*N. meningitidis, H. influenzae*, *S. pneumoniae* - routinely done), (Group B *Streptococcus*, E. coli*, S. aureus*, L. monocytogenes**) *on request	Isolates inoculated onto Dorset transport medium and incubated overnight at 37°C in 5% CO_2 Normally sterile site specimen (blood or cerebrospinal fluid [CSF] or other fluids e.g. pleural, peritoneal, synovial) Isolates inoculated onto Dorset transport medium and incubated overnight at 37°C in 5% CO_2 Clinical samples: minimum volume of 200µl, EDTA blood	Submit isolates on Dorset transport media after overnight incubation. Inoculate as per NIC0184. Do not refrigerate. Do not batch for longer than 1 week as isolates will lose viability. Clinical specimens at cool ambient temperature (e.g. in a cooler box)	Identification of *Neisseria* species, *Haemophilus* species or *Streptococcus* species for GERMS surveillance (GERMS- SA) Bacterial meningitis screen (PCR and culture)	PCR identification of *S..pneumoniae, N. meningitidis, H. influenzae* Group B *Streptococcus, E. coli*, *S. aureus*, *L. monocytogenes* Serotyping/ Serogrouping of S. pn, Nm, Hi (phenotypic and molecular) Antimicrobial susceptibility testing (disc and minimum inhibitory concentration - MIC)	PCR urgent 1-2 days Surveillance 1-2 months	Isolates submitted to NICD for national surveillance (GERMS- SA). Submit with sterile isolate form or LIS report. Specimens should be submitted with CRDM specimen submission form available on NICD website	NICD Hotline 082 883 9920 CRDM 011 555 0315 (micro) 011 555 0317 (micro) 011 555 0356 (molecular) 011 555 0387 (Dr Mignon du Plessis) 011 555 0352 (Dr Nicole Wolter)
Atypical pneumonia- causing pathogens (*Mycoplasma pneumoniae, Chlamydia pneumoniae, Legionella* spp., *Bordetella* spp.)	Sputum (expectorated or induced) in a sterile container, and/or nasopharyngeal-oropharyngeal aspirate or combined flocked swabs preferably in universal transport medium (UTM) or Primestore. For *Bordetella pertussis* culture, swabs should be placed in Regan Lowe (RL)	Sputum to be frozen immediately and transported on dry ice UTM and urine to be stored and transported refrigerated. Primestore – ambient temperature RL to be stored and transported at room	Atypical pneumonia PCR *Bordetella pertussis* Legionella spp.	PCR for identification of atypical pneumonia-causing bacteria (*M. pneumoniae, C. pneumoniae*, and *Legionella* spp) PCR for *B. pertussis* and other *Bordetella* spp. Culture for *Legionella*	PCR urgent 1 day/24 hours Non-urgent 2-4 days Culture 7-10 days	Specimens should be submitted with CRDM specimen submission form available on NICD website	CRDM 011 555 0315 011 555 0317 011 555 0352 (Dr Nicole Wolter) 011 555 0316 (Prof Anne von Gottberg)

