MINISTRY OF HEALTH
MALAYSIA

CASE DEFINITIONS FOR INFECTIOUS DISEASES IN MALAYSIA

Disease Control Division
Ministry of Health Malaysia

3rd Edition
January 2017

FOREWORD

Both in Malaysia and globally, infectious diseases remain a public health priority. There are many diverse problems posed to health care systems from infectious diseases, these include; increasing trends of antimicrobial resistant bacteria, vector borne diseases and vaccine preventable diseases. In addition, emerging and re-emerging diseases such as Zika Virus Disease, MERS-CoV and Ebola as well as bio-terrorism pose additional threats to our public health services.

Addressing these threats posed by infectious diseases would need the strengthening of infectious disease surveillance, wherein enhancing our ability for early disease detection, prompt containment of these diseases and the prevention of unusual occurrences of infectious disease. Vigilance and disease intelligence is fundamental in ensuring prompt identification of emerging infectious disease. The key component of this surveillance is the application of the mandatory notification of Infectious Diseases under the Prevention and Control of Infectious Diseases Act 1988 (Act 342).

This revised and updated third edition of the Case Definitions for Infectious Diseases in Malaysia is timely and will serve as an invaluable guide to assist all medical professionals to notify infectious diseases in a prompt and systematic manner. It is my sincere hope that all health care personnel will make use of this guide to enhance the Surveillance and subsequently the control of Infectious Diseases in Malaysia.

Finally, I wish to thank everyone who was involved in the revision of this guide and to the Surveillance Section, Disease Control Division for coordinating this revision process.

Datuk Dr Lokman Hakim Bin Sulaiman
Deputy Director General of Health (Public Health)
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INTRODUCTION

Surveillance system involves health staff from multi-disciplines, either in government or non-government health facilities. Effective infectious disease surveillance will "contribute to" an effective control of the disease. An effective surveillance system needs to have standards in terminology, reporting formats and methods in order to ensure quality of the surveillance system and to enable easier/consumer friendly participation by those involved.

This third edition of the Case Definitions for Infectious Diseases in Malaysia has incorporated the latest updates of disease case definitions, revised and updated diagnostic methods,updates on contact details, reference laboratories, notification requirements and mechanisms. In addition, this revision has been tailored and edited according to our local needs and the requirement of the current Ministry of Health notification system.

This case definition booklet will serve as a guide for all medical professionals including the medical assistants and the nurses who notify infectious diseases. The standard case definitions will harmonise the surveillance activities of these notifiable diseases. The diseases selected have ICD-10 codes for standard reporting and international data exchange. The contact telephone & fax numbers of the nearest health offices and relevant departments are included in this booklet for easy reference or in case of any doubt as to who to notify.

Goals

To facilitate the control of the infectious diseases under surveillance by identifying the following:

a. Prevailing incidence levels, impacts and trends to assist in the development of feasible objectives for prevention and control of the diseases and the evaluation of control programs.
b. Epidemiologic patterns and risk factors associated with the diseases to assist in the development of intervention strategies.
c. Detection of outbreaks for the purpose of timely response, investigations and effective implementation of control measures.

Quality

If surveillance is considered necessary for any particular infectious disease, then the surveillance must be carried out in such a manner as to be of the highest epidemiologic quality. This implies the following:

a. Use of standard case definitions uniformly across the country for these notifiable

infectious diseases.

b. Collection of sufficient, appropriate epidemiologic data on cases and identify preventable cases.

c. Timely transmission of these data from local to district Medical Officer of Health, State and National (Disease Control Division, Ministry of Health) level for analysis, interpretation & trending of the infectious disease pattern.

d. Use of the data to enhance control programmes and assist in the development of realistic objectives for reducing the number of preventable cases.

e. Periodic effectiveness and cost-benefit evaluation of the surveillance system and the progress achieved in the control of these infectious diseases.

Reporting of Infectious Disease

a. Reporting or notifying of infectious diseases is mandated by the Prevention and Control of Infectious Disease Act 1988. The Prevention and Control of Infectious Diseases (Notice Form) regulations was gazetted in 1993, and currently a total of 28 infectious diseases conditions are required to be notified by law.

b. The use of these case definitions which provides standardized criteria for the reporting of cases will enhance the quality of data received under the national notification of infectious diseases.

c. In most instances, only confirmed cases are reported. A combination of clinical, laboratory and epidemiologic criteria is used to classify these cases.

d. These case definitions include a brief clinical description which is intended for the purpose of notifying & classifying cases and should not be used for making clinical diagnosis by the attending physicians.

e. Probable or suspected cases may be described in the case classification to assist local public health authorities in carrying out their public health mandate, such as outbreak investigation, contact tracing and prevention & control measures in a timely manner.

f. Physicians diagnosing cases of specific (notifiable) infectious diseases should report these cases based on clinical diagnosis with/without laboratory confirmation to the district health authorities. These authorities are responsible for determining that the cases meet the surveillance case definitions before they officially register the cases. Where there is uncertainty because of missing data or the results are inconclusive, it may be reported as a probable or suspected case, but the status must be confirmed later. The district health authority registering & reporting the case collects all necessary epidemiologic data on it.

g. The reporting of a case should be timely and need not be delayed until all epide miologic data are available. Such data may be reported later and added to the original case report centrally. While district health authorities are encouraged to collect all information requested by the reporting system, when some items are not available the case should be reported with missing items listed as unknown. A case should never go unreported or deleted because of missing data. The only exception is when data to determine whether the case meets the case definition are missing. Such cases should not be reported.

How to Use Information in This Report

These case definitions are to be used for identifying and classifying cases, both of which are often done retrospectively, for national reporting purposes. They should not be used as criteria for public health action. For many conditions of public health importance, action to contain disease should be initiated as soon as a problem is identified; in many circumstances, appropriate public health action should be under-taken even though insufficient information is available to determine whether cases meet the case definition.

Terms that are used in case classification are defined as:

Clinically compatible case: a clinical syndrome generally compatible with the disease, as described in the clinical description.

Suspected case: A case that is classified as suspected for reporting purposes: is usually a case with the clinical criteria as described in the case definition without epidemiological or laboratory evidence of the disease in question. The definition of a possible case has high sensitivity and low specificity. It allows for detection of most cases but some false positives cases will be included into this category.

Probable case: A case that is classified as probable for reporting purposes: is usually a case with clinical criteria and an epidemiological link as described in the case definition. Laboratory tests for probable cases are specified only for some diseases.

Confirmed case: A case that is classified as confirmed for reporting purposes: should be laboratory confirmed and may fulfill the described clinical case definition or not. The definition of a confirmed case is highly specific and less sensitive; therefore most of the collected cases will be true cases although some will be missed.

This revision included the addition of 8 case definitions for disease conditions of Public Health importance which include, Severe Acute Respiratory Infection (SARI), Leptospirosis, HFMD, Brucellosis, Melioidosis, MERS-CoV, Conjunctivitis and Zika Virus Disease. In addition, major revisions were made on 10 of the existing case definitions based on

current updates of the disease literature, namely Ebola-Marburg Viral Diseases, Food Poisoning, Leprosy (Hansen's disease), Acute Poliomyelitis, Salmonellosis, Tuberculosis, Acute Flaccid Paralysis (AFP), Rubella - Adult Type, Rubella - Congenital Syndrome, and Influenza-like Illness (ILI). Furthermore, minor revisions, reorganization and updates were carried out on all existing Case Definitions for disease conditions from the previous edition.

In this third edition, disease conditions also included several new and emerging infectious diseases, zoonotic diseases and case definitions of syndromic diseases that are not made notifiable yet, but have emerged in Malaysia and are under our surveillance system due to their significant Public Health importance.

For further information, comment and suggestion, please contact

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ACUTE FLACCID PARALYSIS (AFP)

Case Definition

Clinical case definition

Any child age less than 15 years developed an acute onset of flaccid paralysis should have poliovirus infection ruled out.

Laboratory workout

Two stool specimens should be collected with interval between the first and second stool at least 24 hours apart; and both samples are taken within 14 days of onset of paralysis. It is classified as adequate stool.

Case Classification

- **Discard 1**: AFP case with adequate stool and on follow-up after 60 days of onset, has no residual paralysis.
- **Discard 2:** AFP case with inadequate stool and on follow-up after 60 days of onset, has no residual paralysis.
- **Discard 3:** AFP case with inadequate stool with residual paralysis on 60 days follow-up OR loss to follow-up OR died before 60 days follow-up. Classification done by the Expert Group Review.

Types of Surveillance

Based on AFP Surveillance System.

Outbreak situations

The detection of any acute poliomyelitis in Malaysia will be considered a national emergency. In this situation it is vital to immediately activate the National Contingency Plan for detection and Response to Importation of Wild Poliovirus Infection. All outbreaks should be investigated IMMEDIATELY.

Special Aspects

Nil.

Reference Laboratory

IMR: The reference laboratory for Poliomyelitis Eradication Programme in Malaysia.

Contact Information

VPD & FWBD Sector	Tel: 03 – 8883 4421 / 4504
Disease Control Division	Fax: 03 – 8888 6270
Ministry of Health	E-mail: cprc@moh.gov.my

ACUTE POLIOMYELITIS (ICD 10: A 36)

Case Definition

Clinical case definition

A disease due to poliovirus infection, often characterised by an acute onset of flaccid paralysis.

Criteria for diagnosing acute poliomyelitis

- poliovirus is isolated (either wild type or vaccine strain) OR
- positive serology (4 fold or greater rise in Ab) OR
- epidemiological linkage to confirmed case.

Case Classification

Suspected

A case compatible with the clinical description.

Confirmed

A case with any of the above criteria for diagnosis.

Types of Surveillance

Mandatory notification under the Prevention and Control of Infectious Disease Act 1988.

Immediate reporting

The detection of any wild poliovirus requires **URGENT ATTENTION.**

How to notify

An acute poliomyelitis case should be notified by phone to the nearest District Health Office within 24 hours of diagnosis. It is then followed by submission of the notification form.

Outbreak situations

The detection of any wild poliovirus or any acute poliomyelitis case in Malaysia is considered a national emergency. In this situation it is vital to immediately activate the National Plan of Action for the Importation of Wild Poliovirus. All outbreaks should be investigated **IMMEDIATELY.**

Vaccine Associated Paralytic Poliomyelitis (VAPP)

Criteria for Diagnosis of VAPP

- Clinical polio and no epidemiological links with wild virus confirmed or outbreak associated polio cases,
- History of recent exposure to OPV,

- 'Adequate' stool specimens negative for wild virus,
- Stool positive for Sabin, test done in WHO accredited lab,
- Other causes of AFP are ruled out,
- Polio-like sequelae (residual paralysis) at 60-day follow-up,
- Review and diagnosis by 'Expert Review Committee'.

Types of VADP

i. **Recipient VAPP**

RECIPIENT VAPP - AFP with onset of paralysis 4 - 30 days after receiving OPV dose **AND** presence of neurological sequelae compatible with poliomyelitis for 60 days or more from date of paralysis onset; **AND** isolation of vaccine-derived poliovirus from the stools.

ii. **Contact VAPP**

CONTACT VAPP - paralytic polio in which patient has known contact with vaccinee who received OPV within 7 - 70 days, and the contact occurred 4 - 30 days before paralysis onset of the patient.

Special Aspects

Poliomyelitis has been eradicated in Malaysia since year 2000. However its surveillance is continued and a proxy surveillance of acute flaccid paralysis (AFP) is carried out too (refer attachment).

References Laboratory:

IMR: is the referral laboratory for poliovirus work.

Contact Information

VPD & FWBD Sector
Disease Control Division
Ministry of Health

Tel: 03 – 8883 4421 / 4504
Fax: 03 – 8888 6270
E-mail: cprc@moh.gov.my

AIDS
(ICD 10: B20-B21-B23-B24)

Case Definition

Clinical case definition

For the purpose of epidemiological surveillance, an adult (>12 years of age) is considered to have AIDS if tested positive for HIV antibody, and one or more of the following is present:

- 10% body weight loss or cachexia, with diarrhoea or fever, or both, intermittent or constant, for at least 1 month, not known to be due to a condition unrelated to HIV infection.
- Cryptococcal meningitis.
- Pulmonary or extra-pulmonary tuberculosis.
- Kaposi sarcoma.
- Neurological impairment that is sufficient to prevent independent daily activities not known to be due to a condition unrelated to HIV infection (for example, trauma or cerebrovascular accident).
- Candidiasis of the oesophagus (which may presumptively be diagnosed based on the presence of oral candidiasis accompanied by dysphagia).
- Clinically diagnosed life-threatening or recurrent episodes of pneumonia, with or without etiological confirmation.
- Invasive cervical cancer.

Case Classification

Confirmed

Clinical evidence with laboratory confirmation.

Types of Surveillance

Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988.

When to notify

Any HIV positive case with signs of AIDS should be notified. Notification is made only once for any AIDS cases.

How to notify

An AIDS case should be notified within a week (7 days) to the nearest District Health Office through submission of the notification form.

Contact Information

HIV/STI/Hepatitis C Sector
Disease Control Division
Ministry of Health

Tel: 03-8883 4262
Fax: 03-8883 4285
E-mail: cprc@moh.gov.my

AVIAN INFLUENZA (AI) IN HUMAN (ICD 10: J 09)

Case Definition

Suspected case

A: **Any individual presenting with fever (temperature >38°C)**

AND

one or more of the following symptoms : cough; **sore throat; shortness of breath;**

AND

history of having been in direct contact with dead birds / poultry during the last ≤ 10 days prior to the onset of symptoms and the dead poultry or birds are under investigation of Department of Veterinary Services (DVS)/Department of Wildlife & National Park (PERHILITAN),

OR

living within / history of visiting to **300 meter radius** from the index house / farm of the confirmed AI among birds/chickens in an affected area gazetted by Department Veterinary Services (DVS) **AND** having been in direct contact with birds / poultry during the last ≤ 10 days prior to the onset of symptoms,

OR

living outside the 300 meter radius but within **10 kilometer radius** from the index house / farm of the confirmed A/H5 among birds/chickens in an affected area gazetted by DVS **OR** history of visiting that area **AND** having been in direct handling with **dead or ill birds / poultry** in that area during the last≤ 10 days prior to the onset of symptoms,

OR

having **worked in a laboratory** during ≤ 10 days prior to the onset of symptoms where there is **processing** of samples from human or animals that are **suspected of having AI** infection,

OR

history of visit to country with AI outbreak during the last ≤ 10 days prior to the onset of symptoms.

B: Death from an unexplained acute respiratory illness

AND

one or more of the following:

- residing within 1 kilometer area where AI is suspected or confirmed in human or animal;
- having been in direct contact during the last ≤ 10 days prior to the onset of symptoms with a confirmed case of AI among poultry or human during its infectious period (starting from a day before the onset of symptoms up to ≤ 10 days after onset of symptoms).

Probable Case

A suspected case for whom laboratory diagnostic testing is positive for influenza A, negative for H1, H1pdm09 and H3 by real-time reverse transcriptase polymerase chain reaction (rRT-PCR), and therefore non-subtypeable.

Confirmed Case

An individual for whom laboratory testing demonstrates one or more of the following:

- positive viral isolate for Influenza A/Avian Strain; OR
- positive Real Time Reverse Transcriptase Polymerase Chain Reaction (rRT-PCR) for Influenza A virus/Avian Strain; OR
- DNA sequencing which shows evidence of Influenza A virus/Avian Strain; OR
- immunofluorescence antibody (IFA) test positive using Influenza A/Avian Strain monoclonal antibodies; OR
- 4-fold rise or more in Influenza A virus/Avian Strain specific antibody titre in paired serum samples which is taken 14 days apart.

Case Classification

Suspected Case

A case that meets the suspected case definition.

Probable Case

A suspected case for whom laboratory diagnostic testing is positive for influenza A, negative

for H1, H1pdm09 and H3.

Confirmed

A suspected/probable case in which laboratory investigation confirms the presence of influenza virus of avian origin i.e. H5 and H7 in a clinical specimen.

Laboratory confirmation is **NOT** required for initial management of patient (isolation) and notification of case.

Types of Surveillance

Mandatory Surveillance.

When to notify

All suspected, probable and confirmed case is mandatory to be notified to nearest District Health Office within 24 hours of diagnosis.

How to notify

Notification done via eNotifikasi system or through submission of the notification form to the nearest District Health Office.

Reference Laboratory

Institute of Medical Research (IMR).
National Public Health Laboratory (NPHL).

References

Alert, Enhanced Surveillance and Management of Avian Influenza in Human (2004, MOH). Avian Influenza A(H7N9): Pengurusan Pesakit di Fasiliti Kesihatan Kerajaan dan Swasta (2014, MOH). National Influenza Pandemic Preparedness Plan (2010, MOH).

Contact Information

Zoonosis Sector
Disease Control Division
Ministry of Health

Tel: 03-88834420
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BRUCELLOSIS (ICD 10: A23)

Case Definition

Clinical case definition

An illness characterized by acute or insidious onset of fever AND one or more of the following symptoms: night sweats, fatigue, anorexia, myalgia, weight loss, headache, arthralgia, arthritis/spondylitis, meningitis, or focal organ involvement (endocarditis, orchitis / epididymitis, hepatomegaly, splenomegaly).

WITH

History of exposure to probable sources of infection.

Laboratory criteria for diagnosis

Laboratory confirmation is required for notification.
All probable and confirmed cases should be notified to the nearest District Health Office within 1 week of the date of laboratory diagnosis

Case Classification

Clinical

A case that is compatible with the clinical description.

Probable

A clinically compatible illness.

WITH

a) Presumptive laboratory evidence of Brucella infection by positive IgM or IgG titre;

WITH

b) Epidemiological link to a confirmed Brucellosis case.

Confirmed

A clinically compatible illness with definitive laboratory evidence of Brucella infection from either one of the following methods:

- Isolation of Brucella species from clinical samples.
- Evidence of a fourfold or greater rise in Brucella antibody titre between acute- and convalescent-phase serum specimens obtained two or more weeks apart.
- Blood sample positive by PCR.

