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.

Goal

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 epidemiologic 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 undertaken 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**

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<th>VPD &amp; FWBD Sector</th>
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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
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Tel: 03 – 8883 4421 / 4504
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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


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 | Tel: 03-8883 4262 |
| Disease Control Division | Fax: 03-8883 4285 |
| Ministry of Health | 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**

**Contact Information**

**Zoonosis Sector**
**Disease Control Division**
**Ministry of Health**

Tel: 03-88834420
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**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).

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Ministry of Health

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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

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.

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HIV/STI/Hepatitis C Sector
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E-mail: cprc@moh.gov.my
**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**

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<th>VPD &amp; FWBD Sector</th>
<th>Tel: 03 – 8883 4421 / 4503</th>
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</thead>
<tbody>
<tr>
<td>Disease Control Division</td>
<td>Fax: 03 – 8888 6270</td>
</tr>
<tr>
<td>Ministry of Health</td>
<td>E-mail: <a href="mailto:cprc@moh.gov.my">cprc@moh.gov.my</a></td>
</tr>
</tbody>
</table>
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, Coxsackie virus 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

Tel: 03-8883 4262
Fax: 03-8883 4285
E-mail: cprc@moh.gov.my
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
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
Fax: 03 – 8888 6251 / 6215
E-mail: cprc@moh.gov.my
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  
Disease Control Division  
Ministry of Health  
Tel: 03 – 8883 4421 / 4504  
Fax: 03 – 8888 6270  
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 | Tel: 03 – 8883 4421 / 4503 |
| Disease Control Division | Fax: 03 – 8888 6270 |
| Ministry of Health | E-mail: cprc@moh.gov.my |
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 factor 1 within the 21 days before the onset of symptoms.

1 Epidemiological Risk Factors to Consider When Evaluating a Person for Exposure to Ebola Virus:

A. High Risk includes any of the following:

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

- 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;  
- 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:

- 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:

<table>
<thead>
<tr>
<th>Widespread transmission</th>
<th>Affected areas</th>
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<tbody>
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<td>No countries currently in this classification</td>
<td>None</td>
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<thead>
<tr>
<th>Countries with former widespread transmission and current, established control measures²</th>
<th>Affected areas</th>
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<tbody>
<tr>
<td>Liberia</td>
<td>Entire country</td>
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<tr>
<td>Sierra Leone</td>
<td>Entire country</td>
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<tr>
<td>Guinea</td>
<td>Entire country</td>
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<table>
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<tr>
<th>Cases in urban settings with uncertain control measures³</th>
<th>Affected areas</th>
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<tbody>
<tr>
<td>No countries currently in this classification</td>
<td>None</td>
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<table>
<thead>
<tr>
<th>Cases in urban settings with effective control measures</th>
<th>Affected areas</th>
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<tbody>
<tr>
<td>No countries currently in this classification</td>
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</table>

<table>
<thead>
<tr>
<th>Previously affected countries⁴</th>
<th>Affected areas</th>
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<tbody>
<tr>
<td>Nigeria</td>
<td>Lagos, Port Harcourt</td>
</tr>
<tr>
<td>Senegal</td>
<td>Dakar</td>
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<tr>
<td>Spain</td>
<td>Madrid</td>
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<tr>
<td>United States</td>
<td>Dallas, New York City</td>
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<tr>
<td>Mali</td>
<td>Bamako</td>
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<tr>
<td>United Kingdom</td>
<td>Scotland, England</td>
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<tr>
<td>Italy</td>
<td>Sardinia</td>
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</table>
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.

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.

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:

- The National CPRC, Disease Control Division, and
- The respective State Health Department; and
- 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

**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
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

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</table>
GONOCOCCAL INFECTIONS
(ICD 10: A 54.9)

Case Definition

Clinical case definition
A sexually transmitted infection commonly manifested by urethritis, cervicitis, or salpingitis. 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

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
Fax: 03-8883 4285
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

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

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

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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 > 6 months.

