



MINISTRY OF HEALTH
SINGAPORE

MH 70:06/17

MOH Circular No: 13/2023

07 March 2023

Laboratory Heads of Public Hospitals
CEOs and General Managers of Private Hospitals
Managers of Private Laboratories
Director (Environment Health Institute)

UPDATE ON LABORATORY ISOLATES AND SAMPLES FOR PUBLIC HEALTH SURVEILLANCE PROGRAMMES

This circular provides an update on the list of laboratory isolates and samples for public health surveillance programmes under the Infectious Diseases Act (Chapter 137).

Background

2. The National Public Health Laboratory (NPHL) was established by the Ministry of Health in 2007 and is now part of the National Centre for Infectious Diseases (NCID).
3. The NPHL oversees the national laboratory surveillance of infectious diseases and plays a critical role in the investigation of outbreaks of public health concern. NPHL works closely with colleagues in the clinical laboratories and research institutions to enable a coordinated and broad-based response to infectious disease threats of public health importance.
4. Under the Infectious Diseases Act, MOH may require samples to be sent to the NPHL or other designated laboratories for public health surveillance programmes or other epidemiological investigations (please see Annex A).
5. The updated list of pathogens for submission to NPHL is attached in Annex B. In the event of a pandemic or outbreak, other pathogens or samples may be requested.
6. We thank you for your efforts in responding to the requests to send clinical samples and isolates to NPHL, especially during the COVID-19 pandemic, and look forward to your continued support.
7. Please contact NPHL (Annex C) if you need further clarifications on this circular.



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Yours sincerely,

A handwritten signature in cursive script, appearing to read "Heng".

PROF DERRICK HENG
DEPUTY DIRECTOR OF MEDICAL SERVICES (PUBLIC HEALTH GROUP)
MINISTRY OF HEALTH

This Circular supersedes the following circular:

MOH CIRCULAR 26/2018 titled "LABORATORY ISOLATES AND SAMPLES FOR PUBLIC HEALTH SURVEILLANCE PROGRAMMES", dated 17 May 2018



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Annex A

INFECTIOUS DISEASES ACT
(CHAPTER 137)

PART III
CONTROL OF INFECTIOUS DISEASES WITHIN SINGAPORE

Public health surveillance programmes, etc.

7.—(1) The Director may, from time to time, institute public health surveillance programmes or undertake epidemiological investigations or surveys of people, animals or vectors in order to determine the existence, prevalence or incidence, or to determine the likelihood of a possible outbreak, of —

- (a) any infectious disease; or
 - (b) any other disease which the appropriate Minister, by notification in the Gazette, declares to be a disease to which this section applies.
- (2) For the purpose of any public health surveillance programme, epidemiological investigation or survey under subsection (1), the Director may require any person —
- (a) to provide the Director, within or at the times and in the form or manner the Director specifies, with any of the following where the Director requires:
 - (i) any information (known to the person at those times);
 - (ii) any sample of any substance or matter in the possession or control of that person at those times, whether obtained under this Act or otherwise; and
 - (b) to submit to a medical examination at the times the Director specifies.
- (3) If a person who is required by the Director under subsection (2) to furnish the Director with any information or sample, or to submit to any medical examination, fails to do, without reasonable excuse, the person shall be guilty of an offence.
- (4) The Director may send any sample obtained under subsection (2)(a)(ii) for such test, examination or analysis as the Director may consider necessary or expedient.



Annex B: Pathogen List and Preferred Sample Type

The updated list of pathogens requested for submission to NPHL (added pathogens are highlighted) is as follows. In the event of a pandemic or outbreak, other pathogens or samples may be requested.

Pathogen	Sample Type	Selection Criteria	Remark
<i>Burkholderia pseudomallei</i> or <i>Burkholderia mallei</i>	<ul style="list-style-type: none"> Isolate 	<ul style="list-style-type: none"> All positive cases 	<ul style="list-style-type: none"> Labs using Bruker MALDI-TOF should send isolates and mass spectra plots (via email) to NPHL on the same day. To inform NPHL before sample dispatch and NPHL will provide instructions on the transport.
<i>Candida auris</i>	<ul style="list-style-type: none"> Isolate 	<ul style="list-style-type: none"> All positive cases 	<ul style="list-style-type: none"> MOH Surveillance Submission Form must be filled up.
Chikungunya virus	<ul style="list-style-type: none"> Serum or plasma 	<ul style="list-style-type: none"> All IgM or PCR positive samples 	<ul style="list-style-type: none"> MOH Surveillance Submission Form must be filled up.
<i>Clostridioides difficile</i>	<ul style="list-style-type: none"> Isolate or Liquid or non-formed stool 	<ul style="list-style-type: none"> For routine surveillance, up to 5 (<i>C. difficile</i> toxin-positive) samples per hospital per month Suspected cluster/ outbreak investigations 	<ul style="list-style-type: none"> Isolates should be sent as pure culture using swab in appropriate transport media for anaerobic bacteria. Only liquid/ non-formed stool will be processed. All samples should be