Types of Surveillance

When to notify
Within one week of diagnosis.

How to notify
Notification by notification form.

Outbreak situations
An outbreak is defined as more than one probable or confirmed cases of leptospirosis with an epidemiological link within one incubation period (60 days).

Special Aspects
As Brucellosis is not notifiable under the Prevention and Control of Infectious Diseases Act 1988, notification is made by an administrative order. For the purpose of notification, all probable and confirmed cases should be notified to the nearest District Health Office within 1 week from the date of laboratory diagnosis.

Reference Laboratory
Institute of Medical Research (IMR).

References
Guidelines for the Diagnosis, Management, Prevention and Control of Brucellosis in Malaysia (2012).

Contact Information

Zoonosis Sector
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Ministry of Health

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Email : zoonosis@moh.gov.my

CHANCROID
(ICD 10: A 51)

Case Definition

Clinical case definition

- A sexually transmitted disease characterized by 1 or more painful genital ulcers with/ without regional lymphadenopathy.

Laboratory criteria for diagnosis

- Isolation of Haemophilus ducreyi.

Case Classification

Confirmed

A clinical compatible case that is laboratory confirmed by the isolation of H. ducreyi.

OR

Probable / Suspected

Clinical compatible case with the exclusion presence of

- Primary syphilis by dark-field examination of exudates or by serological test for syphilis performed at least 7 days after onset of ulcer.
- Herpes *genitalis* (painful grouped erosions/ vesicles).

Types of Surveillance

Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988.

When to notify

Only a positive Chancroid case with symptoms and signs on infection should be notified.

How to notify

The Chancroid case should be notified within a week (7 days) to the nearest District Health Office through submission of the notification form.

Contact Information

HIV/STI/Hepatitis C Sector
Disease Control Division
Ministry of Health

Tel: 03-8883 4262
Fax: 03-8883 4285
E-mail: cprc@moh.gov.my

CHOLERA
ICD 10: A 00

Case Definition

Clinical case definition
Acute watery diarrhoea with or without vomiting.

Laboratory criteria for diagnosis
Isolation of *Vibrio cholerae* O1 or O139 from stools in patient with diarrhoea or body fluids.

Case Classification

Suspected
A case that meets the clinical case definition.

Confirmed
A suspected case that is laboratory-confirmed.

Types of Surveillance
Mandatory notification under the Prevention and Control of Infectious Disease Act 1988.

When to notify
All suspected cholera cases shall be notified but only laboratory confirmed cases should be registered. An asymptomatic person with positive Vibrio cholera need not be registered but must be notified for prevention and control activities.

How to notify
A cholera case should be notified to the nearest District Health Office within 24 hours of diagnosis.

Outbreak situations
During outbreak situation, surveillance should be intensified with active case finding (ACD). Stool culture for V. cholerae must be performed to symptomatic cases. High rectal swab is preferred than normal rectal swab should stool culture not logistically possible in outbreak investigation.

Special Aspects
Prophylaxis maybe given to asymptomatic close contacts, once high rectal swab has been taken.

Reference Laboratory
IMR: Identify the specific strain and biotypes; it is compulsory for the affected districts or hospitals to send samples/isolates to IMR for fingerprinting.

Contact Information

VPD & FWBD Sector
Disease Control Division
Ministry of Health

Tel: 03 – 8883 4421 / 4503
Fax: 03 – 8888 6270
E-mail: cprc@moh.gov.my

CONJUNCTIVITIS (ICD 10: H10)

Case Definition

Clinical case definition

Conjunctivitis refers to any inflammatory condition of the membrane that lines the eyelids and covers the exposed surface of the sclera. Eye redness (hyperaemia), swelling of conjunctiva (chemosis) and watering (epiphoria) of the eyes are common symptoms to all forms of conjunctivitis.

Note: Conjunctivitis may be highly contagious if caused by bacteria or viruses. Other causes such as allergy-inducing agents and irritants are not considered to be contagious.

Laboratory criteria for diagnosis

Isolation by culture method or detection by polymerase chain reaction (PCR) of the causative agent from a normally sterile site (i.e. sample of eye secretions from the conjunctiva) indicates infection.

Laboratory tests are not usually required to diagnose mild conjunctivitis. However, testing is indicated in cases experiencing a more severe form of conjunctivitis, chronic or recurrent conjunctivitis as well as in patients who do not respond to treatment or in the occurrence of an outbreak.

Viral: Adenovirus (serotypes 3, 7, 8, 19), Enterovirus 70, Coxsackievirus A 24 and Herpes simplex virus.

Bacterial: *Staphylococcus aureus (common in adult), Staphylococcus epidermidis, Streptococcus pneumoniae, Haemophilus influenzae, Moraxella catarrhalis, Neisseria gonorrhoeae (in newborns) and Chlamydia trachomatis (in newborns).*

CASE CLASSIFICATION

Suspected

A case that meets the clinical case definition.

Confirmed

A case that is laboratory confirmed or that meets the clinical case definition and is epidemiologically linked to a laboratory-confirmed case.

DIFFERENTIAL DIAGNOSIS OF RED EYES

- Allergic conjunctivitis: History of allergy or atopy is usual as is itching, watery discharge and recurrent episodes.
- Toxic conjunctivitis: History of application of eye medications causing chemical irritation.
- Episcleritis: History of dry eye is common. Eye involvement may be sectorial.
- Scleritis: Pain is deep and severe. Sclera may have bluish hue under natural light.

- Iritis: Circumciliary injection, hazy anterior chamber, pupil distorted and decreased vision.
- Acute glaucoma: Hazy cornea, mid-dilated pupil, decreased vision, severe eye pain, headache, nausea and vomiting.

CONTROL MEASURES

Intensive surveillance requires to be maintained during outbreaks in view of high infectivity, short incubation period and greater transmission risk. Cluster of cases of conjunctivitis should prompt preliminary notification via SMS to the National CPRC, MOH (010-8608949) and input into e-Wabak within 24 hours.

Bacterial and viral conjunctivitis can spread easily from one person to another by having contact with the discharge from the eye or upper respiratory tract (nose or mouth) of an infected person, by contaminated hands, clothing or other articles. As such, the following measures should be practiced in the event of a conjunctivitis outbreak:

- Meticulous hand washing and cleaning under the nails is very important.
- Isolate suspected cases of conjunctivitis as able.
- Educate cases and their contacts about:
- Minimizing hand-to-eye contact and to thoroughly wash hands after medication administration onto the eyes.
- Avoidance of sharing personal items especially face cloths, towels and pillow cases, including eye makeup applicators.
- The need to discontinue the use of contact lens until symptom-free.
- Cases with bacterial or viral conjunctivitis will be excluded from school or work.
- Cases with bacterial conjunctivitis may return to school / work 24 hours after antibiotics initiated or as per advice by health care provider.
- Cases with viral conjunctivitis may return to school / work when eyes are 'clear', i.e. no apparent redness and no discharge present or as per advice by health care provider.

REFERENCE LABORATORY

National Public Health Laboratory (NPHL) Sungai Buloh, Selangor: For strain identification and epidemiological surveillance.

Contact Information

HIV/STI/Hepatitis C Sector
Disease Control Division
Ministry of Health

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DENGUE FEVER
DENGUE HAEMORRHAGIC FEVER
DENGUE SHOCK SYNDROME
(ICD 10: A90, A91)

Case Definition

Clinical case definition

Dengue Fever

Acute onset of high grade fever of usually 2-5 days or more associated with two or more of the following: headache, retro-orbital pain, myalgia, arthralgia, rash and mild haemorrhagic manifestation (epistaxis, gums bleeding and petechiae).

Dengue Haemorrhagic Fever

A probable or confirmed case of Dengue Fever with haemorrhagic tendencies evidenced by one or more of the following:

- Positive tourniquet test (may be absent in pre-shock or shock state)
- Petechiae, ecchymoses or purpura
- Bleeding: mucosa, gastrointestinal tract (hematemesis, melena), injection sites and
- Thrombocytopenia (100,000 cells per mm^3 or less)
- Evidence of plasma leakage due to increased vascular permeability:
- Rise in haematocrit: $\geq$ 20% above baseline.
- Signs of plasma leakage (pleural effusion and ascites, and /or hypoproteinaemia).

Dengue Shock Syndrome

All the above criteria, plus evidence of circulatory failure manifested by rapid and weak pulse, and narrow pulse pressure ($\leq$ 20 mm Hg) or hypotension for age, cold, clammy skin and altered mental status.

Clinical case definition (Based on warning signs)

Dengue without Warning Signs

Fever and two of the following:

- Nausea, vomiting
- Rash
- Aches and pains
- Leukopenia
- Positive tourniquet test

Dengue with Warning Signs

Dengue as defined above with any of the following:

- Abdominal pain or tenderness
- Persistent vomiting
- Clinical fluid accumulation (ascites, pleural effusion)
- Mucosal bleeding

- Lethargy, restlessness
- Liver enlargement >2 cm
- Laboratory: increase in HCT concurrent with rapid decrease in platelet count

Severe Dengue

Dengue with at least one of the following criteria:

- Severe Plasma Leakage leading to:
- Shock (DSS)
- Fluid accumulation with respiratory distress
- Severe bleeding as evaluated by clinician
- Severe organ involvement
- Liver: AST or ALT ≥ 1000
- NS: impaired consciousness
- Failure of heart and other organs

Laboratory criteria (any of the following)

- Detection of Dengue Non-Structural Protein 1 (NS1) from serum.
- Dengue IgM seroconversion in paired sera.
- Dengue IgG seroconversion in paired sera or fourfold or greater rise dengue IgG in paired sera.
- Detection of dengue virus genome in serum or CSF or biopsy samples by polymerase chain reaction (PCR).
- Isolation of the dengue virus from serum, plasma, leukocytes, or biopsy samples.
- Demonstration of dengue virus antigen in tissue biopsy by immunohistochemistry or immunofluorescence.
- Detection of dengue IgM and/or IgG from in a single serum sample (highly suggestive).

Case Classification

Suspected

A case compatible with clinical description.

Confirmed

A case compatible with the clinical description and laboratory confirmed.
Ideally paired serum samples are required after an interval of 10-14 days apart. If the first sample is negative, a second sample should be obtained.

Types of Surveillance

Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988.

When to notify

All suspected dengue fever or dengue haemorrhagic fever cases should be notified.

How to notify

A suspected dengue fever or dengue haemorrhagic fever case should be notified by phone to the nearest District Health Office within 24 hours of diagnosis. It is then followed by submission of the notification form. Any change of diagnosis from DF to DHF should be re-notified.

Special Aspects

Any available laboratory result later than the notification should be informed to the District Health Office.

References Laboratory

NPHL: For viral strain identification for surveillance purposes.

Contact Information

Vector Borne Disease Sector
Disease Control Division
Ministry of Health

Tel: 03 - 8883 4276
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DIPHTHERIA
(ICD 10: A 36)

Case Definition

Clinical case definition

An illness of the upper respiratory tract characterized by laryngitis or pharyngitis or tonsillitis AND an adherent membrane (pseudo-membrane) of the tonsils, pharynx and/or nose.

Laboratory criteria for diagnosis

Isolation of toxigenic *Corynebacterium diphtheriae* from a clinical specimen. Detection of toxigenicity is via Elek test or PCR.

Case Classification

Suspected

A clinically compatible case that is not laboratory confirmed and is not epidemiologically linked to a laboratory confirmed case.

Confirmed

A clinically compatible case that is either laboratory confirmed or epidemiologically linked to a laboratory confirmed case.

Types of Surveillance

Mandatory notification under the Prevention and Control of Infectious Disease Act 1988.

When to notify

Any suspected diphtheria case should be notified and investigated. However, only clinically compatible case with positive toxigenic Corynebacterium diphtheriae case should be registered. Person with positive laboratory result but do not meet the clinical description (asymptomatic carriers) should not be registered.

How to notify

A diphtheria case should be notified by phone to the nearest District Health Office within 24 hours of diagnosis.

Outbreak situations

Intensive surveillance to be maintained during outbreaks in view of high infectivity, greater transmission risk and increased mortality.

Special Aspects

Nil.

References Lab

IMR, NPHL.

Contact Information

VPD & FWBD Sector	Tel: 03 – 8883 4421 / 4504
Disease Control Division	Fax: 03 – 8888 6270
Ministry of Health	E-mail: cprc@moh.gov.my

DYSENTERY
(ICD 10: A 09)

Case Definition

Clinical case definition
Acute diarrhoea with blood in the stool.

Laboratory criteria for diagnosis
Stool examination is necessary to confirm dysentery. Stool culture for pathogen causing dysentery, such as *Shigella dysenteriae, E. Coli O157, Entamoeba histolytica, Campylobacter sp, Yersinia enterocolitica* or others should be positive isolation to confirm the diagnosis.

Case Classification

Suspected
A case with bloody diarrhoea that is not laboratory confirmed.

Confirmed
A clinical case that is laboratory confirmed for a pathogen causing dysentery.

Types of Surveillance
Mandatory notification under the Prevention and Control of Infectious Disease Act 1988.

When to notify
All suspected and confirmed dysentery cases should be notified within 7 days of diagnosis. Only cases with isolation of dysenteric pathogen should be registered.

How to notify
A dysentery case should be notified to the nearest District Health Office.

Special Aspects
Nil.

Reference lab
NPHL, IMR.

Contact Information

VPD & FWBD Sector
Disease Control Division
Ministry of Health

Tel: 03 – 8883 4421 / 4503
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EBOLA VIRAL DISEASES (EVD) (ICD 10: A 98.4)

Case Definition

Clinical Case Definition

Severe acute viral illnesses, usually with sudden onset of fever, malaise, myalgia and headache, followed by pharyngitis, vomiting, diarrhoea and maculopapular rash. The accompanying haemorrhagic diathesis is often accompanied by hepatic damage, renal failure, CNS involvement and terminal shock with multi-organ dysfunction.

Lymphopenia, severe thrombocytopenia and transaminases elevation (AST greater than ALT), sometimes with hyperamylasemia. The average EVD case fatality rate is around 50%. Case fatality rates of Ebola infections in Africa have varied from 25% to 90% in past outbreaks.

Laboratory Criteria for Diagnosis

Supportive

Positive serology (ELISA for IgG and/or IgM); or

Confirmatory

Positive virus isolation (in laboratory of biosafety level 4); or
Positive skin biopsy (immunohistochemistry); or
Positive reverse transcriptase polymerase chain reaction (RT-PCR) assay.

Samples from patients are an extreme biohazard risk; laboratory testing on non-inactivated samples should be conducted under maximum biological containment conditions.

Case Classification

Suspected case or also known as the Person Under Investigation (PUI) for EVD

A person who has both consistent signs or symptoms and risk factors as follows should be considered a PUI for EVD:

a. Elevated body temperature or subjective fever or symptoms, including severe headache, fatigue, muscle pain, vomiting, diarrhoea, abdominal pain or unexplained haemorrhage; and

b. An epidemiological risk factor1 within the 21 days before the onset of symptoms.

[1] Epidemiologic Risk Factors to Consider When Evaluating a Person for Exposure to Ebola Virus:

A. High Risk includes any of the following:

In any country:*

- *Percutaneous (e.g. needle stick) or mucous membrane exposure to blood or body fluids (including but not limited to faeces, saliva, seat, urine, vomit and semen) from a person with Ebola who has symptoms. Ebola virus can be detected in semen for months after recovery from the disease. Unprotected contact with the semen of a person who has recently recovered from Ebola may constitute a potential risk for exposure. The period of risk is not yet defined;*
- *Direct contact with a person with Ebola who has symptoms or the person's body fluids, while not wearing appropriate personal protective equipment;*
- *Processing blood or body fluids from a person with Ebola who has symptoms, while not wearing appropriate PPE or without using standard biosafety precautions;*
- *Providing direct care to a person showing symptoms of Ebola in a household setting.*

In countries with widespread transmission or cases in urban settings with uncertain control measures:*

- *Direct contact with a dead body while not wearing appropriate PPE.*

B. ***Some Risk*** *includes any of the following:*

In any country:*

- *Being in close contact with a person with Ebola who has symptoms while not wearing appropriate PPE. Close contact is defined as being within approximately 1 metre of a person with Ebola while the person was symptomatic for a prolonged period of time while not using appropriate PPE.*

In countries with widespread transmission:*

- *Being in close contact with a person with Ebola who has symptoms, while not wearing appropriate PPE;*
- *Being in the patient-care area of an Ebola treatment unit;*
- *Providing any direct patient care in non-Ebola healthcare settings.*

C. ***Low (But Not Zero) Risk*** *includes any of the following:*

In any country:*

- *Brief direct contact (such as shaking hands) with a person in the early stages of Ebola, while not wearing appropriate PPE. Early signs can include fever, fatigue or headache;*
- *Brief proximity with a person with Ebola who has symptoms (such as being in the same room, but not in close contact) while not wearing appropriate PPE;*
- *Processing blood or body fluids from a person with Ebola who has symptoms, while wearing appropriate PPE or without using standard biosafety precautions;*
- *Travelling on an airplane with a person with Ebola who has symptoms and having had no identified some or high risk exposure.*

In countries with widespread transmission, cases in urban settings with uncertain control measures, of former widespread transmission and current established control measures:*

- *Having been in one of these countries and having had no known exposures.*

In any country other than those with widespread transmission:*

- *Brief direct contact (such as shaking hands) with a person in the early stages of Ebola, while not wearing appropriate PPE. Early signs can include fever, fatigue or headache;*
- *Brief proximity with a person with Ebola who has symptoms (such as being in the same room,*

but not in close contact) while not wearing appropriate PPE;

D. ***No Identifiable Risk*** *includes any of the following:*

- *Processing of Ebola-containing specimens in a Biosafety Level 4 facility;*
- *Any contact with a person who isn't showing symptoms of Ebola, even if the person had potential exposure to Ebola virus;*
- *Contact with a person with Ebola before the person developed symptoms;*
- *Any potential exposure to Ebola virus that occurred more than 21 days previously;*
- *Having been in a country with Ebola cases, but without widespread transmission, cases in urban settings with uncertain control measures, or former widespread transmission and now established control measures, and not having had any other exposures;*
- *Having stayed on or very close to an airplane or ship (for example, to inspect the outside of the ship or plane or to load or unload supplies) during the entire time that the airplane or ship was in a country with widespread transmission or a country with cases in urban settings with uncertain control measures, and having had no direct contact with anyone from the community;*
- *Having had laboratory-confirmed Ebola and subsequently been determined by public health authorities to no longer be infectious (i.e. Ebola survivors).*

** CDC Classification of Countries with Reported Ebola Cases:*

Widespread transmission	***Affected areas***
No countries currently in this classification	*None*

Countries with former widespread transmission and current, established control measures[2]	***Affected areas***
Liberia	*Entire country*
Sierra Leone	*Entire country*
Guinea	*Entire country*

Cases in urban settings with uncertain control measures[3]	***Affected areas***
No countries currently in this classification	*None*

Cases in urban settings with effective control measures	***Affected areas***
No countries currently in this classification	*None*

Previously affected countries4	***Affected areas***
Nigeria	*Lagos, Port Harcourt*
Senegal	*Dakar*
Spain	*Madrid*
United States	*Dallas, New York City*
Mali	*Bamako*
United Kingdom	*Scotland, England*
Italy	*Sardinia*

[2] *This category also includes countries that have experienced widespread transmission but are transitioning to being declared free of Ebola. The World Health Organization (WHO) is responsible for determining when a country will be declared free of Ebola virus transmission.*

[3] *Transmission in urban areas indicates the potential for spread through international air travel. Control measures in these countries are considered to be uncertain because of the inability of public health authorities to identify, locate or monitor a large proportion of potential contacts. People arriving from these countries should be screened upon entry.*

[4] *In these countries, which previously had locally acquired or imported Ebola cases, at least 42 days (two incubation periods) have elapsed since the last day that any person in the country had contact with a person with confirmed Ebola.*

Confirmed Case of EVD

A case with laboratory-confirmed diagnostic evidence of Ebola virus infection.

