FOREWORD

Leptospirosis occurs worldwide and can be a serious public health issue in a humid tropical and subtropical country such as Malaysia. Although leptospirosis cases have been reported in Malaysia since the 1920s, the actual disease burden in the country is unknown due to it not being a notifiable disease under the Prevention and Control of Communicable Diseases Act 1988 until recently.

Leptospirosis is also known as “the Great Mimicker” and may be overlooked and underdiagnosed due to its varied clinical presentations. It is important for our healthcare personnel to recognize the various presentations and thus take the opportunity to provide early treatment with the appropriate antibiotics to patients and prevent complications.

I would like to commend the Zoonosis Sector for bringing together a multidisciplinary group of health professionals in developing this guideline which will serve as a guiding tool in creating awareness and assisting healthcare personnel in the diagnosis, management, prevention and control of leptospirosis in Malaysia.

I also encourage constructive comments and feedback from the implementers at all levels to further improve this guideline in order to control this disease in the most effective, coordinated and organized manner.

Dr. Lokman Hakim B. Sulaiman

Director of Disease Control

Ministry of Health, Malaysia

2011
ADVISORS

Dato’ Dr. Hasan Abdul Rahman
Deputy Director General of Health (Public Health)

Dr. Lokman Hakim B. Sulaiman
Director of Disease Control

CHIEF EDITOR

Dr. Khebir bin Verasahib
Head of Zoonosis Sector

EDITORIAL BOARD

Dr. Husna Maizura Bt. Ahmad Mahir

Cik Ong Chia Ching

Tn Hj. Abdul Jamil B. Ali
CONTRIBUTORS

Disease Control Division
Dr. Khebir B. Verasahib
Dr. Sha’ari B. Ngadiman
Dr. Hj. Daud Abdul Rahim
Dr. Balachandran A/L Satiamurti
Dr. Rosemawati Bt. Ariffin
Dr. Husna Maizura Bt. Ahmad Mahar
Dr. Junaid B. Djoharnis
Dr. Muhammad B. Ismail
Tn Hj. Abdul Hamid B. Osman
Cik Ong Chia Ching
Tn Haji Wagimon B. Amat
Tn Hj. Abdul Jamil B. Ali

Dr. Noraini Bt Ismail
Hospital Sultanah Bahiyah, Alor Setar

Dr. Chow Ting Soo
Hospital Pulau Pinang

Dr. Kan Foong Kee
Hospital Sultanah Aminah, Johor Bahru

Encik Alex Francis
Hospital Raja Permaisuri Bainun, Ipoh

Dr. Zulhizzam B. Hj. Abdullah
Perlis State Health Department

National Institutes of Health
Institut of Medical Research
Dr. Norazah Bt. Ahmad
Dr Fairuz Amran

National Public Health Laboratory
En. Khairul Azan B. Hashim

Medical Development Division
Dr. Inderjeet Kaur Gill

Family Health Development Division
Dr. Aizuniza Abdullah

Planning and Development Division
En. Ahmad Jessren Kamaruddin
Dr. Fathullah Iqbal Ab. Rahim

Engineering Services Division
En. Nazi B. Salleh
Siti Asma Bakar

Health Education Division
En. Sasitheran K.Nair

Hospital Kuala Lumpur
Dr. Kamarul Azahar Mohd Razali,

State Health Departments
Dr. Benedict Sim Lim Heng
Hospital Sg. Buloh

Dr. Noraini Bt Ismail
Hospital Sultanah Bahiyah, Alor Setar

Dr. Chow Ting Soo
Hospital Pulau Pinang

Dr. Kan Foong Kee
Hospital Sultanah Aminah, Johor Bahru

Encik Alex Francis
Hospital Raja Permaisuri Bainun, Ipoh

Dr. Zulhizzam B. Hj. Abdullah
Perlis State Health Department

Dr Uma Salmah Bt. Abd. Kadir
Dr. Shareh Azizan Shareh Ali
Kedah State Health Department

Dr. Saraswathi Bina Rai
Pulau Pinang State Health Department

Dr. Puvaneswari a/p Subramaniam
Perak State Health Department

Dr. Anita Bt. Sulaiman
Selangor State Health Department

Dr. Maznieda Bt. Mahjom
WP Kuala Lumpur State Health Department

Dr. Hamizar Iqbal B. Abdul Halim
Negeri Sembilan State Health Department

Dr. Hashimah Bt. Hassan
Melaka State Health Department

Dr. Zuraidah Bt. Mokhtar
Johor State Health Department

Dr. Hj. Mohamed Sapian B. Mohamed
Pahang State Health Department

To' Puan Dr. Rahmah Bt. Elias
Terengganu State Health Department

Dr. Suhaiza Bt. Sulaiman
Kelantan State Health Department

Dr. Maria Bt. Suleiman
Sabah State Health Department
Table of Contents

Foreword

1. Introduction

2. Epidemiology

3. Factors Responsible For The Emergence Of Leptospirosis

4. Modes of Transmission

5. High Risk Groups

6. Clinical Manifestations

7. Case Classifications
   7.1 Suspected case
   7.2 Probable case
   7.3 Confirmed case

8. Notification

9. Treatment

10. Prophylaxis

11. Surveillance
   11.1 Hospital Based Surveillance
   11.2 Serosurveillance (Laboratory Based Surveillance)
   11.3 Active Surveillance

12. Outbreak Response

13. Prevention and Control

14. References
## List Of Annex

<table>
<thead>
<tr>
<th>Annex</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annex 1</td>
<td>Collection and Transportation of Sample (Clinical &amp; Environmental) and Criteria for Water Sampling</td>
</tr>
<tr>
<td></td>
<td>1a - Laboratory Request Form from IMR</td>
</tr>
<tr>
<td></td>
<td>1b - Laboratory Request Form from MKAK (MKAK-BPUI-U01)</td>
</tr>
<tr>
<td></td>
<td>1c - Laboratory Request Form from MKAK (MKAK-PER-104B-02/1)</td>
</tr>
<tr>
<td>Annex 2a</td>
<td>Rev/2010 Form (Notification Form) in National Language</td>
</tr>
<tr>
<td>Annex 2b</td>
<td>Rev/2010 Form (Notification Form) in English</td>
</tr>
<tr>
<td>Annex 3</td>
<td><em>Leptospirosis</em> Case Investigation Form</td>
</tr>
<tr>
<td>Annex 4</td>
<td>Example of <em>Leptospirosis</em> database format</td>
</tr>
<tr>
<td>Annex 5</td>
<td>Outbreaks Preliminary Report BKP/WABAK/01/2005</td>
</tr>
<tr>
<td>Annex 6</td>
<td>Flow Chart of Notification of cases/outbreak</td>
</tr>
<tr>
<td>Annex 7a</td>
<td>Example of Risk Assessment Form (Man made Recreational Park)</td>
</tr>
<tr>
<td>Annex 7b</td>
<td>Example of Risk Assessment Form (Natural Recreational Park)</td>
</tr>
<tr>
<td>Annex 8a</td>
<td>Example of Health Hazard Signage In National Language</td>
</tr>
<tr>
<td>Annex 8b</td>
<td>Example of Health Hazard Signage In English</td>
</tr>
</tbody>
</table>
1. INTRODUCTION