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
	Urine (for *L. pneumophila* serogroup 1). Minimum volume 5ml in a sterile leak-proof container	temperature		spp., *B. pertussis and Bordetella spp.* Binax NOW for *Legionella pneumophila* (serogroup 1)			
Corynebacterium diphtheriae (Diphtheria)	Respiratory: Oropharyngeal swab Nasopharyngeal swab or aspirate Throat swab Pseudo-membrane tissue from affected area Cutaneous: Pus/wound swabs Other: Blood/blood culture Mitral valve	Isolates on Hoyles or Dorset transport medium for identification Clinical samples (swabs – dry or in a transport medium) (for culture + PCR) Stored and transported at cool ambient temperature.	*Corynebacterium diphtheriae* identification Elek and PCR for toxin production	Phenotypic identification (MALDI-ToF) Elek for toxin production and PCR for presence of toxin gene	PCR urgent 1 day/24 hours Non-urgent 2-4 days Culture 3-5 days	Specimens should be submitted with CRDM specimen submission form available on NICD website	CRDM 011 555 0315 011 555 0317 011 555 0327 (Linda de Gouveia) 011 555 0316 (Prof Anne von Gottberg)
Streptococcus pyogenes (Group A Streptococcus)	Respiratory: Throat or nasopharyngeal swab Cutaneous: skin scrapings/lesions Normally sterile site specimen (blood or cerebrospinal fluid [CSF] or other fluids e.g. pleural, peritoneal, synovial	Isolates on blood agar or Dorset transport medium for identification (stored and transported at ambient temperature) Clinical samples (swabs) in Amies transport medium (for culture + PCR) - stored and transported at ambient temperature.	*Streptococcus pyogenes* (Group A Streptococcus)	Phenotypic identification (MALDI-ToF) PCR identification of S.pyogenes Antimicrobial susceptibility testing (disc and minimum inhibitory concentration - MIC)	PCR urgent 1 day/24 hours Non-urgent 2-4 days Culture 3-5 days	Specimens should be submitted with CRDM specimen submission form available on NICD website	CRDM 011 555 0315 011 555 0317 011 555 0327 (Linda de Gouveia) 011 555 0316 (Prof Anne von Gottberg)

Pathogen Species Name (disease/ syndrome, ICD-code)	Samples Collection (E.g. Sample source, type amount, specimen container, transport medium, type of swab)	Specimen Transportation Requirements (Temperature requirements, Stability, Minimum time to reach laboratory)	Tests To Request	Available Tests (Methodology)	Turn-around time	Special Instructions (Case investigations forms to be completed, guidelines, other relevant info)	Department and Contact telephone no's
Streptococcus agalactiae (Group B Streptococcus)	Respiratory: Throat or nasopharyngeal swab Normally sterile site specimen (blood or cerebrospinal fluid [CSF] or other fluids e.g. pleural, peritoneal, synovial)	Isolates on blood agar or Dorset transport medium for identification (stored and transported at ambient temperature) Clinical samples (swabs) in Amies transport medium (for culture + PCR) - stored and transported at ambient temperature.	*Streptococcus agalactiae* (Group B Streptococcus)	Phenotypic identification (MALDI-ToF) PCR identification of *S.agalactaie* Serotyping/ Serogrouping of isolates Antimicrobial susceptibility testing (disc and minimum inhibitory concentration - MIC)	PCR urgent 1 day/24 hours Non-urgent 2-4 days Culture 3-5 days	Specimens should be submitted with CRDM specimen submission form available on NICD website	CRDM 011 555 0315 011 555 0317 011 555 0327 (Linda de Gouveia 011 555 0316 (Prof Anne von Gottberg

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Public Health, Surveillance and Response

The Public Health Surveillance and Response Division includes the Outbreak Unit, the GERMS-SA surveillance programme, Travel Health. The division facilitates communication and data sharing between the national and provincial health departments and the NICD and the public and provides epidemiological input to other NICD units through collaborative projects and support of surveillance and epidemiological activities and outbreak responses.

Outbreak Response Unit

The Outbreak Response Unit (ORU) provides technical support for all aspects of communicable disease outbreaks and control in South Africa. Through close collaboration with provincial and national health departments and other stakeholders, together with systems for early detection and improved reporting of epidemic-prone communicable diseases, the ORU functions as a source of intelligence for outbreak detection and facilitates comprehensive outbreak response activities. In addition, close partnerships with NHLS diagnostic laboratories and NICD centres provide appropriate laboratory diagnostic services during outbreaks and specialised diagnostic testing as required.

Public Health Services

The ORU's role in outbreaks may include, but is not limited to, the following: outbreak detection and reporting, field investigation, development of clinical and laboratory guidelines, management of laboratory data and interpretation of results, and recommendations for prevention and control.