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Pathogen	Sample Type	Selection Criteria	Remark
			<p>transported in tightly sealed, leakproof plastic containers.</p> <ul style="list-style-type: none"> • Submission Form for <i>Clostridioides difficile</i> Surveillance must be filled up and sent to NPHL with sample/ isolate.
<i>Corynebacterium diphtheriae</i>	<ul style="list-style-type: none"> • Isolate 	<ul style="list-style-type: none"> • All positive cases 	<ul style="list-style-type: none"> • Isolates should be sent as pure culture with MOH Surveillance Submission Form.
Dengue virus	<ul style="list-style-type: none"> • Serum or plasma 	<ul style="list-style-type: none"> • All PCR, NS1 and/ or IgM positive cases 	<ul style="list-style-type: none"> • MOH Surveillance Submission Form must be filled up, or • For laboratories/ hospitals with existing arrangements with MOH/ NPHL, follow existing arrangements with MOH/ NPHL to submit the samples.
<i>Escherichia coli</i> O157/ STEC	<ul style="list-style-type: none"> • Isolate or • Liquid or non-formed stool 	<ul style="list-style-type: none"> • All cases positive by O157-specific PCR or Immunoassay • Suspected STEC cluster/ outbreak investigations • Isolate identified as STEC 	<ul style="list-style-type: none"> • Isolates should be sent as pure culture with MOH Surveillance Submission Form.
<i>Haemophilus influenzae</i> serotype b (Hib)	<ul style="list-style-type: none"> • Isolate 	<ul style="list-style-type: none"> • All positive cases from invasive samples only, including CSF, blood and other sterile sites. 	<ul style="list-style-type: none"> • Isolates should be sent as pure culture with MOH Surveillance Submission Form.
Hepatitis E virus	<ul style="list-style-type: none"> • Serum or plasma 	<ul style="list-style-type: none"> • PCR and/ or IgM positive case 	<ul style="list-style-type: none"> • MOH Surveillance Submission Form must be filled up, or • For laboratories/ hospitals with existing arrangements with MOH/ NPHL, follow existing arrangements with MOH/ NPHL to submit the samples.



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Pathogen	Sample Type	Selection Criteria	Remark
Human Immunodeficiency Virus (HIV)	<ul style="list-style-type: none">• Plasma (EDTA) and/or• Whole blood (EDTA/CPD/ CPDA)	<ul style="list-style-type: none">• All positive cases by serology/ PCR• Samples requested by MOH	<ul style="list-style-type: none">• MOH Surveillance Submission Form must be filled up, or• For laboratories/ hospitals with existing arrangements with MOH/ NPHL, follow existing arrangements with MOH/ NPHL to submit the samples.
Influenza viruses	<ul style="list-style-type: none">• Nasal or throat swab or respiratory specimen in UTM/ VTM and/ or RNA extract	<ul style="list-style-type: none">• Vaccine failure case• Untyped influenza A positive samples• Untypable influenza A samples (including influenza A subtype indeterminate or no subtype detected)• Suspected antiviral resistance• Severe case• Any unusual strain or case under investigation by MOH	<ul style="list-style-type: none">• MOH Surveillance Submission Form must be filled up, or• For laboratories/ hospitals with existing arrangements with MOH/ NPHL, follow existing arrangements with MOH/ NPHL to submit influenza samples.
<i>Legionella</i> spp.	<ul style="list-style-type: none">• Clinical specimens – e.g. sputum, BAL or lung tissue or• Isolate	<ul style="list-style-type: none">• All positive cases	<ul style="list-style-type: none">• MOH will request for fresh clinical samples e.g. sputum, BAL or lung tissue to be sent to SGH Bacteriology Lab for culture based on MD131 notification form.• Isolates should be sent as pure culture with MOH Surveillance Submission Form for Legionella Isolation.