Leptospirosis is a common public health problem worldwide with an estimated annual incidence ranging from 0.1 to 1 per 100,000 per year in temperate climates to 10 or more per 100,000 per year in the humid tropics (1). The estimated case-fatality rates in different parts of the world have been reported to range from <5% to 30% (1). These figures however are probably grossly underestimated because in many countries especially those where the disease is highly endemic, diagnostic capabilities are not readily available resulting in significantly poor surveillance and reporting of leptospirosis (2).

Leptospirosis is an infectious disease with broad range of clinical manifestations, ranging from mild flu-like illness to very severe disease with hemorrhagic manifestations and multiorgan failures. Severe leptospirosis commonly resulted in case fatalities if aggressive managements are not instituted at an early stage (1).

In Malaysia, an increasing number of reported cases and outbreaks which had resulted in significant number of deaths have been observed over the past decade. There is a great need for improvement in case surveillance, in order to define strategies in control and prevention of case morbidity and mortality related to this disease. Thus, under the Prevention and Control of Infectious Diseases Act 1988 leptospirosis has been gazetted as a notifiable disease on 9 December 2010.

This guideline is drawn up through joint efforts of various Ministry of Health experts to provide information on the disease and guides on diagnostic criteria, management of diagnostic samples and notification procedures.

The aims of this guideline include:

- To increase awareness among the healthcare personnel on the importance of leptospirosis.
- To guide in diagnostic procedures in order to obtain early diagnosis so that prompt and appropriate management can be instituted and prevention and control measures can be carried out at the earliest possible stage to reduce morbidity and mortality.
- To quantify and monitor leptospirosis disease burden and its distribution throughout the country.
- To obtain good epidemiological and clinical data on leptospirosis which is important for improving strategies in prevention and control of the disease.
2. EPIDEMIOLOGY

Leptospirosis is an infectious disease caused by pathogenic spirochete bacteria of the genus leptospira that are transmitted directly or indirectly from animals to human (i.e., a zoonotic disease). Pathogenic leptospires belong to the species *Leptospira interrogans*, which is subdivided into more than 200 serovars with 25 serogroups (3). The leptospiral serovars are naturally carried in the renal tubules of rodents, wild and domestic animals.

Leptospirosis is usually a seasonal disease that starts at the onset of the rainy season and declines as the rainfall recedes. Sporadic cases may occur throughout the year with outbreaks associated with extreme changing weather events such as heavy rainfall and flooding (2).

The incidence of Leptospirosis was not well documented in Malaysia due to it not being a notifiable disease, previously. Currently available leptospirosis country data for Malaysia is based on the Report of Morbidity and Mortality for Ministry of Health Hospitals. Since these cases were from hospital records, it is not known whether they were sporadic cases or related to clusters (epidemiological link).
Table 1 showed an apparent increase in leptospirosis cases which could be due to several reasons such as an actual rise in the number of cases, increased awareness and diagnosis, reporting, and laboratory capacity.

Table 1: CASES OF LEPTOSPIROSIS IN MINISTRY OF HEALTH HOSPITALS, MALAYSIA FROM YEAR 2004 TO 2009

<table>
<thead>
<tr>
<th>No</th>
<th>State</th>
<th>Year 2004</th>
<th>Year 2005</th>
<th>Year 2006</th>
<th>Year 2007</th>
<th>Year 2008</th>
<th>Year 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Perak</td>
<td>29 (4)</td>
<td>71 (4)</td>
<td>93 (9)</td>
<td>149 (3)</td>
<td>289 (16)</td>
<td>280 (19)</td>
</tr>
<tr>
<td>2</td>
<td>Selangor</td>
<td>16 (5)</td>
<td>20 (3)</td>
<td>37</td>
<td>93</td>
<td>97 (2)</td>
<td>208 (7)</td>
</tr>
<tr>
<td>3</td>
<td>Pahang</td>
<td>29 (1)</td>
<td>24</td>
<td>51 (3)</td>
<td>184 (3)</td>
<td>198 (7)</td>
<td>184 (5)</td>
</tr>
<tr>
<td>4</td>
<td>Kelantan</td>
<td>15 (1)</td>
<td>38 (1)</td>
<td>17 (1)</td>
<td>81 (1)</td>
<td>180 (4)</td>
<td>138 (4)</td>
</tr>
<tr>
<td>5</td>
<td>Terengganu</td>
<td>7 (1)</td>
<td>17</td>
<td>42 (1)</td>
<td>55 (3)</td>
<td>107 (4)</td>
<td>126 (9)</td>
</tr>
<tr>
<td>6</td>
<td>Kedah</td>
<td>15 (1)</td>
<td>27</td>
<td>31</td>
<td>28 (1)</td>
<td>52 (2)</td>
<td>106 (9)</td>
</tr>
<tr>
<td>7</td>
<td>N. Sembilan</td>
<td>27 (1)</td>
<td>41</td>
<td>24</td>
<td>49</td>
<td>59</td>
<td>91</td>
</tr>
<tr>
<td>8</td>
<td>Sarawak</td>
<td>32 (2)</td>
<td>42 (2)</td>
<td>37 (3)</td>
<td>46 (1)</td>
<td>58 (5)</td>
<td>70 (4)</td>
</tr>
<tr>
<td>9</td>
<td>Johor</td>
<td>30 (1)</td>
<td>29 (6)</td>
<td>31 (2)</td>
<td>115 (2)</td>
<td>87 (3)</td>
<td>59 (3)</td>
</tr>
<tr>
<td>10</td>
<td>WP KL</td>
<td>31</td>
<td>20 (1)</td>
<td>27 (1)</td>
<td>31</td>
<td>45</td>
<td>54</td>
</tr>
<tr>
<td>11</td>
<td>Sabah</td>
<td>13 (1)</td>
<td>12 (1)</td>
<td>19</td>
<td>41 (2)</td>
<td>34 (2)</td>
<td>35 (1)</td>
</tr>
<tr>
<td>12</td>
<td>P. Pinang</td>
<td>9</td>
<td>25 (1)</td>
<td>28</td>
<td>37</td>
<td>25 (2)</td>
<td>32</td>
</tr>
<tr>
<td>13</td>
<td>Melaka</td>
<td>7 (1)</td>
<td>9 (1)</td>
<td>79 (2)</td>
<td>32 (1)</td>
<td>25</td>
<td>20 (1)</td>
</tr>
<tr>
<td>14</td>
<td>WP Putrajaya</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>15</td>
<td>Perlis</td>
<td>2 (1)</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>WP Labuan</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>263 (20)</td>
<td>378 (20)</td>
<td>527 (22)</td>
<td>949 (22)</td>
<td>1263 (47)</td>
<td>1418 (62)</td>
<td></td>
</tr>
</tbody>
</table>