Types of Surveillance

Mandatory National Notification of Infectious Disease under the Infectious Disease Prevention and Control Act 1988.

When to notify

All PUI for EVD should be notified.

How to notify

A PUI for EVD should be notified by submission of the notification form to the following simultaneously, i.e. within 24 hours of the preliminary diagnosis:

a) The National CPRC, Disease Control Division, and
b) The respective State Health Department; and
c) The respective District Health Office.

Outbreak Situation

- Intensified surveillance and active finding of all the contacts for immediate isolation. Upon which, they will be placed at home or a designated premise under the order for supervision and observation.
- The contacts should be monitored for the duration of 42 days, i.e. from the date of the last person confirmed to have EVD tested negative for the second time.

Special Aspects

Extreme biohazard (BSL4) risk is associated with sampling, transportation and laboratory investigation, strict application of biosafety procedures and appropriate isolation of patients are essential.

Reference lab

To consult with:

- The Institute of Medical Research (IMR)
- The National Public Health Laboratory (NPHL), Sungai Buloh, Selangor

Other References Laboratory

CDC Laboratory Atlanta, USA

References

- Directive from the Deputy Director General of Health (Public Health) MOH Malaysia; ref. KKM.600/29/4/134(14) dated 3 February 2016

- Directive from the Director General of Health Malaysia; ref. (8) dlm.KKM-171/BKP/16/72/1071 Jld. 3 dated 19 January 2015

- Directive from the Director General of Health Malaysia; ref. (19) dlm.KKM-171/BKP/16/72/1071 dated 29 September 2014

- WHO Global Alert and Response (GAR), Ebola Virus Disease (http://www.who.int/csr/disease/ebola/en/)

- US Centres for Disease Control and Prevention, Ebola Virus Disease (http://www.cdc.gov/vhf/ebola/)

- Case Definitions for Infectious Diseases in Malaysia, 2nd Edition, MOH Malaysia, 2006

- Control of Communicable Diseases Manual, 17th Edition, American Public Health Association, 2000

Contact Information

Surveillance Sector
Disease Control Division
Ministry Of Health

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FOOD POISONING (ICD 10: A 05.9)

Case Definition

Clinical Case Definition

Acute onset of vomiting and / or diarrhoea and / or other acute symptoms associated with ingestion of food (include drinks).

Food poisoning may also present with neurological symptoms such as paresthaesias, muscle weakness and paralysis.

Laboratory Criteria for Diagnosis

Isolation of pathogen or its toxin or identification of non-microbiological agent from clinical specimens.

Case Classification

Suspected: Not applicable.

Confirmed: Any case notified that fulfilled the clinical case definition of food poisoning is considered confirmed case.

Types of Surveillance

Mandatory notification under the Prevention and Control of Infectious Disease Act 1988.

When to notify

All food poisoning cases should be notified within 24 hours of diagnosis. Laboratory confirmation is NOT required for notification.

How to notify

A food poisoning case or episode should be notified to the nearest District Health Office.

Special Aspects

In an episode of food poisoning, clinical specimens should be taken from 10% of cases or 10 cases, whichever is lesser. The suspected food should be sent for analysis for suspected microbial pathogen/toxin or hazard. If non-microbial agent is suspected e.g. in chemical poisoning, gastric lavage specimen, vomitus and/or blood and/or urine should be sent for analysis.

Reference Lab

MR / NPHL: Microbial Strain / etiologic agent identification for further investigation and surveillance purposes together with the relevant food analyses.

National Poison Centre, USM, Penang: for chemical and toxin poisoning.

Chemistry Department: for chemical poisoning.

Contact Information

VPD & FWBD Sector
Disease Control Division
Ministry of Health

Tel: 03 – 8883 4421 / 4503
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E-mail: cprc@moh.gov.my

GONOCOCCAL INFECTIONS (ICD 10: A 54.9)

Case Definition

Clinical case definition

A sexually transmitted infection commonly manifested by urethritis, cervicitis, or salphingitis. Infection may be asymptomatic.

Laboratory criteria for diagnosis

- isolation of N. gonorrhoeae from a clinical specimen or
- observation of Gram –ve intracellular diplococci in a urethral smear obtained from a male.

Case Classification

Confirmed

A case that is laboratory confirmed.

Types of Surveillance

Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988.

When to notify

Only confirmed cases should be notified.

How to notify

A gonorrhoea case should be notified by phone to the nearest District Health Office within 24 hours of diagnosis. It is then followed by submission of the notification form.

Special Aspects

Nil.

References Laboratory

NPHL: Sentinel surveillance for anti-microbial drug resistance.

Contact Information

HIV/STI/Hepatitis C Sector
Disease Control Division
Ministry of Health

Tel: 03-8883 4262
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E-mail: cprc@moh.gov.my

HAEMOPHILUS INFLUENZAE DISEASE (ICD 10: G00.0)

Case Definition

Clinical case definition

Invasive disease caused by ***Haemophilus influenzae type b*** (Hib) may produce any of several clinical syndromes, including meningitis (G00.0), bacteraemia (A41.3), epiglottitis (J05), or pneumonia (J14).

Laboratory criteria for diagnosis

Isolation of H. *influenzae type b* from a normally sterile site (e.g., blood or cerebrospinal fluid [CSF] or, less commonly, joint, pleural, or pericardial fluid).

Case Classification

Probable

A clinically compatible case with detection of *H. influenzae type b* antigen in CSF.

Confirmed

A case that is laboratory confirmed (growth or identification of Hib in CSF or blood).

Notes: Positive antigen test results from urine or serum samples are unreliable for diagnosis of *H. influenzae type b* disease. Any person with Hib isolated in CSF or blood may be reported as a confirmed case, regardless of whether their clinical syndrome was meningitis

Type of Surveillance

National Laboratory Based Surveillance. PD206 under Health Management Information System (HMIS).

Special Aspects

Nil.

Reference Laboratory

IMR.

Contact Information

VPD & FWBD Sector
Disease Control Division
Ministry of Health

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HAND, FOOT AND MOUTH DISEASE (HFMD) (ICD 10: B08.4)

Case Definition

Clinical case definition

Clinical case definition of HFMD:
Any child (10 year-old and below) with:

- mouth / tongue ulcer and
- maculopapular rashes and / or vesicles on palms and soles
- with or without history of fever

Laboratory criteria for diagnosis

Any case that has clinical symptom and positive for virus (Coxsackieviruses (CV) A16, A5, A9, A10, B2, B5; and Enterovirus 71 and other enteroviruses) which could cause HFMD, isolated or detected from stool or vesicle fluid or mouth ulcer or saliva.

N.B.: Laboratory confirmation is NOT required for notification.

Case Classification

Suspected

A case that meets the clinical case definition.

Confirmed

A suspected case in which laboratory investigation confirms the presence of virus OR when cases are epidemiologically linked to a laboratory confirmed case.

All suspected and confirmed case need to be notified to nearest District Health Office within 24 hours of diagnosis.

Types of Surveillance

Mandatory Surveillance.

When to notify

All suspected and confirmed case need to be notified to nearest District Health Office within 24 hours of diagnosis.

How to notify

Notification by notification form or CDCIS e-Notification system.

Outbreak situations

The occurrence of two or more cases in the same locality within the incubation period (6 days).

Special Aspects

From September 2012, MOH focus on 9 states in Malaysia with high burden of HFMD cases for laboratory surveillance. There are 19 sentinel sites identified. Each of the sentinels has to send 5 samples per month to National Public Health Laboratory (NPHL). For outbreak, 10% of the cases (but not more than 5 samples for each outbreak) that meet the clinical criteria of HFMD from a cluster / outbreak can send the sample for laboratory testing if no laboratory confirmation of the causative agent done in the same locality.

Reference Laboratory

National Public Health Laboratory (NPHL).

References

- Hand, Foot and Mouth Disease (HFMD) Guidelines (2007), Ministry of Health Malaysia.
- *"Pelan Tindakan Bersepadu bagi mencegah dan mengawal Kejadian Penyakit Tangan, Kaki dan Mulut* (HFMD) (Julai 2006)".

Contact Information

Zoonosis Sector
Disease Control Division
Ministry of Health

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HEPATITIS A (ICD 10: B15.9)

Case Definition

Clinical case definition

Acute illness typically including fever, malaise, extreme fatigue, anorexia, nausea, acute jaundice and right upper quadrant tenderness with raised alanine aminotransferase greater than 2.5 times of normal level.

Laboratory criteria for diagnosis

Laboratory diagnosis is confirmed in any of the following;

- Positive IgM antibody to Hepatitis A virus (anti-HAV IgM).
- Detection of virus RNA and/or antigen in faeces/blood.

Case Classification

Suspected

A case that is compatible with clinical description.

Confirmed

A suspected case that is laboratory confirmed.

Types of Surveillance

Mandatory notification under the Prevention and Control of Infectious Diseases Act 1988.

When to notify

All confirmed cases should be notified within 7 days of diagnosis.

How to notify

A case should be notified to the nearest District Health Office.

Outbreak situations

All outbreaks should be investigated immediately and blood samples should be taken from 10 suspected cases or 10% of the cases, whichever is lesser to confirm the diagnosis.

Special Aspects

Nil.

Reference laboratory

IMR – For sero-prevalence and confirmation.

Contact Information

VPD & FWBD Sector
Disease Control Division
Ministry of Health

Tel: 03 – 8883 4421 / 4503
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E-mail: cprc@moh.gov.my

HEPATITIS B
(ICD 10: B 16.9)

Case Definition

Clinical case definition

- Acute illness typically including acute jaundice, dark urine, anorexia, malaise, extreme fatigue, and right upper quadrant tenderness with raised alanine aminotransferase more than 2.5 times normal.
- Chronic infection may be asymptomatic or symptomatic

Laboratory criteria for diagnosis

Acute: HBsAg and/or IgM anti-HB core (IgM anti-HBc) positive.
Chronic: HBsAg positive > 6months.

Case Classification

Suspected

A case that is compatible with clinical description.

Confirmed

A case that is compatible with clinical description that is laboratory confirmed.

Types of Surveillance

Mandatory notification under the Prevention and Control for Infectious Disease Act 1988.

When to notify

All confirmed acute and chronic cases should be notified within 7 days of diagnosis.

How to notify

A case should be notified to the nearest District Health Office.

Outbreak situations

All outbreaks should be investigated immediately and confirmed serologically.

Special Aspects

Nil.

References Laboratory

IMR.

Contact Information

VPD & FWBD Sector
Disease Control Division
Ministry of Health

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HEPATITIS C
(ICD 10: B 17.0)

Case Definition

Clinical case definition

- Acute illness typically including acute jaundice, dark urine, anorexia, malaise, extreme fatigue and right upper quadrant tenderness. Biological signs include increased urine urobilinogen and more than 2.5 times the upper limit of serum alanine aminotransferase (ALT).
- Chronic infection may be asymptomatic or symptomatic.

Laboratory criteria for diagnosis

Acute: Anti-HCV positive, detectable HCV RNA and elevated ALT.
Chronic: Detectable HCV RNA > 6 months.

Case Classification

Suspected
A case that is compatible with the clinical description.
Confirmed
A suspected case that is laboratory confirmed.

Types of Surveillance
Mandatory notification under the Prevention and Control of Infectious Disease Act 1988.
When to notify
All confirmed acute and chronic cases should be notified.
How to notify
A case should be notified to the nearest District Health Office within 7 days of diagnosis.
Outbreak situations
All outbreaks should be investigated immediately and confirmed by laboratory tests.

Special Aspects
Nil.

References Laboratory
IMR – For sero-prevalence and confirmation of Hepatitis C.

Contact Information

AIDS/STI Section
Disease Control Division
Ministry of Health

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ACUTE VIRAL HEPATITIS
(ICD 10: B17.1 (Hepatitis D), B 17.2 (Hepatitis E))

Case Definition

Clinical case definition

Acute illness typically including acute jaundice, dark urine, anorexia, malaise, extreme fatigue and right upper quadrant tenderness. Biological signs include increased urine urobilinogen and more than 2.5 times the upper limit of serum alanine aminotransferase (ALT).

Laboratory criteria for diagnosis

Hepatitis Non A & B: - IgM anti-HAV, IgM anti-HBc (or HBs Ag) and anti-HCV negative.

Hepatitis D: - HBs Ag positive or IgM anti-HBc positive + anti-HDV or HDV Ag or HDV RNA positive [only as co-infection (IgM anti-HBc positive) or superinfection of Hepatitis B IgM anti-HBc negative)].

Hepatitis E: - IgM anti- HEV or HEV RNA positive;

OR

any other common cause of viral hepatitis when tested positive.

Case Classification

Suspected

A case that is compatible with the clinical description.

Confirmed

A laboratory confirmed case.

Types of Surveillance

Mandatory notification under the Prevention and Control of Infectious Disease Act 1988.

When to notify

All confirmed acute cases should be notified.

How to notify

A case should be notified to the nearest District Health Office within 7 days of diagnosis.

Outbreak situations

All outbreaks should be investigated immediately and confirmed serologically.

Special Aspects

Nil.

References Laboratory

IMR – For sero-prevalence study.

Contact Information

VPD & FWBD Sector	Tel: 03 – 8883 4421 / 4504
Disease Control Division	Fax: 03 – 8888 6270
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HIV INFECTION (ICD 10: B24)

Case Definition

1. **In adults, adolescents or children aged ≥ 18 months, a reportable case of HIV infection must meet at least one of the following criteria:**

   a. Laboratory criteria

   Detection of antibody to HIV virus
   Reactive result on a screening test for HIV antibody (rapid or laboratory-based enzyme immunoassay), and followed by a positive result on a confirmatory test for HIV antibody (rapid or laboratory-based enzyme immunoassay) relying on different antigens or different operating characteristics.

   Detection of HIV virus (viral antigen)
   Positive result or report of detectable quantity on any of the following HIV virology (non-antibody) tests:
   - HIV nucleic acid (DNA or RNA) detection.
   - HIV p24 antigen test including neutralization assay,
   - HIV isolation (viral culture)

   b. Clinical or other criteria (if the above laboratory criteria are not met)
   Conditions that meets the criteria included in the case definition for AIDS.

2. **In a child aged < 18 months, a reportable case of HIV infection must meet at least one of the following criteria**

   a. Laboratory criteria

   Definitive
   Positive result or report of detectable quantity on any of the following HIV virology (non-antibody) tests:
   - HIV nucleic acid (DNA or RNA) detection
   - HIV p24 antigen test including neutralization assay
   - HIV isolation (viral culture)

   confirmed by a second virological test obtained from a separate determination taken more than six weeks after birth.

   OR

   Presumptive
   A child who does not meet the criteria for definitive HIV infection but who has a positive result on only one specimen (excluding cord blood) using the above HIV virology (non-antibody) tests.

Case Classification

Not applicable.

Types of Surveillance

Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988.

When to notify

All positive HIV cases should be notified; inclusive cases detected through screening activities.

How to notify

HIV cases should be notified within a week (7 days) to the nearest District Health Office through submission of the notification form.

Contact Information

HIV/STI/Hepatitis C Sector
Disease Control Division
Ministry of Health

Tel: 03-8883 4262
Fax: 03-8883 4285
E-mail: cprc@moh.gov.my

INFLUENZA-LIKE ILLNESS (ILI)

Case Definition

Surveillance case definition

An acute respiratory infection with:

- measured fever of ≥ 38°C;
- and cough;
- with onset within the last 10 days

Laboratory criteria for diagnosis

Isolation of influenza virus via available tests; which include RT-PCR, viral culture, rapid diagnostic (antigen) testing, immunofluorescence assays and serology

Case Classification

Suspected

A case that meets the surveillance case definition.