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<i>Leptospira</i> spp.	<ul style="list-style-type: none"> Clinical specimens – e.g. blood, serum and/ or urine samples 	<ul style="list-style-type: none"> Suspect <i>Leptospira</i> cases Cases with positive IgM or PCR result 	<ul style="list-style-type: none"> Clinical background for suspect <i>Leptospira</i> cases should be sent to NPHL for review before sending clinical samples with unknown serology result. NPHL will perform PCR on clinical samples. MOH Surveillance Submission Form must be filled up.
<i>Listeria monocytogenes</i>	<ul style="list-style-type: none"> Isolate 	<ul style="list-style-type: none"> All positive cases 	<ul style="list-style-type: none"> Isolates should be sent as pure culture with MOH Surveillance Submission Form.
Measles and Rubella viruses	<ul style="list-style-type: none"> Nasal, throat or nasopharyngeal swab in UTM /VTM and/or Serum or plasma 	<ul style="list-style-type: none"> All clinical samples submitted for PCR or IgM testing 	<ul style="list-style-type: none"> MOH Measles and Rubella Surveillance Submission Form must be filled up; or For laboratories/ hospitals with existing arrangements with MOH/ NPHL, follow existing arrangements with MOH/ NPHL to submit the samples.
Middle East Respiratory Syndrome Coronavirus (MERS-CoV)	<ul style="list-style-type: none"> Respiratory samples such as nasopharyngeal swab, throat swabs, mid-turbinate swabs in UTM 	<ul style="list-style-type: none"> Suspected cases as requested by MOH All PCR positive samples 	<ul style="list-style-type: none"> MOH Surveillance Submission Form must be filled up, or For laboratories/ hospitals with existing arrangements with MOH/ NPHL, follow existing arrangements with MOH/ NPHL to submit the samples.
(Multi)drug-resistant bacteria as specified	<ul style="list-style-type: none"> Isolate 	<ul style="list-style-type: none"> Carbapenem-resistant <i>Enterobacterales</i> and other Multidrug-resistant bacteria as requested 	<ul style="list-style-type: none"> Upon advance notice or on MOH request as part of outbreak investigation. Isolates should be sent as pure culture.



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Pathogen	Sample Type	Selection Criteria	Remark
		<ul style="list-style-type: none"> Annual surveillance of selected species and investigation of suspected cluster and outbreak PHI laboratories will be notified of selection criteria by email in advance 	<ul style="list-style-type: none"> Results of antibiotic sensitivity test need to be attached. Submission Form for Multidrug-Resistant Bacteria Surveillance must be filled up.
<i>Mycobacterium tuberculosis</i>	<ul style="list-style-type: none"> Genomic DNA extracted from isolate 	<ul style="list-style-type: none"> As agreed with or instructed by NTBP 	<ul style="list-style-type: none"> Follow existing arrangements with NTBP/ TBCU/ NPHL to submit TB samples via CTBL or NUH TB lab. Other <i>Mycobacterium tuberculosis</i> complex (MTC) species, eg. BCG may also be requested by MOH. Submission Form for Mycobacterium tuberculosis DNA Whole Genome Sequencing must be filled up and sent to NPHL with genomic DNA.
<i>Neisseria meningitidis</i>	<ul style="list-style-type: none"> Isolate or Clinical specimen e.g. blood, CSF samples 	<ul style="list-style-type: none"> All positive cases from invasive samples only, including CSF, blood and other sterile sites PCR positive clinical specimens from sterile sites for which culture was negative/ not done 	<ul style="list-style-type: none"> Isolates should be sent as pure culture to NPHL to determine the serotype. NPHL will perform serotyping PCR for culture negative clinical specimens. MOH Surveillance Submission Form must be filled up.
Norovirus	<ul style="list-style-type: none"> Clinical specimen, e.g. stool 	<ul style="list-style-type: none"> Samples requested by MOH for outbreak investigations Either EIA or PCR positive 	<ul style="list-style-type: none"> MOH Surveillance Submission Form for Stool Specimen or MOH Surveillance Submission Form must be filled up, or For laboratories/ hospitals with existing arrangements with MOH/ NPHL, follow