( ) Death

Source:

Report of Morbidity and Mortality for Patients For The Year 2004 to 2009, Health Management Information System, Medical Care Subsystem, Health Informatics Centre, Planning and Development Division, Ministry of Health, Malaysia
3. FACTORS RESPONSIBLE FOR THE EMERGENCE OF LEPTOSPIROSI

The conditions that are favourable for maintenance and transmission of Leptospirosis are:

a) Reservoir and carrier hosts

Leptospirosis has a very wide range of natural rodent, and non-rodent reservoir hosts especially rats, cattle, dogs, foxes, rabbits, etc. The animals act as carriers of the leptospires and excrete large number of leptospires in their urine, thus responsible for the contamination of large and small water bodies as well as soil.

b) Flooding, drainage congestion

Flooding and drainage congestion may be risk factors for contamination of water bodies with infected animal urine. Water logged areas may force rodent population to abandon their burrows and contaminate the stagnant water by their urine.

c) Animal-Human Interface

The potential for infection increases through exposure from occupational or recreational activities without proper protection. Poor cleanliness/sanitation in recreational areas may attract animal host such as rodent thus increases the risk of contamination. These may be due to poor maintenance of facilities, improper disposal of waste and public attitude/ apathy.

d) Human host risk factors

Several sections of the population are more susceptible to infection such as those not previously exposed to the bacteria in their environment (naïve immunities), and those with chronic disease and open skin wounds.
4. **MODES OF TRANSMISSION**

Infection is acquired from contact through skin, mucosa/ conjunctiva with water or soil contaminated with the urine of rodents, carrier or diseased animals in the environment. Ingestion of contaminated water may also cause infection. There is no documentation of human to human transmission.

5. **HIGH RISK GROUPS**

Exposure depends on chance contacts between human and infected animals or a contaminated environment through occupational and/or recreational activities. Some groups are at higher risk to contract the disease such as:

- Workers in the agricultural sectors
- Sewerage workers
- Livestock handlers
- Pet shops workers
- Military personnel
- Search and rescue workers in high risk environment
- Disaster relief workers (*e.g.* during floods)
- People involved with outdoor/recreational activities such as water recreational activities, jungle trekking, *etc.*
- Travelers who are not previously exposed to the bacteria in their environment especially those travelers and/or participants in jungle adventure trips or outdoor sport activities
- People with chronic disease and open skin wounds.

6. **CLINICAL MANIFESTATIONS**

The incubation period is usually 10 days, with a range of 2 to 30 days (3).

The clinical manifestations are highly variable. Typically, the disease presents in four broad clinical categories (1):

(i) a mild, influenza-like illness (ILI);
(ii) Weil’s syndrome characterized by jaundice, renal failure, haemorrhage and myocarditis with arrhythmias;
(iii) meningitis / meningoencephalitis;
(iv) pulmonary haemorrhage with respiratory failure.

Clinical diagnosis is difficult because of the varied and non-specific presentation. Confusion with other diseases, *e.g.* dengue and other haemorrhagic fevers, malaria, typhoid, melioidosis, influenza, *etc.* is particularly common in the tropics. Presentations may also overlap as the infection progresses.
7. CASE CLASSIFICATION

Leptospirosis is difficult to distinguish from a number of other diseases on clinical grounds alone. History of possible exposure is paramount to aid clinical diagnosis.

7.1 Clinical case

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
- Hemorrhages (from the intestines and lungs)
- Cardiac arrhythmia or failure
- Skin rash
- Gastrointestinal symptoms such as nausea, vomiting, abdominal pain, diarrhea

7.2 Probable Case

A clinical case AND positive ELISA/other Rapid tests.

7.3 Confirmed case:

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

- Microscopic Agglutination Test (MAT),
  For single serum specimen - titre $\geq 1:400$
  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.

Cases that require confirmation are:-

• Hospitalized cases
• All suspected leptospirosis death cases

Notes on Laboratory Diagnosis

• In cases which needed to be confirmed (hospitalized and suspected death cases), serum samples should be sent for confirmation by MAT. The MAT is considered the "gold standard" or cornerstone of serodiagnosis because of its unsurpassed diagnostic (serovar/serogroup) specificity in comparison with other currently available tests. Second serum samples must be taken to detect fourfold or greater rise in titre.

• Simple serological screening method can be done using the rapid test kit for Leptospira. Reminder: any leptospirosis rapid test kit to be used must be validated/approved by IMR.

• The ELISA/other rapid tests detect IgM antibodies. The presence of IgM antibodies may indicate current or recent leptospirosis. A patient’s serum may be positive 5 to 10 days after onset of symptoms but not usually before this. Reminder: IgM-class antibodies may remain detectable for several years.

• If the initial sample was taken at an early stage in the infection, the ELISA test may be positive but MAT negative. Therefore a follow-up sample is required. Test may be negative if the serogroup of the infecting strain does not react with the Patoc 1 serovar strain used as the antigen. If antibiotics are given from the beginning of the illness, the immune and antibody response may be delayed.

• The diagnosis is also confirmed by isolation of Leptospires from blood (first 7 days) or CSF (days 4-10) during the acute illness, from urine (days ≥ 7) and from tissue samples, by using special media. Inoculation of young guinea pigs, hamsters or gerbils can also be carried out for isolation of leptospires. Leptospires die quickly in urine. Clean urine sample should be inoculated into appropriate culture medium not more than 2 hours after voiding. Survival in acid urine may be increased by making it neutral.