Confirmed

A suspected case in which laboratory investigation confirms the presence of influenza virus in a clinical specimen.

Laboratory confirmation is not required for management of patient and compiling of ILI surveillance data.

Types of Surveillance

National Sentinel Surveillance of Influenza-Like Illness (ILI) and Severe Acute Respiratory Infection (SARI).

Reference Laboratory

The National Influenza Centre (NIC):

- The Institute of Medical Research (IMR).
- The University Malaya Medical Centre.

The National Influenza Laboratory (NIL):

- The National Public Health Laboratory (NPHL), Sungai Buloh, Selangor.

References

- Malaysia Influenza Surveillance Protocol, MOH Malaysia, 2015
- Global Epidemiological Surveillance Standards for Influenza, WHO, 2013
- Case Definitions for Infectious Diseases in Malaysia, 2nd Edition, MOH Malaysia, 2006

Contact Information

The National Influenza Surveillance Coordinator
Disease Surveillance Section
Disease Control Division
Ministry of Health

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JAPANESE ENCEPHALITIS (ICD 10: A83.0)

Case Definition

Clinical case definition

A febrile illness of variable severity associated with neurological symptoms ranging from headache to meningitis or encephalitis. Symptoms can include: headache, fever, meningeal signs, stupor, disorientation, coma, tremors, paresis (generalized), hypertonia, loss of coordination.

Laboratory criteria for diagnosis

Presumptive: Detection of IgM antibody to the virus in single serum sample and no history of recent JE vaccination; and negative for dengue virus infection.

Confirmatory:

- JE virus-specific IgM in the CSF, or
- Four fold or greater rise in the JE virus-specific antibody in paired sera (acute and convalescent phases) ELISA, haemagglutination inhibition test or virus neutralization test, in a patient with no history of recent JE/yellow fever/TBE vaccination and where cross-reactions to other flaviviruses have been excluded.
- Detection of the JE virus, antigen or genome in tissue, blood or other body fluid by immunochemistry or immunofluorescence or PCR.

Case Classification

Suspected

A case that is compatible with the clinical description.

Probable

A suspected case with presumptive laboratory results.

Confirmed

A suspected case with confirmatory laboratory results.

(Note: JE infections are common and the majority is asymptomatic. JE infections may occur concurrently with other infections causing central nervous system symptoms, and serological evidence of recent JE viral infection may not be correct in indicating JE to be the cause of the illness. A suspected case without a confirmatory laboratory results for JE will be notified as viral encephalitis clinically).

Types of Surveillance

Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988.

When to notify
All confirmed cases should be notified.

How to notify
A case should be notified to the nearest District Health Office by submission of the notification form.

Special Aspects
Nil.

References Laboratory
IMR – For sero-prevalence study.

Collaboration with VRI and Veterinary Department, Ministry of Agriculture

Contact Information

Vector Borne Disease Sector
Disease Control Division
Ministry of Health

Tel: 03 - 8883 4276
Fax: 03 – 8888 6251 / 6215
E-mail: cprc@moh.gov.my

LEPROSY (HANSEN'S DISEASE) (ICD 10: A 30)

Case Definition

Clinical case definition:

Patients should be suspected of having leprosy if 1 or more of the following symptoms and signs are present;

a. Skin lesion - one or more hypopigmented or erythematous skin lesion(s) with a definite loss of sensation.
b. Neurological involvement - thickening and/or tenderness of ≥1peripheral nerve(s) with or without signs of nerve damage.
c. Presence of acid-fast bacilli in the Slit Skin Smear (SSS) or skin biopsy.

Laboratory criteria for diagnosis:

Laboratory confirmatory tests for leprosy include;

a. **Slit Skin Smear (SSS)** - must be done to all cases to confirm the diagnosis before treatment started. The presence of AFB in Slit Skin Smear (SSS) confirms the diagnosis of leprosy (Multibacillary), but a negative result does not rule out leprosy. Slit Skin Smear is also important for disease classification, to know infectivity status of a case and to assess the effectiveness of the treatment given.

b. **Biopsy of a skin lesion -** should be done to all cases to confirm the diagnosis. In condition whereby Slit Skin Smear (SSS) is negative, result of skin biopsy is very helpful in deciding whether it is leprosy (Paucibacillary) or not leprosy.

c. **Polymerase Chain Reaction (PCR)** - PCR had higher sensitivity compared with SSS, especially in diagnostically challenging and PB cases. Currently PCR is only available at the National Public Health Laboratory, Sungai Buloh and is done upon request from a dermatologist.

Case Classification

There are two classification systems used in leprosy:

A. WHO classification (Multibacillary or Paucibacillary leprosy)

This classification is a must to assign the correct WHO recommended Multidrug Therapy regimens. They are grouped into either Paucibacillary or Multibacillary types of leprosy, based on the number of skin lesions and bacteriological status. The disease must be

- Paucibacillary (PB) leprosy, negative smears at all sites, single or only a few hypo pigmented and hypoaesthetic skin lesions (< 6)

- Multibacillary (MB) leprosy - either positive smears at any site, or multiple (≥ 6) hypo pigmented, hypo anaesthetic or erythematous skin lesions (sometimes poorly

defined). Lesions may also be macules, papules or nodules.

B. The Ridley-Jopling classification (Tuberculoid – Lepromatous)

After exposure to leprosy and the incubation period, leprosy may fluctuate between various stages depending on the individual's cell-mediated immune response or in response to therapy.

Transition toward the tuberculoid leprosy (TT) end of the spectrum is referred to as upgrading (and may lead to a reversal or type I reaction) and transition toward the lepromatous leprosy (LL) pole as downgrading

- Indeterminate stage - single skin lesion, frequently heals spontaneously
- Tuberculoid leprosy (TT) - few skin lesions
- Borderline tuberculoid leprosy (BT)
- Borderline leprosy (BB)
- Borderline lepromatous leprosy (BL)
- Lepromatous leprosy (LL) - most severe stage, diffuse skin lesions and high bacterial load.

Types of Surveillance

Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988.

When to notify

Notification should be done once the diagnosis is confirmed by laboratory test or expert clinical decision by dermatologist.

How to notify

A leprosy case should be notified to the nearest District Health Office by submission of the notification form within 7 days from date of confirmed diagnosis.

Special Aspects

Nil

References Laboratory

National Public Health Laboratory (NPHL): For bacterial identification, pattern of drug resistance and External Quality Control of Slit Skin Smear.

Contact Information

TB/Leprosy Sector	Tel: 03 – 8883 4507
Disease Control Division	Fax: 03 – 8888 6270
Ministry of Health	E-mail: cprc@moh.gov.my

LEPTOSPIROSIS (ICD 10: A27)

Case Definition

Clinical case definition

A case that is compatible with the following clinical description:

Acute febrile illness with history of exposure to water and/or environment possibly contaminated with infected animal urine with ANY of the following symptoms:

- Headache
- Myalgia particularly associated with the calf muscles and lumbar region
- Arthralgia
- Conjunctival suffusion
- Meningeal irritation
- Anuria or oliguria and/or proteinuria
- Jaundice
- Haemorrhages (from the intestines and lungs)
- Cardiac arrhythmia or failure
- Skin rash
- Gastrointestinal symptoms such as nausea, vomiting, abdominal pain, diarrhoea.

Laboratory criteria for diagnosis

Laboratory result is required for notification.

Case Classification

Clinical

A case that is compatible with the clinical description as above.

Probable

A clinical case AND positive ELISA / other Rapid tests.

Confirmed

A confirmed case of leptospirosis is a clinical OR probable case with any one of the following laboratory tests:

- Microscopic Agglutination Test (MAT), for single serum specimen - titre ≥ 1:400; for paired sera - four fold or greater rise in titre.
- Positive PCR (samples should be taken within 10 days of disease onset).
- Positive culture for pathogenic leptospires (blood samples should be taken within 7 days of onset and urine sample after the 10th day).
- Demonstration of leptospires in tissues using immunohistochemical staining (e.g. in post mortem cases).
- In places where the laboratory capacity is not well established, a case can be considered as confirmed if the result is positive by two (2) different rapid diagnostic tests.

Types of Surveillance
Mandatory Surveillance.

When to notify
Probable and confirmed cases to be notified within one week of diagnosis.

How to notify
Notification by notification form or registered under CDCIS eNotification system.

Outbreak situations
An outbreak is defined as more than one probable or confirmed cases of leptospirosis with an epidemiological link within one incubation period.

Special Aspects
All probable and confirmed cases must be notified to the nearest District Health Office within 1 week of the date of laboratory diagnosis.

Reference Laboratory
Institute of Medical Research (IMR).
National Public Health Laboratory (NPHL)

References
Guidelines for the Diagnosis, Management, Prevention and Control of Leptospirosis in Malaysia (2011).

Contact Information
Zoonosis Sector
Disease Control Division
Ministry of Health

Tel: 03-88834420
Fax: 03-88891013
Email : zoonosis@moh.gov.my

MALARIA
(ICD 10: B54)

Case Definition

Clinical case definition

Signs and symptoms are variable; most patients experience fever. In addition to fever, common associated symptoms include: headache, back pain, chills, sweating, myalgia, nausea, vomiting, diarrhoea and commonly associated signs of anaemia and/ or splenomegaly.

Untreated or complicated Malaria (P. falciparum infections) can lead to cerebral malaria and other neurological features like coma & generalized convulsions, renal failure, jaundice and hepatic dysfunction, pulmonary oedema, hypotension & circulatory collapse, normocytic anaemia & blackwater fever (haemoglobinaemia), hypoglycaemia, lactic acidosis, septicaemia, disseminated intravascular coagulation (DIVC), fluid and electrolyte imbalance, hyperparasitemia and death.

Asymptomatic parasitemia can occur among persons who have been long-term residents of areas in which malaria is hyper endemic.

Laboratory criteria for diagnosis

Several tests are available for laboratory diagnosis of malaria such as Blood Film for Malaria Parasite (BFMP), Polymerase Chain Reaction (PCR) and Rapid Diagnostic Test (RDT).

- Microscopic parasitic detection in peripheral blood film (Blood Film for Malaria Parasite -BFMP)
- Polymerase Chain Reaction (PCR)
- Rapid Diagnostic Test (RDT)

Note** Microscopic examination (BFMP) of both thick and thin film remains the gold standard for confirmation of malaria in Malaysia.

Case Classification

Confirmed asymptomatic malaria

A person with no symptoms and/or signs of malaria who shows laboratory confirmation of parasitemia.

Confirmed uncomplicated malaria

A patient with symptoms and/or signs of malaria without complication but with laboratory confirmation of diagnosis.

Confirmed severe or complicated malaria

A laboratory confirmed case of malaria presenting with one or more of its complication as listed above.

Types of Surveillance

Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988.

- Passive surveillance through routine notification by health facilities to the nearest district health office.
- Active surveillance amongst high risk groups in endemic areas like Orang Asli, land schemes settlers and migrant workers.

When to notify

Laboratory confirmed (Blood Film for Malaria Parasite -BFMP) cases should be notified.

How to notify

Malaria is a notifiable disease under the Communicable Diseases Control Act 1988 which mandates notification within 7 days. However, to ensure early investigation and institution of control measures, all practitioners are to notify malaria cases within 24 hours to the nearest health office.

How to notify

A case should be notified to the nearest District Health Office by submission of the notification form within 7 days from date of confirmed diagnosis.

Special Aspects

Nil.

Reference lab

NPHL /IMR: Identification of parasite strain and pattern of anti-malarial drug resistance.

Contact Information

Vector Borne Disease Sector
Disease Control Division
Ministry of Health

Tel: 03 - 8883 4276
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MEASLES
(ICD 10: B 05)

Case Definition

Clinical case definition

Any person with:

- Fever, **and**
- maculopapular (i.e. non-vesicular) rash **and**
- cough or coryza or conjunctivitis.

Laboratory criteria for diagnosis

- Presence of measles-specific IgM antibodies, or
- Presence of measles virus in clinical samples using culture techniques, or
- Presence of measles virus in clinical samples using molecular techniques.

Case Classification

Suspected

Any person diagnosed as measles by a clinician.

Confirmed

A case that is laboratory confirmed or that meets the clinical case definition and is epidemiologically linked to a laboratory-confirmed case.

Types of Surveillance

Mandatory notification under the Prevention and Control of Infectious Diseases Act 1988.

When to notify

All cases, suspect or confirmed should be notified within 24 hours of diagnosis.

How to notify

A case should be notified to the nearest District Health Office.

Outbreak situations

Intensive surveillance requires to be maintained during outbreaks in view of high infectivity, short incubation period, greater transmission risk and increased morbidity and mortality especially among under- five years of age.

In an outbreak, serum should be taken from 10% of cases or at least 10 cases, whichever is less. Clinical specimens for viral isolation and genotype identification are to be taken from some patients with clinical presentation. In the elimination phase, documentation on genotype is important as one of the criteria for verification.

Special Aspects

Measles is under the Measles Elimination Programme, in line with WHO WPR and WHO Geneva vision.

Reference laboratory

NPHL: Serology test, viral culture and genotyping test.

Contact Information

VPD & FWBD Sector
Disease Control Division
Ministry of Health

Tel: 03 – 8883 4421 / 4504
Fax: 03 – 8888 6270
E-mail: cprc@moh.gov.my

MELIOIDOSIS (ICD 10: A24)

Case Definition

Clinical case definition

Person having:
a. Fever and/or
b. Pneumonia and/or
c. Single or multiple abscesses and other evidence of infections.

AND predisposing factors especially diabetes mellitus
AND history of exposure to high risk activities/occupational hazards, such as agriculture, mining, construction, fresh-water recreation and camping.
Note: In children, predisposing factors may not be present.

Laboratory criteria for diagnosis

Laboratory confirmation is required for notification.
All confirmed cases should be notified to the nearest District Health Office within 1 week of the date of laboratory diagnosis.

Case Classification

Suspected case: Any case that is compatible with clinical case definition.

Probable Case: Any suspected case with IFAT IgM ≥1: 80.

Confirmed case: Any suspected case with positive culture for *Burkholderia pseudomallei* or positive PCR or a four-fold rise in serological titre.

Clinical

A case that is compatible with the clinical description.

Probable

A clinically compatible illness.

Types of Surveillance

When to notify

Within one (1) week of diagnosis.

How to notify

Notification by notification form.

Outbreak situations

An outbreak is defined as more than one confirmed case of melioidosis with an epidemiological link within the incubation period (21 days).

Special Aspects

All confirmed cases should be notified to the nearest District Health Office within one (1) week of the date of laboratory diagnosis.

Reference Laboratory

Institute of Medical Research (IMR).
National Public Health Laboratory (NPHL).

References

Guidelines for Clinical and Public Health Management of Melioidosis in Pahang (2011).

Contact Information

Zoonosis Sector
Disease Control Division
Ministry of Health

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MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS (MERS-CoV) (ICD 10: B 34.2)

Case Definition

Clinical case definition

Fever, cough and dyspnoea are the major presenting symptoms of patients admitted to hospital. Other common presenting symptoms include chills, rigor, headache, myalgia and malaise. Respiratory failure is the major complication. Mild disease and atypical presentation with diarrhoea have also been reported.

Laboratory criteria for diagnosis

To consider a case as laboratory-confirmed MERS-CoV infection, one of the following conditions must be met:

- A positive PCR result for at least two different specific targets on the MERS-CoV genome using a validated assay;

OR

- One positive PCR result for a specific target on the MERS-CoV genome and MERS-CoV sequence confirmation from a separate viral genomic target.

Case Classification

Suspected case: Suspected case or also known as the Patient Under Investigation (PUI) for MERS-CoV infection

a. A person with an acute respiratory infection, with history of fever and cough and indications of pulmonary parenchymal disease (e.g. pneumonia or ARDS), based on clinical or radiological evidence, who within 14 days before onset of symptoms has history of residing in / travel from the Middle East / other affected countries* with active transmission of MERS.

Note: Clinicians should be alert to the possibility of atypical presentations in patients who are immunocom promised.

** Countries in which there are reported active transmissions of MERS are updated on the WHO website http://www.who.int/emergencies/mers-cov/en/*

b. Individuals with acute respiratory illness of any degree of severity who within 14 days before onset of illness had any of the following exposures:

- close physical contact1 with a confirmed or probable case of MERS infection, while that patient was ill; or
- visiting / staying in a healthcare facility, where hospital associated MERS-CoV outbreak

have been reported; or

- direct contact with dromedary camels or consumption or exposure to dromedary camel products (raw meat, unpasteurized milk, urine) in countries where MERS is known to be circulating in dromedary camel populations or where human infections occurred as a result of presumed zoonotic transmission.

c. A person with an acute respiratory infection, with history of fever and cough and indications of pulmonary parenchymal disease (e.g. pneumonia or ARDS), based on clinical or radiological evidence, who requires admission to hospital, with no other aetiology that fully explains the clinical presentation and he / she is part of a cluster[2] of severe acute respiratory illness (e.g. fever, and pneumonia) of unknown aetiology in which MERS is being evaluated, in consultation with state and local health departments in Malaysia.

[1] Close physical contact is defined as:

- *Health care associated exposure, including providing direct care for MERS-CoV patients, working with health care workers infected with MERS-CoV, visiting patients or staying in the same close environment of a MERS-CoV patient while not wearing recommended personal protective equipment (i.e. gowns, gloves, respirator, eye protection);*
- *Working together in close proximity or sharing the same classroom environment with a MERS-CoV patient;*
- *Travelling together with MERS-CoV patient in any kind of conveyance;*
- *Living in the same household as a MERS-CoV patient.*

The epidemiological link may have occurred within a 14-day period before or after the onset of illness in the case under consideration.

[2] A cluster is defined as two or more persons with onset of symptoms within the same 14- day period and who areassociated with a specific setting, such as a classroom, workplace, household, extended family, hospital, other residential institution, military barracks or recreational camp.