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

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<tr>
<td>Ministry of Health</td>
<td>E-mail: <a href="mailto:cprc@moh.gov.my">cprc@moh.gov.my</a></td>
</tr>
</tbody>
</table>
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

Tel: 03-8883 4262
Fax: 03-8883 4285
E-mail:cprc@moh.gov.my
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 |
| Ministry of Health | E-mail: cprc@moh.gov.my |
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**

**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 | Tel: 03-88834141/03-88834119 |
| Coordinator                       | Fax: 03-88810400 / 03-88810500 |
| Disease Surveillance Section      | E-mail: ili_survelan@moh.gov.my |
| Disease Control Division          |                           |
| Ministry of Health                |                           |
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
**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 ≥1 peripheral 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 hypopigmented and hypoaesthetic skin lesions (< 6)

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


**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**

<table>
<thead>
<tr>
<th>TB/Leprosy Sector</th>
<th>Tel: 03 – 8883 4507</th>
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<tbody>
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<td>Fax: 03 – 8888 6270</td>
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<td>Ministry of Health</td>
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</tbody>
</table>
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

Contact Information

Zoonosis Sector
Disease Control Division
Ministry of Health

Tel: 03-88834420
Fax: 03-88891013
Email: zoonosis@moh.gov.my
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 (haemoglobinemia), hypoglycaemia, lactic acidosis, septicaemia, disseminated intravascular coagulation (DIC), 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

- 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
Fax: 03 – 8888 6251 / 6215
E-mail: cprc@moh.gov.my
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 & FWB Division
Disease Control Division
Ministry of Health

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

**Contact Information**

| Zoonosis Sector  |
| Disease Control Division |
| Ministry of Health |

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

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

\(^2\) 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 are associated with a specific setting, such as a classroom, workplace, household, extended family, hospital, other residential institution, military barracks or recreational camp.

Probable case of MERS
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 specimen\(^3\);
AND
The patient has a direct epidemiologic-link\(^4\) 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 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 Zahira, 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

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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E-mail: cprc@moh.gov.my
**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.

**Reference Laboratory:**
NPHL.

**Contact Information**

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<tr>
<th>VPD &amp; FWBD Sector</th>
<th>Tel: 03 – 8883 4421 / 4504</th>
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<tbody>
<tr>
<td>Disease Control Division</td>
<td>Fax: 03 – 8888 6270</td>
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<tr>
<td>Ministry of Health</td>
<td>E-mail: <a href="mailto:cprc@moh.gov.my">cprc@moh.gov.my</a></td>
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</tbody>
</table>
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

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</tbody>
</table>
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
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
Disease Control Division
Ministry of Health
Tel: 03 – 8883 4421 / 4504
Fax: 03 – 8888 6270
E-mail: cprc@moh.gov.my
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

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
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

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
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

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 required to be maintained during outbreaks in view of number 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

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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
- meningoencephalitis
- 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
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
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.

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**

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• 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**

<table>
<thead>
<tr>
<th>Surveillance Sector</th>
<th>Disease Control Division</th>
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<tbody>
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</table>
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. Congential 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: opro@moh.gov.my
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**

**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**

<table>
<thead>
<tr>
<th><strong>TB/Leprosy Sector</strong></th>
<th><strong>Disease Control Division</strong></th>
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<tbody>
<tr>
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<td>E-mail:<a href="mailto:cprc@moh.gov.my">cprc@moh.gov.my</a></td>
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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 fingerprinting for molecular epidemiologic surveillance.

**Contact Information**

<table>
<thead>
<tr>
<th><strong>VPD &amp; FWBD Sector</strong></th>
<th><strong>Disease Control Division</strong></th>
<th><strong>Ministry of Health</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tel: 03 – 8883 4421 / 4503</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fax: 03 – 8888 6270</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-mail: <a href="mailto:cprc@moh.gov.my">cprc@moh.gov.my</a></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**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 tsutsugamushi”* 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**