For postmortem diagnosis, in addition to serology and culture, leptospires can be demonstrated in tissues using PCR or immunohistochemical staining, notably by direct immunofluorescence.
Figure 1: Leptospiremic phases in conjunction with the laboratory methods of diagnosis (4).

Note: Biphasic nature of leptospirosis and relevant investigations at different stages of disease. Specimens 1 and 2 for serology are acute-phase specimens, 3 is a convalescent-phase sample which may facilitate detection of a delayed immune response, and 4 and 5 are follow-up samples which can provide epidemiological information, such as the presumptive infecting serogroup (4).

Refer to Annex 1 for collection and transportation of clinical and environmental samples for leptospirosis and criteria for water sampling.
8. **NOTIFICATION**

For the purpose of notification, all **probable** and **confirmed** cases must be notified to the nearest Health District Office **within 1 week** of the date of diagnosis.

- Notification of cases can be done using Rev/ 2010 form (Annex 2).
- All notified cases must be investigated using the Investigation Form (Annex 3).

9. **TREATMENT**

- Early treatment with antibiotics is essential.

**Adults**

- Severe cases are usually treated with high doses of IV C-penicillin (2 M units 6 hourly for 5-7 days). Less severe cases treated orally with antibiotics such as doxycycline (2 mg/kg up to 100 mg 12-hourly for 5-7 days), tetracycline, ampicillin or amoxicillin.

- Third generation cephalosporins, such as ceftriaxone and cefotaxime, and quinolone antibiotics may also be effective. Jarisch-Herxheimer reactions may occur after the start of antimicrobial therapy.

- Monitoring and supportive care as appropriate, e.g. dialysis, mechanical ventilation.

**Pediatrics**

<table>
<thead>
<tr>
<th>Preferred</th>
<th>Alternative</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penicillin G</td>
<td></td>
<td><strong>Penicillin:</strong> use in moderate to severe disease</td>
</tr>
<tr>
<td>100 000U/kg/dose</td>
<td></td>
<td>caution in impaired renal function</td>
</tr>
<tr>
<td>IV 6hourly x 7days</td>
<td></td>
<td>Jarisch-Herxheimer reaction has been described in patients with leptospirosis</td>
</tr>
<tr>
<td>&gt;8yrs:</td>
<td>Doxycycline</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4mg/kg/dose oral</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12hourly x 7days</td>
<td></td>
</tr>
<tr>
<td>&lt;8yrs:</td>
<td>Ampicillin</td>
<td><strong>Doxycycline:</strong> used for only mild disease</td>
</tr>
<tr>
<td></td>
<td>75-100mg/kg/dose oral</td>
<td>can cause permanent discoloration of teeth</td>
</tr>
<tr>
<td></td>
<td>6hourly x 7days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amoxicillin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50mg/kg/dose oral 6-8hourly x 7days</td>
<td></td>
</tr>
<tr>
<td><strong>Preferred</strong></td>
<td><strong>Alternative</strong></td>
<td><strong>Comments</strong></td>
</tr>
<tr>
<td>Penicillin G</td>
<td>Doxycycline</td>
<td><strong>Penicillin:</strong> use in moderate to severe disease</td>
</tr>
<tr>
<td>100 000U/kg/dose</td>
<td>4mg/kg/dose oral</td>
<td>caution in impaired renal function</td>
</tr>
<tr>
<td>IV 6hourly x 7days</td>
<td>12hourly x 7days</td>
<td>Jarisch-Herxheimer reaction has been described in patients with leptospirosis</td>
</tr>
<tr>
<td>&gt;8yrs:</td>
<td>Ampicillin</td>
<td><strong>Doxycycline:</strong> used for only mild disease</td>
</tr>
<tr>
<td></td>
<td>75-100mg/kg/dose oral</td>
<td>can cause permanent discoloration of teeth</td>
</tr>
<tr>
<td></td>
<td>6hourly x 7days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amoxicillin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50mg/kg/dose oral 6-8hourly x 7days</td>
<td></td>
</tr>
</tbody>
</table>
10. PROPHYLAXIS

The cost effectiveness and risk versus benefits of antibiotic prophylaxis for leptospirosis remains unclear. If prophylaxis is considered, the possible options include:

Pre-exposure Prophylaxis

- May be considered for people at high risk of exposure to potentially contaminated sources e.g. soldiers going into jungles, rescue team, persons involved in activities in possible high risk areas e.g. adventurous sports.

- Dose:
  
  Doxycycline 200mg stat dose then weekly throughout the stay  
  OR  
  Azithromycin 500mg stat dose then weekly throughout the stay *(For pregnant women and those who are allergic to Doxycycline)*

- However the benefit of pre-exposure prophylaxis remains controversial where possible benefits need to be balanced with potential side effects (e.g. doxycycline induced photosensitivity, nausea, etc.)

Empirical treatment for Post-Exposure

- In an outbreak, there **may be a role** for post exposure prophylaxis for those exposed to a common source as the index case. Dose:
  
  Doxycycline 200mg stat dose then followed by 100mg BD for 5 – 7 days **for those symptomatic with the first onset of fever**.  
  OR  
  Azithromycin 1gm on Day-1, followed by Azithromycin 500mg daily for 2 days *(For pregnant women and those who are allergic to Doxycycline)*

**Note:**

The role of prophylaxis in children has not been adequately studied.
11. **SURVEILLANCE**

Reliable data on the incidence and prevalence of leptospirosis in many parts of the world are scarce and most probably overlooked and underreported (1). Studies may be performed on selected groups (rice farmers, meat workers, etc.) in a population that is likely to be exposed to leptospires. While the incidence rate for the whole of the population in an area may be low, it may be very high in a selected risk group. Preventive methods may be focused on selected risk groups.

In order to obtain the actual disease burden leptospirosis is made a notifiable disease in Malaysia under the Prevention and Control of Communicable Diseases Act 1988 since 2010. For the purpose of surveillance, the State Health Departments must compile a database for Leptospirosis. This database must have information on possible source of infection **(Annex 4)**.

11.1 Hospital-based surveillance

The diagnosis should be confirmed by laboratory tests as the clinical manifestations of leptospirosis are often atypical. Leptospirosis should be suspected in patients presenting with symptoms such as fever, severe headache, prostration, aching muscles or conjunctival suffusion, or patients presenting with signs of aseptic meningitis, adult respiratory distress syndrome with pulmonary haemorrhage, kidney failure or jaundice. Data should be collected on the age, sex, occupation and exposure history (place, date, conditions of animal contact or contact with contaminated environment) of the patient.