<u>Probable case of MERS</u>

Three combinations of clinical, epidemiological and laboratory criteria can define a probable case of MERS:

- A person with a febrile acute respiratory illness with clinical, radiological, or histopathological evidence of pulmonary parenchymal disease (e.g. pneumonia or Acute Respiratory Distress Syndrome);

AND

Testing for MERS-CoV is unavailable or negative on a single inadequate specimen3;

AND

The patient has a direct epidemiologic-link4 with a confirmed MERS-CoV case.

- A person with a febrile acute respiratory illness with clinical, radiological, or

histopathological evidence of pulmonary parenchymal disease (e.g. pneumonia or Acute Respiratory Distress Syndrome);
AND
An inconclusive MERS-CoV laboratory test (that is, a positive screening test without confirmation)5;
AND
History of residing in / travel from the Middle East; or from other affected countries with active transmission within 14 days before onset of symptoms;

OR
Direct contact with dromedary (Arabian) camels or consumption or exposure to dromedary (Arabian) camel products (raw meat, unpasteurized milk, urine) in countries where MERS-CoV is known to be circulating in dromedary (Arabian) camel populations or where human infections occurred as a result of presumed zoonotic transmission; within 14 days before onset of symptoms.

- A person with an acute febrile respiratory illness of any severity;
  AND
  An inconclusive MERS-CoV laboratory test (that is, a positive screening test without confirmation)[5];
  AND
  The patient has a direct epidemiologic-link4 with a confirmed MERS-CoV case.

[3] *An inadequate specimen would include a nasopharyngeal swab without an accompanying lower respiratory specimen, a specimen that has had improper handling, is judged to be of poor quality by the testing laboratory or was taken too late in the course of illness.*

[4] *A direct epidemiological link may include:*
- *Close physical contact*
- *Working together in close proximity or sharing the same classroom environment*
- *Travelling together in any kind of conveyance*
- *Living in the same household*
- *The epidemiological link may have occurred within a 14-day period before or after the onset of illness in the case under consideration*

[5] *Inconclusive tests may include:*
- *A positive screening test without further confirmation such as testing positive on a single PCR target*
- *Serological assay considered positive by the testing laboratory*

Confirmed case
A person with laboratory confirmation of infection with the MERS-CoV.

Types of Surveillance

When to notify

All PUI, probable and confirmed cases of for MERS-CoV infection should be notified.

How to notify

A case should be notified to the nearest District Health Office within 24 hours of diagnosis. It is then followed by submission of the notification form manually or electronically via eNotifikasi.

Outbreak Situation

- Intensified surveillance and active finding of all the contacts for immediate isolation. Upon which, they will be placed at home or a designated premise under the order for supervision and observation.
- The field response activities should be conducted throughout 2 incubation period (i.e. 28 days) from the date of the last laboratory-confirmed MERS case.

Special Aspects

WHO requests that probable and confirmed cases be reported within 24 hours of classification, through the regional contact point for International Health Regulations at the appropriate WHO Regional Office.

Reference Laboratory:

Screening and First Confirmatory Test:

1. Hospital Sultanah Bahiyah, Alor Setar, Kedah
2. Hospital Pulau Pinang
3. Hospital Raja Permaisuri Bainun, Ipoh, Perak
4. Hospital Kuala Lumpur
5. Hospital Sungai Buloh, Selangor
6. Hospital Tuanku Jaafar, Seremban, Negeri Sembilan
7. Hospital Melaka
8. Hospital Sultanah Aminah, Johor Bahru, Johor
9. Hospital Tengku Ampuan Afzan, Kuantan, Pahang
10. Hospital Sultanah Nur Zahirah, Kuala Terengganu, Terengganu
11. Hospital Raja Perempuan Zainab II, Kota Bharu, Kelantan
12. Hospital Umum Sarawak, Kuching, Sarawak
13. Public Health Laboratory (PHL), Kota Kinabalu, Sabah – also responsible for handling of samples received from field response activities within Sarawak, Sabah and Labuan; involving contacts of a laboratory-confirmed case of MERS.
14. National Public Health Laboratory (NPHL), Sungai Buloh, Selangor – for handling samples received from field response activities within the Peninsular; involving contacts of a laboratory-confirmed case of MERS.

15. For handling samples received from private healthcare facilities nationwide:
    - Geneflux Diagnostics Sdn. Bhd., Bandar Puchong Jaya, Selangor; or
    - Lablink (M) Sdn. Bhd., Off Jalan Pahang, Kuala Lumpur; or
    - Pantai Premier Pathology Sdn. Bhd., Kuala Lumpur.

    Second Confirmatory Test and Reference Laboratory:
    - Institute for Medical Research (IMR), Kuala Lumpur

References

- WHO Global Alert and Response (GAR), Coronavirus infections (http://www.who.int/csr/disease/coronavirus_infections/en/).

- Directive from the Director General of Health Malaysia; ref. KKM.600-29/4/133(13) dated 24 November 2015.

Contact Information

Surveillance Sector
Disease Control Division
Ministry Of Health

Tel: 03-88834141 / 03-88834119
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MUMPS
(ICD 10: B26)

Case Definition

Clinical case definition

An illness with acute onset of unilateral or bilateral tender, self-limited swelling of the parotid or other salivary gland, lasting for ≥ 2 days, and without other apparent cause

Laboratory criteria for diagnosis

- Isolation of mumps virus from clinical specimen, or
- Significant rise between acute- and convalescent-phase titres in serum mumps immunoglobulin G antibody level by any standard serologic assay, or
- Positive serologic test for mumps immunoglobulin M (IgM) antibody.
- Detection of viral RNA in clinical specimen.

Case Classification

Suspected

A case that meets the clinical case definition, has non-contributory or no serologic or virologic testing, and is not epidemiologically linked to a confirmed or probable case.

Confirmed

A case that is laboratory confirmed OR that meets the clinical case definition and is epidemiologically linked to a confirmed case.

A laboratory-confirmed case does not need to fulfil the clinical case definition.

Note: Two suspected cases that are epidemiologically linked would be considered confirmed, even in the absence of laboratory confirmation.

Types of Surveillance

Nil.

Note: only outbreaks should be investigated.

Reference Laboratory:

NPHL.

Contact Information

VPD & FWBD Sector **Disease Control Division** **Ministry of Health**	Tel: 03 – 8883 4421 / 4504 Fax: 03 – 8888 6270 E-mail: cprc@moh.gov.my

NEONATAL TETANUS OR TETANUS NEONATORUM (ICD 10: A)

Case Definition

Clinical case definition

Neonatal Tetanus (< 28 days of age)

Any neonate with a normal ability to suck and cry in the first two days of life, and later between the 3rd and 28 days of age cannot suck normally, and become stiff or has convulsions (i.e. jerking of muscles) or both.

Laboratory criteria for diagnosis

Not applicable

Case Classification

Confirmed

A clinically compatible case as reported by a doctor. Diagnosis of the cases does not require laboratory or bacteriological confirmation

Types of Surveillance

Mandatory notification under the Prevention and Control of Infectious Disease Act 1988.

When to notify

Any case diagnose by the treating doctor as tetanus neonatorum should be notified.

How to notify

A tetanus case should be notified to the nearest District Health Office within 7 days from the diagnosis date.

Outbreak situations

Intensive surveillance requires to be maintained during outbreaks in view of high infectivity, variable incubation period, and increased mortality especially among neonates. Improve immunization coverage among women in reproductive age group especially antenatal women with high risk of poor antepartum and postpartum care should be stressed.

Special aspects

Nil.

Reference Laboratory

IMR.

Contact Information

VPD & FWBD Sector
Disease Control Division
Ministry of Health

Tel: 03 – 8883 4421 / 4504
Fax: 03 – 8888 6270
E-mail: cprc@moh.gov.my

OTHER TETANUS (ICD 10: A 33)

Case Definition

Clinical case definition

Other Tetanus (Children & Adults)
Acute onset of hypertonia and/or painful muscular contractions (usually of the muscles of the jaw and neck) and generalised muscle spasms without other apparent medical cause.

Laboratory criteria for diagnosis
Not applicable.

Case Classification

Confirmed
A clinically compatible case as reported by a doctor. Diagnosis of the cases does not require laboratory or bacteriological confirmation.

Types of Surveillance
Mandatory notification under the Prevention and Control of Infectious Disease Act 1988.

When to notify
Any case diagnose by the treating doctor as tetanus should be notified.

How to notify
A tetanus case should be notified to the nearest District Health Office within 7 days from the diagnosis date.

Special aspects
Nil.

Reference Laboratory
IMR.

Contact Information

VPD & FWBD Sector
Disease Control Division
Ministry of Health

Tel: 03 – 8883 4421 / 4504
Fax: 03 – 8888 6270
E-mail: cprc@moh.gov.my

PERTUSSIS (WHOOPING COUGH) (ICD 10: A 37.0)

Case Definition

Clinical case definition

A person with a cough **with at least one of the following:**

- Paroxysms (i.e. fits) of coughing
- inspiratory "whoop"
- post-tussive vomiting (i.e. vomiting immediately after coughing)
- without other apparent cause.

Laboratory criteria for diagnosis

- Isolation of Bordetella pertussis from clinical specimens or
- Positive polymerase chain reaction (PCR) for B. pertussis.

Case Classification

Suspected

A case that meets the clinical case definition.

Confirmed

A clinically compatible case that is laboratory confirmed.

Types of Surveillance

Mandatory notification under the Prevention and Control of Infectious Disease Act 1988.

When to notify

All suspected and confirmed case should be notified. However only confirmed case and clinically confirm case should be registered.

How to notify

A case should be notified to the nearest District Health Office within 7 days from date of diagnosis.

Outbreak situations

Intensive surveillance requires to be maintained during outbreaks in view of high infectivity, short incubation period, greater transmission risk and increased morbidity especially among under-five years of age.

Special Aspects

Nil.

References Laboratory

IMR.

Contact Information

VPD & FWBD Sector	Tel: 03 – 8883 4421 / 4504
Disease Control Division	Fax: 03 – 8888 6270
Ministry of Health	E-mail: cprc@moh.gov.my

PLAGUE
(ICD 10: A20.9)

Case Definition

Clinical case definition

Disease characterized by rapid onset of fever, chills, headache, severe malaise, prostration that manifest in one or more of the following clinical forms:

- Bubonic form (plague): Regional lymphadenitis-extreme painful swelling of lymph nodes (buboes).
- Pneumonic form (plague): cough with blood-stained sputum, chest pain, difficult breathing resulting from haematogenous spread in bubonic cases (secondary pneumonic plague) or inhalation of infectious droplets (primary pneumonic plague).
- Septicaemic form: Both forms above can progress to a septicaemia with toxaemia. Sepsis without evident buboes rarely occurs.

Laboratory criteria for diagnosis

- Isolation of *Yersinia pestis* in cultures from buboes, blood, CSF or sputum or
- Passive haemagglutination (PHA) test, demonstrating an at least fourfold rise in antibody titre, specific for F1 antigen of Y *pestis* as determined by haemagglutination test in paired sera.

Case Classification

Suspected

A case compatible with the clinical description.

Confirmed

A suspected case that is laboratory confirmed.

Types of Surveillance

Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988.

When to notify

All suspected and confirmed case should be notified.

How to notify

A plague case should be notified by phone to the nearest District Health Office within 24 hours of diagnosis. It is then followed by submission of the notification form.

During an outbreak

Intensified surveillance: active case-finding and contact tracing should be undertaken in order that treatment is started for cases and contacts; targeting environmental measures; community education. A daily report of the number of cases and contacts as well as their treatment status and vital status must be produced. A weekly report must

summarise the outbreak situation, the control measures taken, and those planned to interrupt the outbreak.

International

Mandatory reporting of all suspected and confirmed cases to WHO within 24 hours.

Special Aspects

Collaboration with Veterinary Department in surveillance that relevant to the disease.

Contact Information

Vector Borne Disease Sector
Disease Control Division
Ministry of Health

Tel: 03 - 8883 4276
Fax: 03 – 8888 6251 / 6215
E-mail: cprc@moh.gov.my

RABIES
(ICD 10: An 82)

Case Definition

Clinical case definition

Rabies is an acute neurological syndrome (encephalomyelitis) dominated by forms of hyperactivity or paralytic syndromes that almost always progresses towards coma and death, usually by respiratory failure, within 7-10 days after the first symptom if no intensive care is instituted. Other clinical symptoms include dysphagia, hydrophobia and convulsions.

Laboratory criteria for diagnosis

- Detection of rabies viral antigens by direct fluorescent antibody (DFA) or immunohistochemistry (IHC) in clinical specimens, preferably brain tissue (post mortem) or from skin or corneal scrapping/corneal touch impression (ante mortem).
- Isolation of rabies virus from clinical specimens.
- Detection of viral RNA by RT-PCR in clinical specimens.
- Detection by electron microscopy.

Case Classification

Suspected

A case that is compatible with the clinical definition.

Probable

A suspected case plus a history of contact or being bitten by a rabid animal.

Confirmed

A probable/suspected case that is laboratory-confirmed.

Types of Surveillance

Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988.

When to notify

Both probable/suspected and confirmed cases should be notified.

How to notify

A rabies case should be notified by phone to the nearest District Health Office within 24 hours of diagnosis. It is then followed by submission of the notification form.

Outbreak situations

Intensive surveillance together with Veterinary Services Department requires to be maintained during outbreaks in view of the number of persons exposed, greater transmission risk from rabid animals and increased mortality. This would assist in

the rationalized usage of vaccine and immunoglobulin.

Special Aspects

Collaboration with Veterinary Department (including Zoonotic Surveillance) to track rabid animals.

Reference Laboratory

Animal: Veterinary Research Institute.
Human: IMR.

Contact Information

Zoonosis Sector
Disease Control Division
Ministry of Health

Tel: 03-88834420
Fax: 03-88891013
Email : zoonosis@moh.gov.my

RELAPSING FEVER (ICD 10: A 68.9)

Case Definition

Clinical case definition

An acute febrile illness caused by spirochetes of the genus Borrelia. The high fevers of presenting patients spontaneously abate and then recur. It is transmitted to humans by 2 vectors, ticks and lice. Louse-borne relapsing fever is more severe than the tick-borne variety.

Clinical manifestations include abrupt onset of fever with prodromal symptoms, pulse is rapid in proportion to the fever, cough and systemic symptoms including gastrointestinal upset and jaundice.

Relapses episode characterized by:

- The primary febrile episode typically ends after 3-6 days by crisis that can culminate in fatal shock. About 7-10 days later, the first relapse occurs abruptly. Subsequent relapses tend to be less severe.
- The primary febrile episode, usually only 1-2.
- Louse-borne relapsing fever normally produces fewer relapses.
- In tick-borne disease, average episode of relapse is 3 but there can be more than 10.

Laboratory criteria for diagnosis

- Definitive diagnosis is established by visualizing spirochetes in smears of peripheral blood during a febrile episode.
- Multiple smears (both thick and thin, using Wright and Giemsa stains) may need to be examined.

Case Classification

Suspected

A case that is compatible with the clinical definition.

Confirmed

A suspected case that is laboratory-confirmed.

Types of Surveillance

Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988.

When to notify

All suspected and confirmed case should be notified.

How to notify

A relapsing fever case should be notified to the nearest District Health Office by submission of the notification form.

Outbreak situations

Intensive surveillance is requires to be maintained during outbreaks in view of number persons of persons exposed, greater transmission risk and increased mortality.

Special Aspects

Nil.

Reference Laboratory

IMR.

Contact Information

Vector Borne Disease Sector
Disease Control Division
Ministry of Health

Tel: 03 - 8883 4276
Fax: 03 – 8888 6251 / 6215
E-mail: cprc@moh.gov.my

RUBELLA
(ICD 10: B06.9)

Case Definition

Clinical case definition

Any person with fever and maculopapular rash and enlarged cervical lymph nodes or sub-occipital lymph nodes or post-auricular lymph nodes with or without arthralgia / arthritis.

Laboratory criteria for diagnosis

- Isolation of rubella virus, or
- Significant rise between acute and convalescent phase titers in serum rubella immunoglobulin G antibody level by any standard serologic assay, or
- Positive serologic test for rubella immunoglobulin M (IgM) antibody

Case Classification

Suspected

A case that meets the clinical case definition.

Probable

A person with sign and symptoms clinical rubella and who was in contact with a laboratory-confirmed case 12 to 23 days prior to onset of the disease.

Confirmed

A case that is laboratory confirmed.

Type of Surveillance

All cases with clinical presentation and suspected as Rubella should be notified as measles and serum send for confirmatory test. Case will be classified as Rubella in the module of Sistem Maklumat Siasatan Measles (SM2).

Outbreak situations

Intensive surveillance requires to be maintained during outbreak in view of high infectivity, short incubation period, greater transmission risk and increased morbidity especially among pregnant women.

Special Aspects

Nil.

Reference Laboratory

NPHL, IMR – For sero-prevalence study.

Contact Information

VPD & FWBD Sector	Tel: 03 – 8883 4421 / 4504
Disease Control Division	Fax: 03 – 8888 6270
Ministry of Health	E-mail: cprc@moh.gov.my

RUBELLA-CONGENITAL SYNDROME (CRS) (ICD 10: P35.0)

Case Definition

Clinical case definition

Any infant less than 1 year old who present with heart disease and/or suspicion of deafness and/or one or more of the following eye signs: cataract, diminish vision, nystagmus, squint, microphthalmus, or congenital glaucoma.

Laboratory criteria for diagnosis

- Isolation of rubella virus (from pharynx or urine), or
- Positive PCR for rubella virus; or
- Demonstration of rubella-specific immunoglobulin M antibody, or
- Infant rubella antibody level that persists at a higher level and for a longer period than expected from passive transfer of maternal antibody (i.e., rubella titre that does not drop at the expected rate of a twofold dilution per month)

Case Classification

Probable

A case that is not laboratory confirmed and has at least two of the complications below in A.

A criteria:

- cataract
- congenital glaucoma
- congenital heart disease
- loss of hearing
- retinal pigmentary

OR

One in A and one in B.