**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
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


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

<table>
<thead>
<tr>
<th>A. MAKLUMAT PESAKIT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nama Perlu (HURUF BESAR):</td>
<td></td>
</tr>
<tr>
<td>Name Penging (Dis/Bapa/Penjaga): (Jika belum mengetahui asal pengembalian di)</td>
<td></td>
</tr>
<tr>
<td>2. No. Kad Pengenalan/ Dokumen Penentuan: (Untuk Bukan Warganegara)</td>
<td></td>
</tr>
<tr>
<td>Darah:</td>
<td></td>
</tr>
<tr>
<td>Name Wad:</td>
<td></td>
</tr>
<tr>
<td>Tarikh Masuk Wad:</td>
<td></td>
</tr>
<tr>
<td>3. Kewarganegaraan:</td>
<td></td>
</tr>
<tr>
<td>Wangi negara:</td>
<td></td>
</tr>
<tr>
<td>Keputusan:</td>
<td></td>
</tr>
<tr>
<td>4. Jantina:</td>
<td></td>
</tr>
<tr>
<td>Lelaki</td>
<td></td>
</tr>
<tr>
<td>Perempuan</td>
<td></td>
</tr>
<tr>
<td>5. Tarikh Lahir:</td>
<td></td>
</tr>
<tr>
<td>6. Umur:</td>
<td></td>
</tr>
<tr>
<td>Tahun</td>
<td></td>
</tr>
<tr>
<td>Bulan</td>
<td></td>
</tr>
<tr>
<td>Hari</td>
<td></td>
</tr>
<tr>
<td>7. Pekerjaan:</td>
<td></td>
</tr>
<tr>
<td>(Jika tidak bekerja, masukan status di:</td>
<td></td>
</tr>
<tr>
<td>8. No. Telefon:</td>
<td></td>
</tr>
<tr>
<td>(Untuk Perubahan):</td>
<td></td>
</tr>
<tr>
<td>9. Alamat Kediaman:</td>
<td></td>
</tr>
<tr>
<td>10. Alamat Tempat Kerja / Belajar:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. DIAGNOSIS PENYAKIT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Poliomyelitis:</td>
<td></td>
</tr>
<tr>
<td>2. Viral Hepatitis A:</td>
<td></td>
</tr>
<tr>
<td>3. Viral Hepatitis B:</td>
<td></td>
</tr>
<tr>
<td>4. Viral Hepatitis C:</td>
<td></td>
</tr>
<tr>
<td>5. Viral Hepatitis - Others:</td>
<td></td>
</tr>
<tr>
<td>6. AIDS:</td>
<td></td>
</tr>
<tr>
<td>7. Chancroid:</td>
<td></td>
</tr>
<tr>
<td>8. Odoles:</td>
<td></td>
</tr>
<tr>
<td>9. Dengue Fever:</td>
<td></td>
</tr>
<tr>
<td>10. Dengue Haemorrhagic Fever:</td>
<td></td>
</tr>
<tr>
<td>11. Diphtheria:</td>
<td></td>
</tr>
<tr>
<td>12. Dorsyter:</td>
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</tr>
<tr>
<td>13. Ebola:</td>
<td></td>
</tr>
<tr>
<td>14. Food Poisoning:</td>
<td></td>
</tr>
<tr>
<td>15. Gonorrhea:</td>
<td></td>
</tr>
<tr>
<td>16. Hand, Foot and Mouth Disease:</td>
<td></td>
</tr>
<tr>
<td>17. Human Immunodeficiency Virus Infection:</td>
<td></td>
</tr>
<tr>
<td>18. Influenza:</td>
<td></td>
</tr>
<tr>
<td>19. Leprosy (Multibacillary):</td>
<td></td>
</tr>
<tr>
<td>20. Leprosy (Paucibacillary):</td>
<td></td>
</tr>
<tr>
<td>21. Leptospirosis:</td>
<td></td>
</tr>
<tr>
<td>22. Malaria - Slo:</td>
<td></td>
</tr>
<tr>
<td>23. Malaria - Faluax:</td>
<td></td>
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<tr>
<td>24. Malaria - Nalain:</td>
<td></td>
</tr>
<tr>
<td>25. Malaria - Others:</td>
<td></td>
</tr>
<tr>
<td>26. Meningitis:</td>
<td></td>
</tr>
<tr>
<td>27. Plague:</td>
<td></td>
</tr>
<tr>
<td>28. Rabies:</td>
<td></td>
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<tr>
<td>29. Rabies:</td>
<td></td>
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<tr>
<td>30. Rabies:</td>
<td></td>
</tr>
<tr>
<td>31. Sifilis - Acquired:</td>
<td></td>
</tr>
<tr>
<td>32. Tetanus Neonatorum:</td>
<td></td>
</tr>
<tr>
<td>33. Tetanus - Others:</td>
<td></td>
</tr>
<tr>
<td>34. Typhoid - Scar:</td>
<td></td>
</tr>
<tr>
<td>35. Tuberculosis - PTB Smear Positive:</td>
<td></td>
</tr>
<tr>
<td>36. Tuberculosis - PTB Smear Negative:</td>
<td></td>
</tr>
<tr>
<td>37. Tuberculosis - Extra Pulmonary:</td>
<td></td>
</tr>
<tr>
<td>38. Typhoid - Salmonella typhi:</td>
<td></td>
</tr>
<tr>
<td>39. Typhoid - Salmonella typhi:</td>
<td></td>
</tr>
<tr>
<td>40. Viral Encephalitis - Japanese:</td>
<td></td>
</tr>
<tr>
<td>41. Viral Encephalitis - Others:</td>
<td></td>
</tr>
<tr>
<td>42. Viral Encephalitis - Others:</td>
<td></td>
</tr>
<tr>
<td>43. Whooping Cough / Pertussis:</td>
<td></td>
</tr>
<tr>
<td>44. Yellow Fever:</td>
<td></td>
</tr>
<tr>
<td>45. Lain-lain:</td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>C. MAKLUMAT PEMERBITAHU</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>19. Nama Pengenal Penubatan:</td>
<td></td>
</tr>
<tr>
<td>20. No. Hospital / Klinik dan Alamat:</td>
<td></td>
</tr>
<tr>
<td>21. Tarikh Notifikasi:</td>
<td></td>
</tr>
</tbody>
</table>