Laboratory methods are required to confirm the diagnosis. Isolation followed by typing is essential for surveillance as it provides information about the leptospires circulating in a certain area. In addition, typing data can be compared with the clinical manifestations of the disease in the area concerned. Serology is also important but, because of cross reactions, the information obtained is of limited value in terms of causative serovars. Mild cases may not be admitted to hospital, so hospital-based surveillance may result in a bias towards severity in assessing the public health importance of leptospirosis.

Very severe cases may also be missed as patients may die at an early stage of the disease before the diagnosis can be established. Especially in these cases, culture, PCR and immunohistochemistry may be useful methods of demonstrating the leptospiral aetiology in post-mortem samples.

11.2 Serosurveillance (Laboratory based surveillance)

The detection of persisting antibodies by the microscopic agglutination test (MAT) may give an indication of the prevalence of leptospirosis in an area. It is best to carry out the MAT using a panel of antigens that is representative of the locally circulating leptospires. If the local strains are not fully known, a broad panel with representative strains of all currently known serogroups should be used. Persisting antibodies from a past infection are usually serogroup-specific. Titres to serovars used as antigens and
their frequency of distribution may give information on the prevalence of these serovars or on antigenically similar serovars belonging to the same serogroup.

ELISA tests provide information only on recent or current cases and no information on the circulating serovars because they use a broadly reactive so-called genus-specific antigen to check for IgM antibodies.

11.3 Active Surveillance

In certain circumstances, active surveillance can be carried out and helpful in determining the incidence of leptospirosis in a community. Such active surveillance may provide valuable information on the "normal" incidence of leptospirosis in a community and may identify serovars present in the area. Arrangement with public health laboratories may enable samples to be analysed.

12. OUTBREAK RESPONSE

Definition:

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

- **All cases must be investigated and control measures taken wherever possible.** During an outbreak, the District Health Office should also investigate the clinical cases. All symptomatic cases in an outbreak should be admitted to hospital for laboratory confirmation and treatment.

- All outbreaks must be notified to National Crisis Preparedness and Response Centre (CPRC) KKM by phone or text/sms to on-call surveillance at 013-6699700 or email to cprc@moh.gov.my

- Send all outbreak preliminary reports to the CPRC, Disease Control Division by e-mail, text/sms, and fax using the BKP/WABAK/01/2005 Form (Annex 5) within 24 hours.

- A final report must be produced after 1 month the outbreak ends and sent to CPRC, Disease Control Division.

Refer Annex 6 for Flow Chart of Notification of cases/outbreak.
13. **PREVENTION & CONTROL**

Because of the large number of serovars, variety of infection sources and the wide differences in transmission conditions, the prevention and control of leptospirosis is complex. Effective prevention and control can be achieved by controlling the reservoir or reducing infection in animal reservoir populations such as dogs or livestock via treatment or vaccination of the animals. Control of wild animals may be difficult. Preventive measures must be based on knowledge of the groups at particular risk of infection and the local epidemiological factors.

Prevention and control should be targeted at:

(a) The infection source;
(b) The route of transmission between the infection source and the human host; or
(c) Prompt and proper treatment of infection.

### 13.1 Preventive and Control Measures

- **Health Education:** Health education activities are to be carried out to create awareness among the public about the disease and motivate them to take preventive actions. This needs to be done through multiple strategies in order to reach the specific target groups. This could be done by using the electronic, printed and interpersonal means. It is important to ensure that messages delivered are relevant, timely and culturally acceptable to the target groups. A proper needs assessment has to done to ascertain the target groups’ needs in order to alleviate their fear and concerns.

- Risk assessment of possible contaminated water sources/bodies. Examples of risk assessment forms used by Perak State Health Department are attached in Annex 7a & 7b. **Reminder:** The formats are flexible and changes can be made according to the situation in respective states.

- Alert public or users regarding the hazards of possible contaminated areas. Health hazard warning signage (**examples as in Annex 8a & 8b**) should be posted in areas found to be contaminated through environment risk assessment (co-operation with local authorities).

- Persons with occupational or recreational exposure to potentially contaminated water or soil should:-
  - Wear waterproof protective clothing such as rubber boots and gloves.
  - Cover skin lesions with waterproof dressings.
  - Wash with clean water immediately after exposure.
- Seek immediate medical treatment if develop symptoms within the incubation period.

- Advise public to keep their homes and premises free from rodents.

- Advise people to vaccinate their pets against leptospirosis.

- Promote cleanliness at the recreational areas, food premises as well as housing area.

- Promote interagency collaboration such as with local authorities, Wildlife Department (*PERHILITAN*), Department of Veterinary Services (*JPV*), National Training Service Department (*JLKN*), *etc.* to maintain cleanliness in the respective environmental settings, especially rodent control.
REFERENCES


## COLLECTION AND TRANSPORTATION OF CLINICAL AND ENVIRONMENTAL SAMPLES FOR LEPTOSPIROSIS

### 1. Clinical Sample

#### Table 1: Clinical sample Collection and Transportation

<table>
<thead>
<tr>
<th>Test</th>
<th>Specimen</th>
<th>Container</th>
<th>Storage &amp; Transport condition</th>
<th>Where to send</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELISA or any other rapid immune diagnostic kit</td>
<td>Serum</td>
<td>Plain tube (3 mL)</td>
<td>Ambient. If delay is unavoidable store at 4-8°C.</td>
<td>1. Hospital with facilities or 2. IMR or 3. MKAK (for community outbreak)</td>
</tr>
<tr>
<td>MAT</td>
<td>Serum (same sample for ELISA can be used for MAT)  A repeat convalescent sample (at least 1 week later) is necessary to confirm cases.</td>
<td>Plain tube (3 mL)</td>
<td>Ambient or 4-8°C if delay is unavoidable</td>
<td>1. IMR 2. MKAK (for community outbreak)</td>
</tr>
<tr>
<td>PCR</td>
<td>Whole blood</td>
<td>EDTA tube (2mL)</td>
<td>Ambient or 4-8°C if delay is unavoidable</td>
<td>1. IMR 2. MKAK (for community outbreak)</td>
</tr>
<tr>
<td></td>
<td>Mid stream Urine–</td>
<td>Sterile plain leak proof container.</td>
<td>Ambient.</td>
<td>1. IMR 2. MKAK (for community outbreak)</td>
</tr>
<tr>
<td></td>
<td>Blood</td>
<td>Heparin tube (4-5 mL)</td>
<td>Ambient</td>
<td>IMR</td>
</tr>
<tr>
<td></td>
<td>CSF / body fluids</td>
<td>Sterile container</td>
<td>Ambient</td>
<td>IMR</td>
</tr>
<tr>
<td></td>
<td>Tissue</td>
<td>Sterile container</td>
<td>Ambient</td>
<td>IMR</td>
</tr>
</tbody>
</table>
Notes:
a. Best done during first week of symptoms. Sensitivity is low once seroconversion has occurred
b. only useful if taken ≥7 days after onset prior to antibiotics.
c. Best sensitivity during first week of symptoms and prior to antibiotic administration. Culture is done mainly for epidemiological surveillance. Sensitivity is usually less than 30%. This test is not useful for guide in management. Identification of the isolated leptospiral strain is important in future understanding of disease transmission, knowledge on reservoir hosts, pathogenesis of disease and useful in decision making regarding use of vaccines for prevention of disease.
- Clinical sample for community outbreak to MKAK should use form MKAK-BPU-UO1
- Each sample should be properly labeled and sent to laboratory as early as possible. In case of delay, the samples should be stored at 4-8 °C (except samples for culture) before transporting to the laboratory.