B criteria:

- purpura
- splenomegaly
- microcephaly
- mental retardation
- meningocephalitis
- radiolucent bone disease
- jaundice within 24 hours after birth

Confirmed

A clinically compatible case that is laboratory confirmed either positive blood test for

specific rubella IgM OR isolation of rubella virus or PCR positive..

Note: Congenital rubella infection is a case that demonstrates laboratory evidence of infection, but without any clinical symptoms or signs.

Comment: In probable cases, either or both of the eye-related findings (i.e., cataracts and congenital glaucoma) are interpreted as a single complication. In cases classified as infection only, if any compatible signs or symptoms (e.g., hearing loss) are identified later, the case is reclassified as confirmed.

Types of Surveillance

To be considered for inclusion in the First Schedule under the Prevention and Control of Infectious Disease Act 1988.

When to notify

Both probable and confirmed case should be notified within one (1) week.

Outbreak situations

Intensive surveillance requires to be maintained during outbreaks of rubella in view of high infectivity, short incubation period, greater transmission risk and increased morbidity and mortality.

Special Aspects

Nil.

Reference Laboratory

NPHL, IMR – For sero-prevalence study.

Contact Information

VPD & FWBD Sector
Disease Control Division
Ministry of Health

Tel: 03 – 8883 4421 / 4504
Fax: 03 – 8888 6270
E-mail: cprc@moh.gov.my

SALMONELLOSIS (ICD 10: A02.0)

Case Definition

Clinical case definition

An acute enterocolitis illness with sudden onset of abdominal pain, diarrhoea, fever and nausea with or without vomiting.
(NB; In many cases the initial presenting diagnosis maybe food poisoning and *Salmonella* spp isolated from clinical samples).

Laboratory criteria for confirmation

Isolation of *Salmonella species* from blood, stool or other clinical specimens.

Case Classification

Suspected

A case that fulfil the clinical case definition.

Confirmed

A suspected case with laboratory confirmation.

Types of Surveillance

Salmonella spp. other than Salmonella *typhi/paratyphi* should be informed through Laboratory-based Surveillance System.

Salmonella typhi/paratyphi (Typhoid / paratyphoid) cases should be notified under the Prevention and Control of Infectious Disease Act 1988.

When to notify

All *Salmonella spp* isolates should be sent to NPHL, PHL Ipoh or IMR for serotyping and line listing of the cases.

How to notify

A *salmonellosis* case should be notified to the nearest District Health Office within 7 days from the diagnosis date. However, only typhoid and paratyphoid cases should be registered.

Special Aspects

In an outbreak situation where the suspected vehicle is food, food samples should be taken for analysis of Salmonella. Attempt should be made to link between food samples and clinical samples. If both clinical samples and the affected food samples both isolated *Salmonella*, fingerprinting should be done to determine the source.

Reference lab

IMR, NPHL and PHL Ipoh: Identification of specific strain and fingerprinting for surveillance purposes and management of outbreak.

Contact Information

VPD & FWBD Sector
Disease Control Division
Ministry of Health

Tel: 03 – 8883 4421 / 4504
Fax: 03 – 8888 6270
E-mail: cprc@moh.gov.my

SEVERE ACUTE RESPIRATORY INFECTION (SARI)

Case Definition

Clinical case definition

An acute respiratory infection with:

- history of fever or measured fever of $\geq 38\,^{\circ}C$;
- and cough;
- with onset within the last 10 days;
- and requires hospitalization.

Laboratory criteria for diagnosis

Isolation of influenza virus via available tests, which include RT-PCR, viral culture, rapid diagnostic
(antigen) testing, immunofluorescence assays and serology.

Case Classification

Suspected

A case that meets the surveillance case definition.

Confirmed

A suspected case in which laboratory investigation confirms the presence of influenza virus in a clinical specimen.

Laboratory confirmation is not required for management of patient and compiling of SARI surveillance data.

Types of Surveillance

National Sentinel Surveillance of Influenza-Like Illness (ILI) and Severe Acute Respiratory Infection (SARI)

Reference Laboratory

The National Influenza Centre (NIC):

- The Institute of Medical Research (IMR).
- The University Malaya Medical Centre.

The National Influenza Laboratory (NIL):

- The National Public Health Laboratory (NPHL), Sungai Buloh, Selangor

References

- Malaysia Influenza Surveillance Protocol, MOH Malaysia, 2015.

- Global Epidemiological Surveillance Standards for Influenza, WHO, 2013.
- Case Definitions for Infectious Diseases in Malaysia, 2nd Edition, MOH Malaysia, 2006.

Contact Information

The National Influenza Surveillance Coordinator
Disease Surveillance Section
Disease Control Division
Ministry Of Health

Tel: 03-88834141 / 03-88834119
Fax: 03-88810400 / 03-88810500
E-mail: ili_survelan@moh.gov.my

SEVERE ACUTE RESPIRATORY SYNDROME (SARS) (ICD 10: B97.21)

Case Definition

Clinical case definition

A person with a history of fever (≥ 38°C)

AND

One or more symptoms of lower respiratory tract illness (cough, difficulty in breathing, shortness of breath)

AND

Radiographic evidence of lung infiltrates consistent with pneumonia or RDS OR autopsy findings consistent with the pathology of pneumonia or RDS without an identifiable cause.

AND

No alternative diagnosis can fully explain the illness.

Laboratory criteria for diagnosis

A person with symptoms and signs that are clinically suggestive of SARS **AND** positive laboratory findings for SARS-CoV based on one or more of the following diagnostic criteria:

a. ***PCR positive for SARS-CoV*** using a validated method from:

- at least two different clinical specimens (e.g. nasopharyngeal and stool)

OR

- The same clinical specimen collected on two or more occasions during the course of the illness (e.g. sequential nasopharyngeal aspirates)

OR

- Two different assays or repeat PCR using a new RNA extract from the original clinical sample on each occasion of testing.

b. ***Seroconversion by ELISA or IFA***

- Negative antibody test on acute serum followed by positive antibody test on convalescent phase serum tested in parallel

OR

- Fourfold or greater rise in antibody titre between acute and convalescent phase sera tested in parallel.

c. ***Virus isolation***

- Isolation in cell culture of SARS-CoV from any specimen

AND

PCR confirmation using a validated method.

Case Classification

Suspected
A case that meets the clinical case definition.

Confirmed
A suspected case in which laboratory investigation confirms the presence of SARS virus, either with positive antibody against SARS or detection of SARS-CoV in a clinical specimen.

Laboratory confirmation is **NOT** required for management of patient (isolation and epidemiological investigation) and notification of case.

Types of Surveillance
National Surveillance of SARS in Post-Outbreak Period.

Contact Information

Surveillance Sector
Disease Control Division
Ministry Of Health

Tel: 03-88834141 / 03-88834119
Fax: 03-88810400 / 03-88810500
E-mail: cprc@moh.gov.my

SYPHILIS
(ICD 10: A51.0, A51.4, A53.0, A52.3, A50.9)

Case Definition

1. Acquired

a. Primary Syphilis (ICD 10: A51.0)

Clinical case definition

- Characteristic lesion is the chancre (solitary, painless indurated ulcer), but atypical primary lesions may occur

Laboratory criteria for diagnosis

- Demonstration of *T. pallidum* in clinical specimens by dark field microscopy
- Serology.

b. Secondary Syphilis (ICD 10: A51.4)

Clinical case definition

A stage of infection caused by *T. pallidum* and characterized by:

- Localised or diffused mucocutaneous lesion and generalized lymphadenopathy.
- Constitutional symptoms which are common and clinical manifestations are protean.
- The primary chancre may still be present.

Laboratory criteria for diagnosis

- Demonstration of *T. pallidum* in clinical specimens by dark field microscopy
- Serology

c. Latent Syphilis (ICD 10: A53.0)

Clinical case definition

- A stage of asymptomatic infection due to *T. pallidum*
- Latent syphilis is subdivided into early latent syphilis when duration of infection is < 24 months and late latent syphilis after >24 months from initial infection

Presence of one or more of the following criteria indicates early latent syphilis:

- A non-reactive serology test for syphilis or a non-treponemal titre that has dropped fourfold within the past 24 months
- A history of symptoms consistent with primary or secondary syphilis without a history of subsequent treatment in the past 24 months.
- A history of sexual exposure to a partner with confirmed or presumptive primary or secondary syphilis or presumptive early latent syphilis and no history of treatment in the past 24 months.
- Reactive non-treponemal and treponemal tests from an individual whose only

possible exposure occurred within the preceding 24 months.

Late latent syphilis cases are those without the above criteria.

Laboratory criteria for diagnosis

- Demonstration of *T. pallidum* by dark field microscopy.
- Serology.

d. Neurosyphilis (A52.3)

Clinical case definition

- Evidence of central nervous system (CNS) infection with *T. pallidum*.

Laboratory criteria for diagnosis

- A reactive serologic test for syphilis and reactive VDRL in cerebrospinal fluid (CSF).

2. Congenital Syphilis (A50.9)

Clinical case definition

- A condition caused by infection in utero with *T. pallidum*. A wide spectrum of severity exists, and only severe cases are clinically apparent at birth.
- An infant or child (< 2 years) may have signs such as hepatosplenomegaly, characteristic skin rash, condyloma lata, snuffles, jaundice (non-viral hepatitis), pseudo paralysis, anaemia, or oedema (nephrotic syndrome and /malnutrition).
- An older child may have stigmata such as interstitial keratitis, nerve deafness, anterior bowing of shins, frontal bossing, mulberry molars, Hutchinson teeth, saddle nose, rhagades, or Clutton's joints.

Laboratory criteria for diagnosis

- Demonstration of *T. pallidum* by dark field microscopy.
- Serology.

Case Classification

Confirmed

A clinically compatible case that is laboratory confirmed.

Types of Surveillance

Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988

When to notify

Only confirmed cases should be notified.

How to notify

A syphilis case should be notified to the nearest District Health Office by submission of the notification form within 7 days from the diagnosis date.

Contact Information

HIV/STI/Hepatitis C Sector
Disease Control Division
Ministry of Health

Tel: 03-8883 4262
Fax: 03-8883 4285
E-mail: cprc@moh.gov.my

TUBERCULOSIS (CD 10: A 15-A19)

Case Definition

Bacteriologically Confirmed Tuberculosis

A bacteriologically confirmed TB case is one from whom a biological specimen is positive by smear microscopy, culture or WRD (such as Xpert MTB/RIF). All such cases should be notified, regardless of whether TB treatment has started.

Clinically Diagnosed Tuberculosis

A clinically diagnosed TB case is one who does not fulfil the criteria for bacteriological confirmation but has been diagnosed with active TB by a clinician or other medical practitioner who has decided to give the patient a full course of TB treatment. This definition includes cases diagnosed on the basis of X-ray abnormalities or suggestive histology and extra pulmonary cases without laboratory confirmation. Clinically diagnosed cases subsequently found to be bacteriologically positive (before or after starting treatment) should be reclassified as bacteriologically confirmed.

Bacteriologically confirmed or clinically diagnosed cases of TB are also classified according to:

- anatomical site of disease;
- history of previous treatment;
- drug resistance;
- HIV status.

Case classification

Classification based on anatomical site of disease

Pulmonary tuberculosis (PTB) refers to any bacteriologically confirmed or clinically diagnosed case of TB involving the lung parenchyma or the tracheobronchial tree. Miliary TB is classified as PTB because there are lesions in the lungs. Tuberculous intra-thoracic lymphadenopathy (mediastinal and/or hilar) or tuberculous pleural effusion, without radiographic abnormalities in the lungs, constitutes a case of extra pulmonary TB. A patient with both pulmonary and extra pulmonary TB should be classified as a case of PTB.

Extra pulmonary tuberculosis (EPTB) refers to any bacteriologically confirmed or clinically diagnosed case of TB involving organs other than the lungs, e.g. pleura, lymph nodes, abdomen, genitourinary tract, skin, joints and bones, meninges.

Classification based on history of previous TB treatment (patient registration group)

Classifications based on history of previous TB treatment are slightly different from those previously published. They focus only on history of previous treatment and are independent of bacteriological confirmation or site of disease. Also note that the registration groups for DR-TB are slightly different and are described in the *Companion handbook to the 2011*

WHO guidelines for the programmatic management of drug-resistant tuberculosis, due for publication by WHO in 2013.

New patients have never been treated for TB or have taken anti-TB drugs for less than 1 month.

Previously treated patients have received 1 month or more of anti-TB drugs in the past. They are further classified by the outcome of their most recent course of treatment as follows:

Relapse patients have previously been treated for TB, were declared cured or treatment completed at the end of their most recent course of treatment, and are now diagnosed with a recurrent episode of TB (either a true relapse or a new episode of TB caused by reinfection).

Treatment after failure patients are those who have previously been treated for TB and whose treatment failed at the end of their most recent course of treatment.

Treatment after loss to follow-up patients have previously been treated for TB and were declared lost to follow-up at the end of their most recent course of treatment. (These were previously known as treatment after default patients.)

Other previously treated patients are those who have previously been treated for TB but whose outcome after their most recent course of treatment is unknown or undocumented.

Patients with unknown previous TB treatment history do not fit into any of the categories listed above.

New and relapse cases of TB are **incident** TB cases.

Classification based on HIV status

HIV-positive TB patient refers to any bacteriologically confirmed or clinically diagnosed case of TB who has a positive result from HIV testing conducted at the time of TB diagnosis or other documented evidence of enrolment in HIV care, such as enrolment in the pre-ART register or in the ART register once ART has been started.

HIV-negative TB patient refers to any bacteriologically confirmed or clinically diagnosed case of TB who has a negative result from HIV testing conducted at the time of TB diagnosis. Any HIV-negative TB patient subsequently found to be HIV-positive should be reclassified accordingly.

HIV status unknown TB patient refers to any bacteriologically confirmed or clinically diagnosed case of TB who has no result of HIV testing and no other documented

evidence of enrolment in HIV care. If the patient's HIV status is subsequently determined, he or she should be reclassified accordingly.

Classification based on drug resistance

Cases are classified in categories based on drug susceptibility testing (DST) of clinical isolates confirmed to be *M. tuberculosis*:

- **Monoresistance:** resistance to one first-line anti-TB drug only.
- **Polydrug resistance**: resistance to more than one first-line anti-TB drug (other than both isoniazid and rifampicin).
- **Multidrug resistance:** resistance to at least both isoniazid and rifampicin.
- **Extensive drug resistance:** resistance to any fluoroquinolone and to at least one of three second-line injectable drugs (capreomycin, kanamycin and amikacin), in addition to multidrug resistance.
- Rifampicin resistance: resistance to rifampicin detected using phenotypic or genotypic methods, with or without resistance to other anti-TB drugs. It includes any resistance to rifampicin, whether monoresistance, multidrug resistance, polydrug resistance or extensive drug resistance.

Types of Surveillance

Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988.

When to notify

Any case(s) that fulfilled any of the above case definition should be notified.

How to notify

A tuberculosis case should be notified to the nearest District Health Office by submission of the notification form within 7 days from the diagnosis date.

Special Aspects

Nil.

References Laboratory

NPHL: For strain identification and pattern of drug resistance in relation to epidemiological distribution.

Contact Information

TB/Leprosy Sector
Disease Control Division
Ministry of Health

Tel: 03 – 8883 4507
Fax: 03 – 8888 6270
E-mail:cprc@moh.gov.my

TYPHOID / PARATYPHOID
ICD 10: A01.0/A01.1-A01.4

Case Definition

Clinical case definition
An illness with insidious onset of prolonged fever, constitutional symptoms (e.g. malaise, headache, anorexia), non-productive cough in the early stage of the illness, constipation more often than diarrhoea and hepatosplenomegaly. Rose spots are often seen in fair-skinned patients.

Laboratory criteria for confirmation
Isolation of *Salmonella typhi/paratyphi* from blood, stool or other clinical specimens.

Case Classification

Suspected
A case that fulfils the clinical case definition.

Probable
A suspected case with positive serology or antigen detection test but without isolation of *Salmonella typhi/paratyphi*

Confirmed
A suspected case with Isolation of *Salmonella typhi/paratyphi* from blood, stool or other clinical
specimens.

Types of Surveillance
Mandatory notification under the Prevention and Control of Infectious Diseases Act 1988.

When to notify
Any suspected, probable or confirmed case should be notified within 7 days from the diagnosis date.

How to notify
A *Salmonella typhi/paratyphi* case should be notified to the nearest District Health Office. Only laboratory confirmed cases should be registered.

Outbreak situation
Surveillance should be intensified with the introduction of active case finding. The isolates should be sent for finger printing to determine the source. Food or water samples should be sent for *Salmonella typhi/paratyphi*.

Special Aspects

If the suspected cases are food handlers (typhoid carrier), they should not be allowed to handle food. If they are confirmed cases, they should complete the full course of treatment. *Salmonella typhi* cases should be followed up with stool culture at 1, 2, 3, 6 and 12 months post hospital discharge. Typhoid cases are discharged from hospital after 3 consecutive stool cultures taken negative for *Salmonella typhi*.

Reference laboratory

IMR and PHL Ipoh: Identification of specific strain and fingerprinting for surveillance purposes.

IMR and NPHL: Specialised in finger printing for molecular epidemiologic surveillance.

Contact Information

VPD & FWBD Sector
Disease Control Division
Ministry of Health

Tel: 03 – 8883 4421 / 4503
Fax: 03 – 8888 6270
E-mail: cprc@moh.gov.my

TYPHUS
(ICD 10: A75.9)

Case Definition

Clinical case definition

a. Scrub typhus (mite-borne)

- Acute onset of fever associated with headache, rash, profuse sweating, myalgia and gastrointestinal symptoms.
- Classical triad of
- Eschar ('punched out' skin ulcer where the bite(s) occurs);
- Regional lymphadenopathy;
- Maculopapular rash within a week on the trunk & extends to the extremities (seen seldom in indigenous population).
- Severe cases: Encephalitis and interstitial pneumonitis as a prominent feature.

b. Murine typhus (louse-borne)

- Presence of fever with chills, headache, myalgia and arthralgia.
- Maculopapular rash especially over the axilla and inner surfaces of arms and trunk.
- Pulmonary involvement, non-productive cough, effusion and infiltrate in the Chest X-ray.

c. Tick typhus (tick-borne)

- Presence of high grade fever, headache and prostration.
- Skin rash (maculopapular, petechiae appear on the fifth day of illness).
- Multisystem involvement and prominent neurological manifestation.