Tandaan

Pengenal Penubatan
Appendix 2: Notification form for SARS cases

NOTIFICATION FORM
FOR SEVERE ACUTE RESPIRATORY SYNDROME (SARS)

Ministry Of Health Malaysia
Disease Control Division

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

<table>
<thead>
<tr>
<th>1. Reporting Centre</th>
<th>Name of Hospital:</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone:</td>
<td>Fax:</td>
<td>E-mail:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Information of Patient</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td>Age:</td>
</tr>
<tr>
<td></td>
<td>Sex: ( ) Male ( ) Female</td>
</tr>
<tr>
<td>Address:</td>
<td>Phone(Home):</td>
</tr>
<tr>
<td></td>
<td>RN No:</td>
</tr>
<tr>
<td></td>
<td>H/Phone:</td>
</tr>
<tr>
<td>Nationality:</td>
<td>IC No:</td>
</tr>
<tr>
<td>( ) Malaysian</td>
<td>Passport No:</td>
</tr>
<tr>
<td>( ) Non Malaysian</td>
<td></td>
</tr>
<tr>
<td>Country of Origin:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Signs and Symptoms</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>( ) Yes ( ) No</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Chest X-ray finding</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>( ) Yes ( ) No</td>
<td></td>
</tr>
</tbody>
</table>

| 5. Is there any alternative diagnosis that can fully explain patient’s illness? | ( ) Yes ( ) No |

<table>
<thead>
<tr>
<th>6. Clinical states at time of report</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Was patient hospitalized?</td>
<td>Ward:</td>
</tr>
<tr>
<td>( ) Yes, Date:</td>
<td>Ward:</td>
</tr>
<tr>
<td></td>
<td>( ) Isolation ward</td>
</tr>
<tr>
<td></td>
<td>( ) On treatment</td>
</tr>
<tr>
<td>( ) Brought in Dead (BID)</td>
<td>Date:</td>
</tr>
<tr>
<td></td>
<td>( ) General ward</td>
</tr>
<tr>
<td></td>
<td>( ) Died</td>
</tr>
<tr>
<td></td>
<td>( ) ICU</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7. Exposure History</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicate if the patient was in close contact with SARS case:</td>
<td>( ) Yes ( ) No</td>
</tr>
<tr>
<td>Name:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8. Travel History</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Has the patient travelled to any of the following destinations within 10 days prior to onset of symptoms</td>
<td>( ) Yes ( ) No</td>
</tr>
<tr>
<td>Country/State/province visited</td>
<td>Duration of stay</td>
</tr>
<tr>
<td></td>
<td>from[dd/mm/yy]</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Date of return to Malaysia:</td>
<td>Entry point:</td>
</tr>
<tr>
<td>9. Diagnostic Evaluation</td>
<td></td>
</tr>
<tr>
<td>Date taken:</td>
<td>Date sent to IMR:</td>
</tr>
<tr>
<td></td>
<td>Result:</td>
</tr>
<tr>
<td>10. Working diagnosis (Please state)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11. Contact tracing (to be filled by District Health Officer)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Has contact tracing been initiated?</td>
<td>( ) Yes ( ) No</td>
</tr>
<tr>
<td>Number of contacts:</td>
<td></td>
</tr>
<tr>
<td>No. on house quarantine:</td>
<td>No. on active surveillance:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>12. Reporting Officer:</th>
<th>Signature:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designation:</td>
<td>Date:</td>
</tr>
<tr>
<td></td>
<td>H/Phone No:</td>
</tr>
</tbody>
</table>