Contact Details

Dr Michelle Groome	+27 11 386 6400	082 374 7345
24/7 Doctor on call/Outbreak Hotline	082 883 9920	

Please refer to the NICD website for further contact information:
http://www.nicd.ac.za/index.php/centres/division-of-public-health-surveillance-and-response/

GERMS-SA

Surveillance/Diagnostic Services

The GERMS-SA laboratory-based surveillance programme for diseases of public health importance is co-ordinated by a core team within the Division of Public Health Surveillance and Response and spans most of the centres at the NICD. Laboratory work is done through the respective Centre. The laboratory surveillance pathogens routinely include: *Streptococcus pneumoniae, Haemophilus influenzae, Neisseria meningitidis, Streptococcus pyogenes, Streptococcus agalactiae, Salmonella* Typhi, *Salmonella enterica* serotype Paratyphi (A, B and C) and *Vibrio cholerae, Cryptococcus* spp., carbapenem-resistant Enterobacteriaceae (CRE) and for outbreak-related *Salmonella* non-Typhi, *Shigella* spp, non-cholera V*ibrio, Campylobacter* spp, Diarrheoagenic *E.coli* and *Listeria* spp. GERMS-SA is an active surveillance programme and relies not only on participating laboratories to submit isolates,

but also makes use of the NHLS Corporate Data Warehouse to ensure that all cases that meet the case definition are included in the various surveillance databases.

The aim of GERMS-SA is to use the data to inform and guide public health policymakers in their decisions. The objectives include estimating the burden of both community- and hospital-acquired infectious diseases under surveillance; monitoring antimicrobial susceptibility trends; monitoring HIV-associated opportunistic infections; and evaluating the impact of vaccines included in the Expanded Programme on Immunisation (EPI). GERMS-SA's work is funded through the NICD/DoH.

GERMS-SA clinic-based surveillance (STI, HIV and TB)

GERMS-SA has expanded to include clinic-based surveillance. Sites have been initiated in all provinces. Clinic-based surveillance includes TB and HIV surveillance to describe the epidemiology of drug resistance among HIV-infected persons initiating ART and/or TB treatment at the selected sites, as well as undertake STI surveillance. The STI component includes surveillance of STI syndrome aetiologies, gonococcal antimicrobial resistance and HPV genotypes among patients attending the clinic's STI.

The Acute Febrile Illness Surveillance Project continues to be incorporated into clinic-based syndromic surveillance at one clinic site in rural Mpumalanga. This surveillance is a One-Health project and takes place in collaboration with veterinary practitioners and researchers from the University of Pretoria Veterinary Faculty. The aim is to describe the prevalence of zoonotic infections in adult patients presenting with acute febrile illness and for whom the clinic sisters would do a malaria test. Laboratory testing includes PCR and serology for brucellosis, bartonella infections, leptospirosis, Q-fever, tick bite fever, West Nile virus, Sindbis, Rift Valley fever and chikungunya virus infections.

Travel Health:

Travel Health was established in 2008 with the aim of being a centre for travel health-related activities and consulting on international health matters. This working group provides pre- and post-travel health advice and consultations for travel health practitioners, as well as for staff of the NHLS and NICD for work related field activities. Regular expert consultations are provided both locally and internationally to international focal points, institutes and health practitioners for South African travellers presenting with infectious diseases after travel within southern Africa and further abroad. These include diseases in travellers such as trypanosomiasis, severe malaria and rickettsial disease (tick bite fever). Consultation is also provided for the elimination of malaria in South Africa and other countries within southern Africa.

NICD Sequencing Core Facility

The NICD Sequencing Core Facility was established in January 2016 to promote and expedite research and surveillance activities at the NICD aimed at providing accurate, high quality and cost-effective next generation sequencing (NGS) solutions. The Sequencing Core Facility currently supports all centres at the NICD in terms of NGS and bioinformatics needs, thus acts as an extension of every centre with regards to NGS capacity. Since its inception, the core facility has continually engaged in several projects from design to completion.