(**Note:** Response within 48 hours following tetracycline therapy strongly suggests a rickettsiae infection).

Laboratory criteria for diagnosis

- Positive immunoperoxidase test, with IgG titre >1:400 or IgM ≥1:50 or four fold rise in antibody titre in paired serum.

- Isolation of *"Rickettsia tsutsutgamushi"* by inoculation of patient blood in white mice (preferably treated with cyclophosphamide at 0.2mg/g intraperitoneally or intramuscularly on day 1, 2 and 4 after inoculation).

Case Classification

Suspected

A case that is compatible with the clinical description.

Confirmed
A suspected case with laboratory confirmation.

Types of Surveillance
Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988.

When to notify
Any suspected or confirmed case should be notified.

How to notify
A typhus case should be notified to the nearest District Health Office by submission of the notification form within 7 days from the diagnosis date.

Special Aspects
Nil.

Reference Laboratory
IMR: For strain identification and epidemiological surveillance.

Contact Information

Vector Borne Disease Sector
Disease Control Division
Ministry of Health

Tel: 03 - 8883 4276
Fax: 03 – 8888 6251 / 6215
E-mail: cprc@moh.gov.my

YELLOW FEVER (ICD 10: A95.9)

Case Definition

Clinical case definition

A mosquito-borne illness characterized by acute onset of fever followed by jaundice within 2 weeks of onset of first symptoms. Haemorrhagic manifestations and signs of renal failure may occur. Travel history to an endemic area is helpful in diagnosis.

Laboratory criteria for diagnosis

- Isolation of yellow fever virus, or
- Detection of yellow fever virus genomic sequences in blood or organs by RT-PCR, or
- Detection of yellow fever antigen in histopathology specimen by immunohistochemistry, or
- Presence of yellow fever specific IgM (it is important to obtain a yellow fever vaccination history, as IgM antibodies to yellow fever vaccine virus can persist for several years following vaccination) or
- A four-fold or greater rise in serum IgG levels in paired sera (acute and convalescent)

Case Classification

Suspected

A case that is compatible with the clinical description.

Confirmed

A suspected case that is laboratory confirmed or epidemiologically linked to a confirmed case or outbreak.

Types of Surveillance

Mandatory National Notification of Infectious Diseases under the Infectious Disease Prevention and Control Act 1988.

When to notify

Any suspected or confirmed case should be notified.

How to notify

A suspected or confirmed yellow fever case should be notified by phone to the nearest District Health Office within 24 hours of diagnosis. It is then followed by submission of the notification form.

Special Aspects

Mandatory reporting of all suspected and confirmed cases to WHO within 24 hours of diagnosis.

References Laboratory

IMR and NPHL.

Contact Information

Vector Borne Disease Sector
Disease Control Division
Ministry of Health

Tel: 03 - 8883 4276
Fax: 03 – 8888 6251 / 6215
E-mail: cprc@moh.gov.my

International Health Sector
Disease Control Division
Ministry Of Health

Tel:03 – 8883 4118
Fax: 03 – 03-8888 6277
E-mail: cprc@moh.gov.my

ZIKA VIRUS DISEASE (ICD 10: A92.5)

Case Definition

Clinical case definition

a. Any person with rash (usually pruritic and maculopapular) with 2 or more of the following symptoms:
- Fever
- Arthralgia
- Arthritis/ periarticular oedema
- Conjunctivitis (Non-purulent/ hyperaemia)

AND

Recent history of travelling to the country / affected area with Zika infection (within 7 days after arrival) or history of *contact with confirmed Zika case.

***Contact is:**
Person who has association with a confirmed case within 2 weeks after onset, example: in the same household or has a history of sexual intercourse with a confirmed case within 6 months after onset.

b. Any person with Guillain-Barre Syndrome (GBS)
Signs and symptoms of Guillain-Barre syndrome may include:
- Prickling, “pins and needles” sensations in your fingers, toes, ankles or wrists
- Weakness in your legs that spreads to your upper body
- Unsteady walking or inability to walk or climb stairs
- Difficulty with eye or facial movements, including speaking, chewing or swallowing
- Severe pain that may feel achy or cramp-like and may be worse at night
- Difficulty with bladder control or bowel function
- Rapid heart rate, Low or high blood pressure
- Difficulty breathing

c. Any person with Microcephaly diagnosed in utero or postnatal using standard growth chart and other congenital malformation of central nervous system diagnosed by medical profession

Laboratory criteria

Presence of Zika virus by PCR blood or urine.

Case Classification

Suspected:

Any person clinically compatible with the case definition.

Confirmed
A suspected case with laboratory positive result for the specific detection of Zika virus.

Types of Surveillance
Mandatory notification under the Prevention and Control of Infectious Diseases (Amendment of First Schedule) Order 2016. This Order comes into operation on 1st December 2016.

When to notify
All cases, suspect or confirmed should be notified after diagnosis been made.

How to notify
A case should be notified to the nearest District Health Office.

Special Aspects:
Besides being transmitted by Aedes mosquitoes, Zika virus can also be transmitted via sexual contact and mother to child during pregnancy.

References Laboratory:
NPHL and IMR - For Zika virus confirmation and strain identification.

Contact Information

Vector Borne Disease Sector
Disease Control Division
Ministry of Health

Tel: 03 - 8883 4276
Fax: 03 – 8888 6251 / 6215
E-mail: cprc@moh.gov.my

Appendix 1: Notification form for notifiable diseases

*JADUAL
(Peraturan 2)
Borang
(Peraturan 2)
AKTA PENCEGAHAN DAN PENGAWALAN PENYAKIT BERJANGKIT 1988
PERATURAN-PERATURAN PENCEGAHAN DAN PENGAWALAN PENYAKIT BERJANGKIT (BORANG NOTIS) (PINDAAN) 2011

Borang Notis: Rev/2010
No. Siri:

NOTIFIKASI PENYAKIT BERJANGKIT YANG PERLU DILAPORKAN

(Seksyen 10, Akta Pencegahan Dan Pengawalan Penyakit Berjangkit 1988)

A. MAKLUMAT PESAKIT

1. Nama Penuh (HURUF BESAR):

Nama Pengiring (Ibu/Bapa/Penjaga):
(Jika belum mempunyai Kad Pengenalan diri)

2. No. Kad Pengenalan Diri / Dokumen Perjalanan ☐ Sendiri ☐ Pengiring
(Untuk Bukan Warganegara)

No. Daftar: Nama Wad:_____ Tarikh Masuk Wad: / /

3. Kewarganegaraan:
Warganegara:
☐ Ya Keturunan:
Sukuketurunan:
(Untuk Orang Asli, Pribumi Sabah/Sarawak)
☐ Tidak Negara Asal:
Status Kedatangan: ☐ Izin ☐ Tanpa Izin ☐ Penduduk Tetap

4. Jantina: ☐ Lelaki ☐ Perempuan

5. Tarikh Lahir: / /

6. Umur: ☐ Tahun ☐ Bulan ☐ Hari

7. Pekerjaan:_____
(Jika tidak bekerja, nyatakan status diri)

8. No. Telefon: ☐ Rumah ☐ Tel. Bimbit ☐ Pejabat -
(Untuk dihubungi)

9. Alamat Kediaman

10. Alamat Tempat Kerja / Belajar:

B. DIAGNOSIS PENYAKIT

☐ 1. Poliomyelitis
☐ 2. Viral Hepatitis A
☐ 3. Viral Hepatitis B
☐ 4. Viral Hepatitis C
☐ 5. Viral Hepatitis - *(Others)*
☐ 6. AIDS
☐ 7. Chancroid
☐ 8. Cholera
☐ 9. Dengue Fever
☐ 10. Dengue Haemorrhagic Fever
☐ 11. Diphtheria
☐ 12. Dysentery
☐ 13. Ebola
☐ 14. Food Poisoning
☐ 15. Gonorrhoea
☐ 16. Hand, Food and Mouth Disease
☐ 17. Human Immunodeficiency Virus Infection
☐ 18. Influenza
☐ 19. Leprosy *(Multibacillary)*
☐ 20. Leprosy *(Paucibacillary)*
☐ 21. Leptospirosis
☐ 22. Malaria - *Vivax*
☐ 23. Malaria - *Falciparum*
☐ 24. Malaria - *Malariae*
☐ 25. Malaria - *Others*
☐ 26. Measles
☐ 27. Plague
☐ 28. Rabies
☐ 29. Relapsing Fever
☐ 30. Syphilis - *Congenital*
☐ 31. Syphilis - Acquired
☐ 32. Tetanus Neonatorum
☐ 33. Tetanus *(Others)*
☐ 34. Typhus - *Scrub*
☐ 35. Tuberculosis - *PTB Smear Positive*
☐ 36. Tuberculosis - *PTB Smear Negative*
☐ 37. Tuberculosis - *Extra Pulmonary*
☐ 38. Typhoid - *Salmonella typhi*
☐ 39. Typhoid - *Paratyphoid*
☐ 40. Viral Encephalitis - *Japanese*
☐ 41. Viral Encephalitis - *Nipah*
☐ 42 Viral Encephalitis - *(Others)*
☐ 43. Whooping Cough / Pertussis
☐ 44. Yellow Fever
☐ 45. Lain-lain - nyatakan: _____

Selain dari notifikasi bertulis, penyakit berikut perlu dinotifikasi melalui telefon dalam tempoh 24 jam iaitu:- Poliomielitis, Kolera, Demam Denggi, Diptheria, Ebola, Keracunan Makanan, Plague, Rabies dan Demam Kuning.

11. Cara Pengesanan Kes:
☐ Kes ☐ Kontak ☐ POMEMA*
☐ Ujian Saringan _____

12. Status Pesakit:
☐ Hidup
☐ Mati - -

13. Tarikh Onset: - -

14. Ujian Makmal:
Nama Ujian: (i)_____
(ii)_____ (iii)_____
Tarikh Sampel Diambil: - -

15. Keputusan Ujian Makmal:
☐ Positif (_____)
☐ Negatif
☐ Belum Siap

16. Status Diagnosis:
☐ Sementara *(Provisional/Suspected)*
☐ Disahkan *(Confirmed)*
Tarikh Diagnosis - -

17. Maklumat Klinikal Yang Relevan:

18. Komen:

C. MAKLUMAT PEMBERITAHU

19. Nama Pengamal Perubatan:

20. Nama Hospital / Klinik dan Alamat:

21. Tarikh Notifikasi: - -

.....
Tandatangan
Pengamal Perubatan

Appendix 2: Notification form for SARS cases

KKM/BKP/SARS/2003/Pind.3

NOTIFICATION FORM
FOR SEVERE ACUTE RESPIRATORY SYNDROME (SARS)

Disease Control Division

Ministry Of Health Malaysia

Note: Please fax this form within 24 hours to District Health Office

For Disease Control Division use only
ID No:

1.Reporting Centre	**Name of Hospital:**		**State**
Phone:	**Fax:**	**E-mail:**	

2. Information of Patient	**Name:**	**Age**	**Sex** ( ) **Male** ( ) **Female**
Address:		**Phone(Home):**	**RN No:**
		H/Phone:	
Nationality	( ) Malaysian	**Ethnicity: M / C / I / Other** Please specify:	**IC No:**
	( ) Non Malaysian	Country of Origin	**Passport No:**
Healthcare worker ( ) **Yes**. Category: _____ Place: _____ (Ward/clinic/etc) ( ) **No**			**Date of symptom onset [dd/mm/yr]**

3.Signs and Symptoms	( ) Fever	( ) Cough	
	Temperature: °C	Place taken: oral / axilla / other (Specify)	
4.Chest X-ray finding	Evidence of lung infiltrates consistent with pneumonia or RDS ( ) Yes ( ) No		
5. Is there any alternative diagnosis that can fully explain patient's illness?	( ) Yes ( ) No		
6.Clinical status at time of report	Was patient hospitalized? ( ) Yes, Date: ( ) Brought In Dead (BID) Date:	Ward: ( ) Isolation ward ( ) General ward ( ) ICU	Ward ( ) On treatment ( ) Died Date:
If patient died: Was an autopsy performed? ( ) Yes ( ) No ( ) Pending		Was pathology consistent with Respiratory Distress Syndrome? ( ) Yes ( ) No	
7.Exposure History	Indicate if the patient was in *close contact with SARS case: ( ) Yes ( ) No	If yes, please state the name and address of the person	
	Name: Address:		
8.Travel History	Has the patient travelled to any of the following destinations within 10 days prior to onset of symptoms ( ) Yes , if yes please state the country ( ) No		

	Country/State/ province visited	Duration of stay		Name of Airline & Flight No/ Cruise/ Other mode of transportation
		From[dd/mm/yr]	To[dd/mm/yr]	
1				
2				
3				
Date of return to Malaysia:			Entry point:	

9.Diagnostic Evaluation	Date taken	Date send to IMR	Result
Virology			
10. Working diagnosis (Please state)			
11. Contact tracing (to be filled by District Helath Office)	Has contact tracing been initiated? ( ) Yes ( ) No Number of contacts: ..... No. on home quarantine: ..... No. on active surveillance:		
12.Reporting Officer:		Signature:	
Designation:		Date:	H/Phone No:
For Disease Control Division use only			
	SARS Not SARS	Comments:	
Review by : Date:			

Close contact: having cared for, lived with, or had direct contact with respiratory secretions or body fluids of a suspect or probable case of SARS

STATE AND DISTRICT HEALTH OFFICE CONTACT INFORMATION

STATE	OFFICE	PHONE / FAX NUMBER
PERLIS	Jabatan Kesihatan Negeri Perlis Jalan Raja Syed Alwi, 01000 Kangar, Perlis	Tel : 04-9773333 Fax : 04-9760764/9774855 Web: http://jknperlis.moh.gov.my
	Pejabat Kesihatan Daerah Kangar Jalan Abi Tok Hashim 01000 Kangar, Perlis	Tel : 04-9761388 Fax : 04-9774517
KEDAH	Jabatan Kesihatan Negeri Kedah Jalan Kuala Kedah, 05400 Simpang Kuala, Kedah Darul Aman	Tel : 04-7741000 Fax : 04-7741005 Web: http://jknkedah.moh.gov.my
	Pejabat Kesihatan Daerah Langkawi Tingkat 6 Kompleks LADA Langkawi, Kedah, 07000 Kuah, Kedah	Tel : 04-9667141 Fax : 04-9669034
	Pejabat Kesihatan Daerah Kubang Pasu, Jitra Kubang Pasu, 06000 Jitra, Kedah	Tel : 04-9171355 Fax : 04-9178644
	Pejabat Kesihatan Daerah Kota Setar Blok A, Aras 1, Hospital Alor Setar (Hospital Lama) Alor Setar Leb-uhraya Darulaman, Kedah, 05100 Alor Setar, Kedah	Tel : 04-7332775 Fax : 04-7347295
	Pejabat Kesihatan Daerah Kuala Muda Jalan Badlishah, 08000 Sungai Petani, Kedah	Tel : 04-4213355 Fax : 04-4210076
	Pejabat Kesihatan Daerah Padang Terap, 06300 Kuala Nerang, Kedah	Tel : 04- 7866094 Fax : 04-7864722

STATE	OFFICE	PHONE / FAX NUMBER
	Pejabat Kesihatan Daerah Baling Jln Weng, 09100 Baling, Kedah	Tel : 04-4701351 Fax : 04-4701131
	Pejabat Kesihatan Daerah Kulim Jalan Tasik, 09000 Kulim, Kedah	Tel : 04-4949000 Fax : 04-4911843
	Pejabat Kesihatan Bandar Baharu Serdang, Kedah, 09800 Bandar Bharu, Kedah	Tel : 04-4079446/4079448 Fax : 04-4079611
	Pejabat Kesihatan Daerah Yan Guar Chempedak, 08800 Yan, Kedah	Tel : 04-4682557 Fax : 04-4684251
	Pejabat Kesihatan Daerah Pendang Jln Sg. Tiang, Pendang, 06700 Pendang, Kedah	Tel : 04-7591773 Fax : 04-7594963
	Pejabat Kesihatan Daerah Sik Jalan Tunku Ibrahim, 08200 Sik, Kedah	Tel : 04-4690600 Fax : 04-4695682/0602
PENANG	Jabatan Kesihatan Negeri Pulau Pinang Tingkat 35 & 37, KOMTAR, 10590 Pulau Pinang.	Tel : 04-2625533 Fax : 04-2613508 Web : http://jknpenang.moh.gov.my
	Pejabat Kesihatan Daerah Seberang Perai Selatan Lot 1866, Mukim 7, Jalan Bukit Panchor, 14300 Nibong Tebal, Pulau Pinang	Tel : 04-5931679/5892 Fax : 04-5939086
	Pejabat Kesihatan Daerah Seberang Perai Tengah Lot 89, Mukim 17, Berapit 14000 Bukit Mertajam, Pulau Pinang	Tel : 04-5382453/ 5381454 Fax : 04-5374595