For Disease Control Division use only

SARS
Not SARS

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*
<table>
<thead>
<tr>
<th>STATE</th>
<th>OFFICE</th>
<th>PHONE / FAX NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERLIS</td>
<td>Jabatan Kesihatan Negeri Perlis</td>
<td>Tel : 04-9773333</td>
</tr>
<tr>
<td></td>
<td>Jalan Raja Syed Alwi, 01000 Kangar, Perlis</td>
<td>Fax : 04-9760764/9774855</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Web: <a href="http://jknperlis.moh.gov.my">http://jknperlis.moh.gov.my</a></td>
</tr>
<tr>
<td></td>
<td>Pejabat Kesihatan Daerah Kangar</td>
<td>Tel : 04-9761388</td>
</tr>
<tr>
<td></td>
<td>Jalan Abi Tok Hashim, 01000 Kangar, Perlis</td>
<td>Fax : 04-9774517</td>
</tr>
<tr>
<td>KEDAH</td>
<td>Jabatan Kesihatan Negeri Kedah</td>
<td>Tel : 04-7741000</td>
</tr>
<tr>
<td></td>
<td>Jalan Kuala Kedah, 05400 Simpang Kuala, Kedah Darul Aman</td>
<td>Fax : 04-7741005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Web: <a href="http://jknkedah.moh.gov.my">http://jknkedah.moh.gov.my</a></td>
</tr>
<tr>
<td></td>
<td>Pejabat Kesihatan Daerah Langkawi</td>
<td>Tel : 04-9667141</td>
</tr>
<tr>
<td></td>
<td>Tingkat 6 Kompleks LADA Langkawi, Kedah, 07000 Kuah, Kedah</td>
<td>Fax : 04-9669034</td>
</tr>
<tr>
<td></td>
<td>Pejabat Kesihatan Daerah Kubang Pasu, Jitra Kubang Pasu, 06000 Jitra, Kedah</td>
<td>Tel : 04-9171355</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fax : 04-9178644</td>
</tr>
<tr>
<td></td>
<td>Pejabat Kesihatan Daerah Kota Setar</td>
<td>Tel : 04-7332775</td>
</tr>
<tr>
<td></td>
<td>Blok A, Aras 1, Hospital Alor Setar (Hospital Lama) Alor Setar Lebuhraya Darulaman, Kedah, 05100 Alor Setar, Kedah</td>
<td>Fax : 04-7347295</td>
</tr>
<tr>
<td></td>
<td>Pejabat Kesihatan Daerah Kuala Muda</td>
<td>Tel : 04-4213355</td>
</tr>
<tr>
<td></td>
<td>Jalan Badlishah, 08000 Sungai Petani, Kedah</td>
<td>Fax : 04-4210076</td>
</tr>
<tr>
<td></td>
<td>Pejabat Kesihatan Daerah Padang Terap, 06300 Kuala Nerang, Kedah</td>
<td>Tel : 04-7866094</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fax : 04-7864722</td>
</tr>
<tr>
<td>STATE</td>
<td>OFFICE</td>
<td>PHONE / FAX NUMBER</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Pejabat Kesihatan Daerah Baling</td>
<td>Tel: 04-4701351 Fax: 04-4701131</td>
<td></td>
</tr>
<tr>
<td>Jln Weng, 09100 Baling, Kedah</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pejabat Kesihatan Daerah Kulim</td>
<td>Tel: 04-4949000 Fax: 04-4911843</td>
<td></td>
</tr>
<tr>
<td>Jalan Tasik, 09000 Kulim, Kedah</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pejabat Kesihatan Bandar Baharu Serdang, Kedah</td>
<td>Tel: 04-4079446/4079448 Fax: 04-4079611</td>
<td></td>
</tr>
<tr>
<td>09800 Bandar Bharu, Kedah</td>
<td></td>
<td></td>
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Fax : 03-87872054 |
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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 |
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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  
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<td>Tel : 09-6222866  Fax : 09-6245829 / 8367  Web : <a href="http://jknterengganu.moh.gov.my">http://jknterengganu.moh.gov.my</a></td>
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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  
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<td><strong>Pejabat Kesihatan Kawasan Tawau</strong></td>
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### Appendix 4

**REFERENCE LABORATORIES CONTACT INFORMATION**

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Appendix 5

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