Contact numbers:
1. IMR – 03-26162504 (Leptospirosis lab); 03-26162658 (Bacteriology Unit)
2. MKAK – 03-61261329/1330 (Bacteriology Unit)

Table 2: Post-mortem samples Collection and Transportation (Post-mortem should be performed under strictly aseptic technique)

<table>
<thead>
<tr>
<th>Test</th>
<th>Specimen</th>
<th>Container</th>
<th>Transport condition</th>
<th>Where to send</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCR</td>
<td>Intracardiac blood</td>
<td>EDTA Sterile container</td>
<td>Ambient temperature or 4-8°C if delay unavoidable</td>
<td>IMR</td>
</tr>
<tr>
<td></td>
<td>Tissues (brain, lung, liver, heart, kidneys)</td>
<td>Sterile container</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CSF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture</td>
<td>Blood</td>
<td>Heparin tubes. Sterile container</td>
<td>Ambient temperature</td>
<td>IMR</td>
</tr>
<tr>
<td></td>
<td>Tissues, CSF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immunohistochemistry</td>
<td>Tissues Paraffin Blocks or slides with mounted tissue sections (microtomised tissues 4-40 uM)</td>
<td></td>
<td>Ambient temperature</td>
<td>IMR</td>
</tr>
</tbody>
</table>
## 2. Environmental Sample

### Table 3: Environmental Sample Collection and Transportation

<table>
<thead>
<tr>
<th>Type of samples</th>
<th>Quantity</th>
<th>Container</th>
<th>Transport condition</th>
<th>Where to send</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>100 – 250mL</td>
<td>Sterile whirl pack or sterile bottle</td>
<td>Ambient temperature or 4-8°C if delay unavoidable</td>
<td>MKAK Sg. Buloh</td>
</tr>
<tr>
<td>Soil (moist soil)</td>
<td>200 gram</td>
<td>Sterile whirl pack or sterile bottle</td>
<td>Ambient temperature or 4-8°C if delay unavoidable</td>
<td>MKAK Sg. Buloh</td>
</tr>
</tbody>
</table>

**Notes:**
- Use form MKAK-PER-104B-02 / 1 Environment sample.
- Completed laboratory form request and specimen should be sent to MKAK within 48 hours.

Viability and reproducibility of pathogenic leptospira reduces at temperature below 10°C. Best to transport environmental samples only at ambient temperature.
3. **Animal sample**

Trapped rodents or animals to be sent alive to Veterinary Research Institute (VRI). **Prior arrangement must be made before sending of animals.**

**Contact Number:** 05-5457166 ext 138 (Serology Unit, VRI)
NOTA:
KRITERIA PEMILIHAN KAWASAN PENAMPILAN AIR UNTUK UJIAN LEPTOSPIROSIS

1. Kawasan persampelan air yang sesuai adalah:
   i. Kawasan Teduh
   ii. Kawasan yang disyaki terdapat kehadiran haiwan (ie: bekas tapak kaki)
   iii. Celah- celah Batu

2. Sampel air diambil satu kali di bawah permukaan air.
   NOTA: Penyampel diminta untuk melakarkan bentuk tasik/kolam dengan melabelkan 4 kawasan persampelan (beserta petunjuk) di ruagan yang disediakan dalam borang MKAK PER-104B-02 /1


TATACARA PENGAMBILAN SAMPEL AIR DARIPADA SUNGAI/TELAGA/ KOLAM/ TASIK/ LOMBONG UNTUK UJIAN LEPTOSPIROSIS

1. Bersihkan baldi logam/aluminium daripada sebarang kotoran.

2. Tuangkan sedikit alkohol 70% ke dalam baldi, nyalakan dan biarkan terbakar dindingnya (sebelah dalam)untuk pembasmian kumam.

3. Tuangkan alkohol 70% ke dalam dulang dan letakan baldi ke dalamnya. Bakar dindingnya untuk membasmi kuman di permukaan luar.


6. Masukkan thiobeg/botol yang telah diisi air ke dalam “cool box” dalam susunan menegak Sampel air yang telah dikumpulkan perlu dihantar ke MKAK dengan kadar segera (48 jam) bersama borang MKAK PER-104B-02 /1 dan disimpan pada suhu sekitar 4 -8°C sekitanya kelewatan tidak dapat di elakkan.


NOTA: Baldi aluminium perlu dibersihkan dengan air bersih (air paip atau air suling) sebelum diguna untuk pensampelan di tempat pensampelan yang lain. Baldi hendaklah dikeringkan untuk disimpan selepas diguna.
KRITERIA PEMILIHAN KAWASAN PENSAMPELAN TANAH UNTUK UJIAN LEPTOSPIROSIS

1. Kawasan tanah persampelan adalah pada jarak kurang dari 5 meter daripada tepi sungai/kolam/tasik.

   **NOTA:** Penyampel diminta untuk melakarkan bentuk tasik dan kawasan tanah dengan melabelkan kawasan persampelan (beserta petunjuk) di borang yang disediakan.

2. Proses pengambilan sampel digalakkan pada waktu pagi. Keadaan kawasan persampelan tanah yang sesuai adalah:
   i. Kawasan yang lembap atau basah (terdapat lopak-lopak air)
   ii. Kawasan yang teduh
   iii. Kawasan yang disyaki kehadiran haiwan (terdapat bekas tapak kaki)

3. Sampel tanah diambil pada area 15-20 cm x 4-8 cm. Kuantiti tanah yang diperlukan adalah 100-200g. Catatkan suhu dan pH tanah tersebut pada borang permohonan.