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Pathogen	Sample Type	Selection Criteria	Remark
			existing arrangements with MOH/ NPHL to submit the samples.
<i>Plasmodium spp</i>	<ul style="list-style-type: none"> Slides (thin and thick) and EDTA or ACD blood 	<ul style="list-style-type: none"> All positive cases 	<ul style="list-style-type: none"> Submission Form for Malaria Sample must be filled up and sent to NPHL with sample and slides.
<i>Salmonella spp.</i>	<ul style="list-style-type: none"> Isolate or Clinical specimen (please refer to next column) 	<ul style="list-style-type: none"> All non-typhoid positive cases unless already typed e.g. <i>Salmonella</i> enteritidis All isolates on MOH request for outbreak investigations All <i>S. Typhi</i> and <i>S. Paratyphi A</i> and <i>C</i> Clinical specimens which tested PCR positive for <i>Salmonella</i> spp. but no culture has been requested AND no reflex culture done 	<ul style="list-style-type: none"> Isolates should be sent as pure culture with Submission Form for <i>Salmonella</i> Serotyping. Isolates should be sent as pure culture with MOH Surveillance Submission Form.
Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)	<ul style="list-style-type: none"> Respiratory samples such as nasopharyngeal swab, throat swabs, mid-turbinate swabs in UTM 	<ul style="list-style-type: none"> Samples requested by MOH 	<ul style="list-style-type: none"> MOH Surveillance Submission Form must be filled up, or For laboratories/ hospitals with existing arrangements with MOH/ NPHL, follow existing arrangements with MOH/ NPHL to submit the samples.
<i>Shigella spp.</i>	<ul style="list-style-type: none"> Isolate or Clinical specimen (please refer to next column) 	<ul style="list-style-type: none"> All positive cases Clinical specimens which are tested PCR positive for <i>Shigella</i> spp. but no culture has been requested AND no reflex culture done 	<ul style="list-style-type: none"> Isolates should be sent as pure culture, MOH Surveillance Submission Form must be filled up. Clinical specimens should be sent with Submission Form for Stool Culture of PCR-positive samples.



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<i>Streptococcus agalactiae</i> (Group B <i>Streptococcus</i>)	<ul style="list-style-type: none"> Isolate 	<ul style="list-style-type: none"> Samples requested by MOH for public health investigation From invasive samples only, including CSF, blood and other sterile sites 	<ul style="list-style-type: none"> Isolates should be sent as pure culture with MOH Surveillance Submission Form.
<i>Streptococcus pneumoniae</i>	<ul style="list-style-type: none"> Isolate 	<ul style="list-style-type: none"> All positive cases from invasive samples only, including CSF, blood and other sterile sites 	<ul style="list-style-type: none"> Submission Form for <i>Streptococcus pneumoniae</i> Serotyping must be filled up and sent to NPHL with sample. Known cases of vaccine breakthrough infection should be highlighted. Isolates should be sent as pure culture preferably using swabs in transport media (M40 Transystem); other media which maintains viability are acceptable, but note that <i>S. pneumoniae</i> tends to autolyze after one day.
<i>Streptococcus pyogenes</i> (Group A <i>Streptococcus</i>)	<ul style="list-style-type: none"> Isolate 	<ul style="list-style-type: none"> All positive cases from sterile sites 	<ul style="list-style-type: none"> Isolates should be sent as pure culture with MOH Surveillance Submission Form.
Suspect High Risk Bacterial Pathogens (e.g. <i>Bacillus anthracis</i>, <i>Brucella</i> spp., <i>Clostridium botulinum</i>, etc.)	<ul style="list-style-type: none"> Isolate or Clinical specimens (eg. blood, stool or CSF) 	<ul style="list-style-type: none"> Bacterial pathogens listed under First and Second Schedules of Biological Agents and Toxins Act (BATA) For other unknown pathogens or if in doubt, please contact NPHL 	<ul style="list-style-type: none"> To contact NPHL before sample dispatch. Transport of suspect high-risk pathogens must be in compliance with existing biosafety requirements.
<i>Vibrio</i> spp.	<ul style="list-style-type: none"> Isolate or Clinical specimen (please refer to next column) 	<ul style="list-style-type: none"> All <i>V. cholerae</i> isolates <i>V. parahaemolyticus</i> and other <i>Vibrio</i> spp. isolates (only on request by MOH) 	<ul style="list-style-type: none"> Isolates should be sent as pure culture with MOH Surveillance Submission Form.



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Pathogen	Sample Type	Selection Criteria	Remark
		<ul style="list-style-type: none">Clinical specimens which tested PCR positive for <i>V. cholerae</i> but no culture has been requested AND no reflex culture done	<ul style="list-style-type: none">Clinical specimens should be sent with Submission Form for Stool Culture of PCR-positive samples.
Zika virus	<ul style="list-style-type: none">Serum, plasma and/or urine	<ul style="list-style-type: none">All PCR, and/ or Zika IgM positive cases	<ul style="list-style-type: none">MOH Surveillance Submission Form must be filled up, orFor laboratories/ hospitals with existing arrangements with MOH/ NPHL, follow existing arrangements with MOH/ NPHL to submit the samples.



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Annex C: Laboratory Contact Details

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The submission forms for the various pathogens are attached below.



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