STATE	OFFICE	PHONE / FAX NUMBER
	Pejabat Kesihatan Daerah Seberang Perai Utara Aras 1, Wisma Persekutuan Jalan Bertam 2 Kepala Batas Pulau Pinang, 13200 Butterworth, Pulau Pinang	Tel : 04-5755533 Fax : 04-5754433
	Pejabat Kesihatan Daerah Timur Laut Jalan Perak, Georgetown 11600 Pulau Pinang	Tel : 04-2828500 Fax : 04-2819500
	Pejabat Kesihatan Daerah Barat Daya 2761 Air Putih, 11000 Balik Pulau, Pulau Pinang	Tel : 04-8668357 Fax : 04-8660745
	Pejabat Kesihatan Perlabuhan & Lapangan Terbang Antarabangsa Pulau Pinang Tingkat 1, Bangunan Tuanku Syed Putra, Lebuh Downing 10300 Georgetown Pulau Pinang	Tel : 04-6436596 Fax : 04-6432123
PERAK	Jabatan Kesihatan Negeri Perak Jalan Panglima Bukit Gantang Wahab, 30590 Ipoh, Perak Darul Ridzuan.	Tel : 05-2456000 Fax : 05-2438090/2535660 Web: http://jknperak.moh.gov.my
	Pejabat Kesihatan Daerah Kinta Jalan Aman, 31000 Batu Gajah, Perak	Tel : 05-3652062 Fax : 05-3668073
	Pejabat Kesihatan Daerah Kuala Kangsar Jalan Sultan Idris Shah 1 33000 Kuala Kangsar, Perak	Tel : 05-7761355/ 7763355 Fax : 05-7760612

STATE	OFFICE	PHONE / FAX NUMBER
	Pejabat Kesihatan Daerah Kerian Jalan Sekolah Parit Buntar, 34200 Kerian, Perak	Tel : 05-7162355 Fax : 05-7165355
	Pejabat Kesihatan Daerah Hilir Perak Jalan Maharajalela 36000 Teluk Intan, Perak	Tel : 05-6221011/ 2033/4828 Fax : 05-6212401
	Pejabat Kesihatan Daerah Perak Tengah Jalan Ipoh Lumut Sri Iskandar, 32610 Bota, Perak	Tel : 05-3711891 / 892 Fax : 05-3711890
	Pejabat Kesihatan Daerah Larut Matang & Selama Tingkat 2, Wisma Persekutuan Jalan Istana Larut, 34000 Taiping, Perak	Tel : 05-8072027/ 2302 Fax : 05-8064049
	Pejabat Kesihatan Daerah Manjung Jalan Dato' Ahmad Yunus, 32000 Setiawan, Perak	Tel : 05-6913355/ 6918277/ 6918269 Fax : 05-6919545
	Pejabat Kesihatan Daerah Batang Padang Jalan Temoh, 35000 Tapah, Perak	Tel : 05-4011342 Fax : 05-4014364
	Pejabat Kesihatan Daerah Hulu Perak Aras 3, Wisma Persekutuan, Jalan Intan, 33300 Gerik, Perak	Tel : 05-7911335 / 1342/1345 Fax : 05-7911426
SELANGOR	Jabatan Kesihatan Negeri Selangor Tingkat 9, 10, 11 & 17, No. 1, Wisma Sunway, Jalan Tengku Ampuan Zabedah C 9/C, Seksyen 9, 40100 Shah Alam, Selangor	Tel : 603-5123 7333/ 334/ 335 Fax : 603-5123 7202 Web : http://jknselangor.moh.gov.my

STATE	OFFICE	PHONE / FAX NUMBER
	Pejabat Kesihatan Daerah Hulu Langat Lot 7523, Jalan Hentian Kajang 1C Pusat Hentian Kajang, Jalan Reko 43000 Kajang, Selangor	Tel : 03-87367770/0614 Fax : 03-87369687
	Pejabat Kesihatan Daerah Hulu Selangor JKR NO 1458, 44000 Kuala Kubu Baru, Selangor	Tel : 03-60641216 Fax : 03-60642425
	Pejabat Kesihatan Daerah Kuala Selangor, Jalan Semarak, 45000 Kuala Selangor, Selangor	Tel : 03-32893454 32893455 Fax : 03-32895044
	Pejabat Kesihatan Daerah Sabak Bernam Kompleks Pejabat Kerajaan, Sungai Besar, Sabak Bernam, 45300 Selangor	Tel : 03-32242355 Fax : 03-32241354
	Pejabat Kesihatan Daerah Kuala Langat Jalan Sulatan Alam Shah, 42700 Banting, Selangor	Tel : 03-31872355/2972 Fax : 03-31814196
	Pejabat Kesihatan Daerah Klang Block B, Jalan Langat, Bandar Botanik, Kelang, 41200 Klang, Selangor	Tel : 03-33239554 Fax : 03-33239461
	Pejabat Kesihatan Pelabuhan Klang Persiaran Raja Muda Musa Pelabuhan Klang, 42000 Klang, Selangor	Tel : 03-31686364 Fax : 03-3168417
	Pejabat Kesihatan Daerah Sepang Jalan Salak 43900 Sepang, Selangor	Tel : 03-87066001/6158/1302 Fax : 03-87066002

STATE	OFFICE	PHONE / FAX NUMBER
	Pejabat kesihatan Lapangan Terbang Antarabangsa Tkt.1, Bangunan Pentadbiran KLIA 64000 Sepang, Selangor	Tel : 03-87768399 Fax : 03-87872054
	Pejabat Kesihatan Daerah Gombak No.23-25 Jalan 2/8, Bandar Baru Selayang 68100 Batu Caves, Selangor	Tel : 03-61207601 Fax : 03-61207602
	Pejabat Kesihatan Daerah Petaling 101 - 401, Blok C, Glomac Business Centre, Jalan SS 6/1, Kelana Jaya, 47301 Petaling Jaya, Selangor	Tel : 03-78045333 Fax : 03-78051458
NEGERI SEMBILAN	Jabatan Kesihatan Negeri Sembilan Jalan Rasah 70300 Seremban Negeri Sembilan Darul Khusus	Tel : 06-7664800 Fax : 06-7648613 (Am) / 06-7638543 Web : http://jknns.moh.gov.my
	Pejabat Kesihatan Daerah Seremban Jalan Lee Sam, 70590 Seremban, Negeri Sembilan	Tel : 06-7685400 Fax : 06-7612145
	Pejabat Kesihatan Daerah Kuala Pilah Kuala Pilah, 72000 Kuala Pilah Negeri Sembilan	Tel : 06-4811315 Fax : 06-4818062
	Pejabat Kesihatan Daerah Rembau Jalan Batu Hampar, 71300 Rembau, Negeri Sembilan	Tel : 06-6851141/06-6855872 Fax : 06-6137614

STATE	OFFICE	PHONE / FAX NUMBER
	Pejabat Kesihatan Daerah Port Dickson Port Dickson, 71000 Port Dickson Negeri Sembilan	Tel : 06-6473288 Fax : 06-6473179
	Pejabat Kesihatan Daerah Jelebu Kuala Klawang, Jelebu, Jelebu 71600 Jelebu, Negeri Sembilan	Tel : 06-6136977 Fax : 06-6137614
MELAKA	Jabatan Kesihatan Negeri Melaka Tingkat 3, 4, dan 5, Wisma Persekutuan, Jalan Business City, Bandar MITC 75450 Ayer Keroh, Melaka.	Tel : 06-2356999 Fax : 06-2345969 Web : http://jknmelaka.moh.gov.my
	Pejabat Kesihatan Daerah Melaka Tengah Jalan Bukit Baru, 75150 Melaka	Tel : 06-2822332 / 2823760 Fax : 06-2816219
	Pejabat Kesihatan Daerah Alor Gajah Jalan Hospital, 78000 Alor Gajah, Melaka	Tel : 06-5566235/6237 Fax : 06-5566249
	Pejabat Kesihatan Daerah Jasin 77000 Jasin, Melaka	Tel : 06-5293390 / 5292333 Fax : 06-5292812
JOHOR	Jabatan Kesihatan Negeri Johor Tingkat 3 & 4 Blok B, Wisma Persekutuan, Jalan Air Molek, 80590 Johor Bahru Johor Darul Takzim.	Tel : 072245188/189/190 Fax : 072247361 (Pengurusan), 072232603 (Pejabat Pengarah) Web : http://jknjohor.moh.gov.my
	Pejabat Kesihatan Daerah Johor Bahru Jalan Abdul Samad, 80100 Johor Bharu	Tel : 07-2224711/4818 Fax : 07-2236549
	Pejabat Kesihatan Daerah Muar Jalan Othman, 84000 Muar, Johor	Tel : 06-9522326/296 Fax : 06-9516533/9539204

STATE	OFFICE	PHONE / FAX NUMBER
	Pejabat Kesihatan Daerah Segamat Peti Surat 102, Jalan Gudang Ubat 85000 Segamat, Johor	Tel : 07-9313355 Fax : 07-9321204
	Pejabat Kesihatan Daerah Batu Pahat Jalan Md Khalid, 83000 Batu Pahat, Johor	Tel : 07-4341011/1021 Fax : 07-4322026
	Pejabat Kesihatan Daerah Pontian Jalan Alsagoff 82000 Pontian, Johor	Tel : 07-6862808/6879333 Fax : 07-6873092
	Pejabat Kesihatan Daerah Mersing Jalan Ismail 86800 Mersing, Johor	Tel : 07-7991836 Fax : 07-7994145
	Pejabat Kesihatan Daerah Kota Tinggi Jalan Lombang, 81900 Kota Tinggi, Johor	Tel : 07-8831133/7397 Fax : 07-8831273
	Pejabat Kesihatan Daerah Kluang Jalan Sultanah, 86000 Kluang, Johor	Tel : 07-7721852 Fax : 07-7735526
	Pejabat Kesihatan Daerah Tangkak JKR 2831 Jalan Hospital, 84900 Tangkak, Johor	Tel : 06-9787762 Fax : 06-9787724
	Pejabat Kesihatan Daerah Kulai Batu 19, Jalan Ayer Hitam, 81000 Kulai Johor	Tel : 07-6622403 Fax : 07-6622603
PAHANG	Jabatan Kesihatan Negeri Pahang Jalan IM 4, Bandar indera Mahkota, 25582 Kuantan Pahang Darul Makmur	Tel : 09-570 7999 (pengarah) Fax : 09-570 7799/7798 (pengurusan) Web : http://jknpahang.moh.gov.my

STATE	OFFICE	PHONE / FAX NUMBER
	Pejabat Kesihatan Daerah Kuantan Jalan Tengku Muhammad, Alor Akar 25050 Kuantan, Pahang	Tel : 09-5679031 Fax : 09-5679029
	Pejabat Kesihatan Daerah Pekan 26000 Pekan, Pahang	Tel : 09-4221044 Fax : 09-4223086
	Pejabat Kesihatan Daerah Rompin Jalan Kampung Kolam, 26800 Kuala Rompin, Pahang	Tel : 09-4145164 Fax : 09-4147828
	Pejabat Kesihatan Daerah Maran Aras 3 Wisma Persekutuan 26500 Maran, Pahang Pejabat Kesihatan Daerah Temerloh Jalan Tun Ismail, 28000 Temerloh, Pahang	Tel : 09-4771346 Fax : 09-4771216 Tel : 09-2961800 Fax : 09-2964885
	Pejabat Kesihatan Daerah Bera Tingkat 1, Klinik Kesihatan Padang Luas 28200 Bandar Bera, Pahang	Tel : 09-2552043/2063 Fax : 09-2552044
	Pejabat Kesihatan Daerah Jerantut 27000 Jerantut, Pahang	Tel : 09-2662218 Fax : 09-2665430
	Pejabat Kesihatan Daerah Kuala Lipis Jalan Benta, 27200 Kuala Lipis, Pahang	Tel : 09-3101070/43 Fax : 09-3122685
	Pejabat Kesihatan Daerah Raub 27600 Raub, Pahang	Tel : 09-3552355 Fax : 09-3556639
	Pejabat Kesihatan Daerah Bentong 27800 Bentong, Pahang	Tel : 09-2221220 Fax : 09-2220461

STATE	OFFICE	PHONE / FAX NUMBER
	Pejabat Kesihatan Daerah Cameron Highlands 39000 Tanah Rata, Cameron Highlands, Pahang	Tel : 05-4911966 Fax : 05-4914355
KELANTAN	Jabatan Kesihatan Negeri Kelantan Tingkat 5, Wisma Persekutuan, 15590 Kota Baharu, Kelantan Darul Naim.	Tel : 09-7413300 Fax : 09-7441333 Web : http://jknkelantan.moh.gov.my
	Pejabat Kesihatan Daerah Kota Bharu Jalan Doktor, 15000, Kota Bharu, Kelantan	Tel : 09-7414800/4801 Fax : 09-7448559
	Pejabat Kesihatan Daerah Pasir Mas Jalan Hospital Lati, 17000 Pasir Mas, Kelantan	Tel : 09-7908333 Fax : 09-7912601
	Pejabat Kesihatan Daerah Tanah Merah 17500 Tanah Merah, Kelantan	Tel : 09-9556333/8333 Fax : 09-9556533
	Pejabat Kesihatan Daerah Pasir Puteh Lot 644 Tingkat Bawah Bangunan Sentosa Jaya, 16800 Pasir Puteh, Kelantan	Tel : 09-7866157 Fax : 09-7867488
	Pejabat Kesihatan Daerah Machang 18500 Machang, Kelantan	Tel : 09-975 0400 / 09-975 0401 Fax : 09-975 3578
	Pejabat Kesihatan Daerah Tumpat 16200 Tumpat, Kelantan	Tel : 09-7255000 Fax : 09-7258730
	Pejabat Kesihatan Daerah Bachok 16300 Bachok, Kelantan	Tel : 09-7788333/7782826 Fax : 09-7788680

STATE	OFFICE	PHONE / FAX NUMBER
	Pejabat Kesihatan Daerah Kuala Krai 18000 Kuala Krai, Kelantan	Tel : 09-9666066 Fax : 09-9663303
	Pejabat Kesihatan Daerah Gua Musang Aras 2, Bangunan Persekutuan 18300 Gua Musang, Kelantan	Tel : 09-9120610 Fax : 09-9121009
	Pejabat Kesihatan Daerah Jeli 17600 Jeli, Kelantan	Tel : 09-9440333/9441033 Fax : 09-9440275
TERENGGANU	Jabatan Kesihatan Negeri Terengganu Tingkat 5, Wisma Persekutuan Jalan Sultan Ismail 20920 Kuala Terengganu, Terengganu Darul Iman.	Tel : 09-6222866 Fax : 09-6245829 / 8367 Web : http://jknterengganu.moh.gov.my
	Pejabat Kesihatan Daerah Kuala Terengganu Lot 994, Tingkat Bawah & 1 Bangunan Wisma Peladang, Jalan Sultan Mohamad 21100 Kuala Terengganu, Terengganu	Tel : 09-6223355/6224594 Fax : 09-6312605
	Pejabat Kesihatan Daerah Kemaman 24000 Kemaman, Terengganu	Tel : 09-8591330 Fax : 09-8593430
	Pejabat Kesihatan Daerah Dungun Jalan Yahya Ahmad, Dungun 23000 Dungun, Terengganu	Tel : 09-8422100/09-8422101 Fax : 09-8458768
	Pejabat Kesihatan Daerah Marang Sungai Kerak, Jalan Wakaf Tapai, Marang 21600 Marang, Terengganu	Tel : 09-6182545 Fax : 09-6183984

STATE	OFFICE	PHONE / FAX NUMBER
	Pejabat Kesihatan Daerah Hulu Terengganu Kuala Berang, Hulu Terengganu 21700 Kuala Berang, Terengganu	Tel : 09-6812333/ 6811118 Fax : 09-6812191
	Pejabat Kesihatan Daerah Setiu Kg. Tok Majid, Bandar Permaisuri Setiu, 22100 Setiu, Terengganu	Tel : 096092395 / 096092394 Fax : 096092387
	Pejabat Kesihatan Daerah Besut Jalan Keluang, Kampung Raja Besut 22200 Kampung Raja Besut, Terengganu	Tel : 09-6958700 Fax : 09-6958699
SARAWAK	Jabatan Kesihatan Negeri Sarawak Jalan Diplomatik, Off Jalan Bako, 93050 Kuching, Sarawak.	Tel : 082-473200 Fax : 082 - 443031 Web : http://jknsarawak.moh.gov.my
BAHAGIAN KUCHING	Pejabat Kesihatan Daerah Kuching Bahagian Kuching, Jalan Tun Ahmad Zaidi Adruce, 93250 Kuching, Sarawak	Tel : 082-226414 / 238635 Fax : 082-414542
	Pejabat Kesihatan Daerah Bau Jalan Bau - Lundu, 94000 Bau, Sarawak	Tel : 082-763116 Fax : 082-763716
	Pejabat Kesihatan Daerah Lundu Daerah Lundu, Jalan Sekambal, 94500 Lundu, Sarawak	Tel : 082-735311/082-735108 Fax : 082-735055/734652
BAHAGIAN SAMARAHAN	Pejabat Kesihatan Daerah Kota Samarahan Jalan Datuk Muhammad Musa, Samarahan, 94300 Kota Samarahan, Sarawak	Tel : 082-673626/ 082-673627 /082-673628/ 0820673629 Fax : 082-673632

STATE	OFFICE	PHONE / FAX NUMBER
	Pejabat Kesihatan Daerah Pakan Klinik Kesihatan Pakan, 96150 Pakan,sarawak	Tel : 084-717225
	Pejabat Kesihatan Daerah Serian Jalan Serian Bypass, 94700 Serian, Sarawak	Tel : 082-874311/082-872693 Fax : 082-875182
	Pejabat Kesihatan Daerah Simunjan, Jalan Sabun, 94800 Simunjan, Sarawak	Tel : 082-803614 Fax : 082-803823
BAHAGIAN SRI AMAN	Pejabat Kesihatan Bahagian/ Daerah Sri Aman Bahagian Sri Aman, Jalan Hospital, 95007 Sri Aman, Sarawak	Tel : 083-322176 / 083-322058 Fax : 083-323220
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MINISTRY OF HEALTH
MALAYSIA

Published by :
Disease Control Division &
with collaboration
Health Education Division
Ministry of Health Malaysia

terbitan 2017