Some key focus areas involve whole genome sequencing (de novo and re-sequencing), custom amplicon sequencing and metagenomics (viral and bacterial). The NICD Sequencing Core Facility currently supports three Illumina MiSeq sequencers. In addition to NGS, the core facility has a dedicated server (genomics server) for data analysis. The genomics server offers secure, powerful, and flexible bioinformatic computing accessible to all NICD scientists. CLC Genomics Server Core aims to provide a unique and stable software architecture core that makes it possible to apply a range of bioinformatics analysis-solutions on high-throughput sequencing data.

Important Considerations:

Sample Requirements: For NGS, accepted sample types include genomic DNA (gDNA), complementary DNA (cDNA), PCR products and amplicons. No original clinical specimens (e.g. swabs, blood, urine, stools, etc.) are accepted. Nucleic acid material (DNA or RNA) can be prepared from any sample source. DNA must be eluted in Tris-Cl buffer, pH 8.5 (not Tris-EDTA buffer). RNA must be eluted in nuclease-free ultra-pure water (not Tris-EDTA buffer) followed by conversion into cDNA. PCR products and cDNA preparations must be purified (recommended) using Agencourt® AMPure® beads or Zymo DNA Clean & Concentrator™-5 kit. DNA Input Recommendations: > 100 ng of DNA, non-degraded and free of particulate matter, double-stranded DNA>70 bp; OD260/280>1.8, minimum concentration 10 ng/uL in 10mM Tris-Cl, pH 8.5. RNA Input Recommendations: 1-4 µg of total RNA, minimum concentration 20 ng/µL in nuclease-free ultra-pure water (do not exceed 50 µL) non-degraded with a Bioanalyzer RIN value of 8. When submitting samples, a Sample Request Form needs to be completed in full and emailed to the laboratory.

Sample Packaging and Transportation: Samples should be submitted to the laboratory in sterile tubes or reaction plates, and sample leak during transportation should be avoided. It is recommended that the cold chain be maintained during sample shipment in order to ensure that nucleic acid integrity is not compromised. Samples should be dispatched in a sealed container and marked appropriately. Courier service must be employed for sample shipment. Dispatching of samples on Fridays and weekends should be avoided so as to keep transportation time to the absolute minimum.

Expected Turnaround Time: Samples have an expected turnaround time of up to two weeks (project-dependent), and this is calculated from sample reception in the laboratory until the sequencing data is sent to the client. Urgent samples (i.e. samples from suspected outbreak cases) are prioritized, and will therefore have a shortened turnaround time. It is imperative that the laboratory is notified of priority samples before they are dispatched.

NGS Applications: The core facility engages in various NGS projects from design to completion, and the key focus areas include whole genome sequencing (de novo and re-sequencing), custom amplicon sequencing, whole transcriptome sequencing, RNA sequencing and metagenomics (viral and bacterial).

Sample Rejection Criteria: All incoming samples are recorded in the Sample Receiving Log Sheet and verification is done to ensure that each sample meets all acceptance criteria. Samples are rejected if they fall in any of the following rejection criteria: unlabelled samples; leaking samples; incorrect sample type (e.g. blood, sputum, urine, swab, etc.); samples not properly labelled; information on sample tube and Sample Request Form not corresponding; insufficient sample volume; samples with very low concentrations; samples received without completed Sample Request Form; sample tubes with illegible handwriting; and samples submitted for tests not performed in the laboratory.

Contact Details (Sequencing Core Facility):

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Telephone no. : 011 386 6459 / 011 386 6322 / 011 555 0450

Shipping address : ATT: Dr Arshad Ismail

Sequencing Core Facility

National Institute for Communicable Diseases

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Specimen Receiving Office			
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Acknowledgement of Reading Form

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My signature confirms that I have read and understood the content of this document and relevant kit insert (where applicable).

Name	Signature	Date

Note to the Quality Rep: - This form must be filed for 5 years to provide audit traceability.