4. Sampel tanah dimasukkan ke dalam ‘whirl pack’ dan dihantar dengan segera ke MKAK pada suhu ambient dalam tempoh 24 jam atau pada suhu 4-8°C sekiranya berlaku kelewatan.
LEPTOSPIROSIS LABORATORY REQUEST FORM
BACTERIOLOGY UNIT
INSTITUTE FOR MEDICAL RESEARCH KUALA LUMPUR

Hospital: __________________________
R/N: ______________________________
Date of Admission: ________________

Sample Type: _______________________
(Please note that blood sample has to be taken using aseptic technique. Whenever possible, 10 mls of sample is taken, 3 mls in plain tube, 2 mls in EDTA tube and 5 mls in Heparin tube. If not possible, please send in plain tube only)

Sample No: 1st □  2nd □  3rd □
Sample Date: _____________________
Test Request

Name: ____________________________  Age: ______________
Gender: Male □  Female □
Race: Malay □  Chinese □  Indian □  Others: ____________
I/C/ ID No. : ____________________________
Address: __________________________________________
Occupation: __________________________
Number of Days of illness prior to admission: ____________
History of activities that may predispose to infection: Please state locality where activities was done and when (days or week before onset symptoms):

Bathing □  Fishing □
Hunting □  Camping □
Others (State) ____________  Days/weeks before onset illness: ____________
Contact with animals (eg rodents, cows etc) : ________________________
Underlying disease/s: __________________________
Antibiotic therapy: __________________ Date started: ________________
Dialysis: Date/s done: ________________

Clinical features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Jaundice</th>
<th>Diarrhoea</th>
<th>Rash</th>
<th>Convulsion</th>
<th>Lymphadenopathy</th>
<th>Hepatomegaly</th>
<th>Splenomegaly</th>
<th>‘Altered mental status’</th>
<th>Nausea/Vomiting</th>
<th>OTHER FEATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chills and rigors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anorexia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retroorbital pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calf pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>myalgia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conjunctival redness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>arthralgia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abd. Pain: Which area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cough</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemoptysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe pulmonary haemorrhage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CXR: __________________

Respiratory failure: Yes/No

ECG abnormalities: __________________

CSF: __________________

Admitted to ICU: Yes/No
Passed away: Yes/No

Laboratory Results:

|-------|-----|-----|----------------------|-----------------------|---------|-----------------|------|----|-----|-----|----|-----|------------|------------|-----------------|-------------|-----------------|-----|----|-----|-----|----------------|--------------|----------|-----------------|-----------|------------|-----------|

Name of requesting Doctor: ___________________________________________
Signature: __________________________
# Laboratory Request Form MKA (Clinical)

**MKAK-BPU-U01**

## REQUESTOR INFORMATION

<table>
<thead>
<tr>
<th>Name :</th>
<th>Post :</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address :</th>
<th>State :</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>District :</th>
<th>Tel. No. :</th>
<th>Fax No. :</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Email :</th>
<th>Lan No. (for lab use):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MAKMAL KESIHATAN AWAM KEBANGSAAN**

**KEMENTERIAN KESIHATAN MALAYSIA**

Lot 1853, Kg Melayu Sungai Buloh,
47000 Sungai Buloh, Selangor Darul Ehsan
Tel:03-61565109 Fax:03-61402249/61569654

## LABORATORY REQUEST FORM

### A. PATIENT'S INFORMATION

<table>
<thead>
<tr>
<th>Name :</th>
<th>Age :</th>
<th>Date of Birth :</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IC No :</th>
<th>Sex :</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Your Reference No. :</th>
<th>Marital Status :</th>
<th>Single</th>
<th>Married</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address :</th>
<th>Postcode :</th>
<th>State :</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>District :</th>
<th>Nationality :</th>
<th>Malaysian</th>
<th>Non Malaysian :</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Please state country of origin)

<table>
<thead>
<tr>
<th>Tel. No :</th>
<th>Occupation :</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### B. CLINICAL SUMMARY

**Sign and Symptoms :**

- Outbreaks / Cluster
- Diagnostic
- Surveillance
- Programme/Projects
- Others :

<table>
<thead>
<tr>
<th>Cluster Code :</th>
<th>Specimen Category :</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### C. PURPOSE OF SAMPLING

<table>
<thead>
<tr>
<th>Immunisation status (for the specified disease) :</th>
<th>Yes</th>
<th>Number of Doses :</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Date of last dose :</td>
</tr>
</tbody>
</table>

### D. FOR VACCINE PREVENTABLE DISEASE

**Date of onset :**

**Clinical/Provisional Diagnosis :**

- Yes
- No

### E. SPECIMEN INFORMATION

<table>
<thead>
<tr>
<th>Type of Specimen</th>
<th>Date and Time of Collection</th>
<th>Date Specimen Received (for lab use)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### F. TYPE OF TESTS

- **Bacterial identification :** (culture ± sensitivity)
- **Viral Identification :** Isoation / Antigen Detection / Nucleic acid
- **Serology (Specify) :**
- **Others (Specify) :**

### G. RESULTS (for laboratory use only) :

<table>
<thead>
<tr>
<th>Verified By :</th>
<th>Date :</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NB : Please send request form in duplicate**
Laboratory Request Form MKA (Environmental Sample)  

MAKMAL KESIHATAN AWAM KEBANGSAAN,  
Lot 1853 Kg. Melayu Sg.Buloh  
47000 Sg.Buloh, Selangor Darul Ehsan  
No. Tel: 03-61261200 No. Faksimili: 03-64102249 / 61569654

---------------------------------------------------------------------------------------------------

BORANG PEMOHONAN PENYIASATAN/PEMANTAUAN LEPTOSPIRA

<table>
<thead>
<tr>
<th>Institusi yang memohon:</th>
<th>Tarikh/ masa pengambilan sampel:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Faks:</td>
<td>Lokasi Persampelan:</td>
</tr>
<tr>
<td>Tandatangan/ cop rasmi:</td>
<td>Jenis sampel:</td>
</tr>
<tr>
<td></td>
<td>Maklumat kes:</td>
</tr>
</tbody>
</table>

Lakaran Kawasan Persampelan/ Kolam:

Petunjuk:

Analisa Parameter Fizikal

<table>
<thead>
<tr>
<th>ID Sampel</th>
<th>Masa Persampelan</th>
<th>Suhu (°C)</th>
<th>pH</th>
<th>Kekeruhan</th>
<th>Clarity</th>
<th>Warna</th>
<th>Catatan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tarikh/masa terima sampel:  
Nama dan Tandatangan penerima:
Annex 2a
Borang Notis: Rev/2010
No. Siri:

NOTIFIKASI PENYAKIT BERJANGKIT YANG PERLU DILAPORKAN
(Seksyen 10, Akta Pencegahan Dan Pengawalan Penyakit Berjangkit 1988)

A. MAKLUMAT PESAKIT

1. Nama Penuh (HURUF BESAR):
   | Nama Pengiring (Ibu/Bapa/Penjaga): |

2. No. Kad Pengenalan Diri / Dokumen Perjalanan
   (Untuk Bukan Warganegara)
   | No. Kad: | Nama Wad: | Tarih Masuk Wad: |

3. Kewarganegaraan:
   | Warganegara: | Keturunan: |
   | Negara Asal: | Status Kedatangan: |

4. Jantina: Lelaki | Perempuan

5. Tarikh Lahir: |

6. Umur: Tahun | Bulan | Hari

7. Pekerjaan:

8. No. Telefon: Rumah | Tel. Bimbit | Pejabat

9. Alamat Kediaman

10. Alamat Tempat Kerja / Belajar

B. DIAGNOSIS PENYAKIT

<table>
<thead>
<tr>
<th>No.</th>
<th>Penyakit</th>
<th>Status Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Acute Poliomyelitis</td>
<td>Latent</td>
</tr>
<tr>
<td>2</td>
<td>Cholera</td>
<td>Latent</td>
</tr>
<tr>
<td>3</td>
<td>Dengue</td>
<td>Latent</td>
</tr>
<tr>
<td>4</td>
<td>Dysentery</td>
<td>Latent</td>
</tr>
<tr>
<td>5</td>
<td>Ebola</td>
<td>Latent</td>
</tr>
<tr>
<td>6</td>
<td>Diphtheria</td>
<td>Latent</td>
</tr>
<tr>
<td>7</td>
<td>Chancroid</td>
<td>Latent</td>
</tr>
<tr>
<td>8</td>
<td>Cholerain</td>
<td>Latent</td>
</tr>
<tr>
<td>9</td>
<td>Diphtheria</td>
<td>Latent</td>
</tr>
<tr>
<td>10</td>
<td>Dengue Haemorrhagic Fever</td>
<td>Latent</td>
</tr>
<tr>
<td>11</td>
<td>Measles</td>
<td>Latent</td>
</tr>
<tr>
<td>12</td>
<td>Malaria</td>
<td>Latent</td>
</tr>
<tr>
<td>13</td>
<td>Malaria</td>
<td>Latent</td>
</tr>
<tr>
<td>14</td>
<td>Malaria</td>
<td>Latent</td>
</tr>
<tr>
<td>15</td>
<td>Malaria</td>
<td>Latent</td>
</tr>
<tr>
<td>16</td>
<td>Hand, Food and Mouth Disease</td>
<td>Latent</td>
</tr>
<tr>
<td>17</td>
<td>HIV</td>
<td>Latent</td>
</tr>
<tr>
<td>18</td>
<td>Influenza</td>
<td>Latent</td>
</tr>
<tr>
<td>19</td>
<td>Leprosy</td>
<td>Latent</td>
</tr>
<tr>
<td>20</td>
<td>Leprosy</td>
<td>Latent</td>
</tr>
<tr>
<td>21</td>
<td>Leptospirosis</td>
<td>Latent</td>
</tr>
<tr>
<td>22</td>
<td>Malaria - Vivax</td>
<td>Latent</td>
</tr>
<tr>
<td>23</td>
<td>Malaria - Falciparum</td>
<td>Latent</td>
</tr>
<tr>
<td>24</td>
<td>Malaria - Malaria</td>
<td>Latent</td>
</tr>
<tr>
<td>25</td>
<td>Malaria - Lain-lain</td>
<td>Latent</td>
</tr>
<tr>
<td>26</td>
<td>Measles</td>
<td>Latent</td>
</tr>
<tr>
<td>27</td>
<td>Plague</td>
<td>Latent</td>
</tr>
<tr>
<td>28</td>
<td>Rabies</td>
<td>Latent</td>
</tr>
<tr>
<td>29</td>
<td>Relapsing Fever</td>
<td>Latent</td>
</tr>
<tr>
<td>30</td>
<td>Syphilis - Acquired</td>
<td>Latent</td>
</tr>
<tr>
<td>31</td>
<td>Syphilis - Acquired</td>
<td>Latent</td>
</tr>
<tr>
<td>32</td>
<td>Diphtheria</td>
<td>Latent</td>
</tr>
<tr>
<td>33</td>
<td>Tuberculosis - PFB Smooth Positive</td>
<td>Latent</td>
</tr>
<tr>
<td>34</td>
<td>Typhus - Scrub</td>
<td>Latent</td>
</tr>
<tr>
<td>35</td>
<td>Tuberculosis - PFB Smooth Positive</td>
<td>Latent</td>
</tr>
<tr>
<td>36</td>
<td>Tuberculosis - PFB Smooth Positive</td>
<td>Latent</td>
</tr>
<tr>
<td>37</td>
<td>Tuberculosis - Extra Pulmonary</td>
<td>Latent</td>
</tr>
<tr>
<td>38</td>
<td>Typhoid - Salmonella Typhi</td>
<td>Latent</td>
</tr>
<tr>
<td>39</td>
<td>Typhoid - Paratyphoid</td>
<td>Latent</td>
</tr>
<tr>
<td>40</td>
<td>Viral Encephalitis - Japanese</td>
<td>Latent</td>
</tr>
<tr>
<td>41</td>
<td>Viral Encephalitis - Alipah</td>
<td>Latent</td>
</tr>
<tr>
<td>42</td>
<td>Viral Encephalitis - Lain-lain</td>
<td>Latent</td>
</tr>
<tr>
<td>43</td>
<td>Whooping Cough / Pertussis</td>
<td>Latent</td>
</tr>
<tr>
<td>44</td>
<td>Yellow Fever</td>
<td>Latent</td>
</tr>
<tr>
<td>45</td>
<td>Lain-lain - nyatakan:</td>
<td>Latent</td>
</tr>
</tbody>
</table>

C. MAKLUMAT PEMBERITAHU

11. Cara Pengesanan Kes: Kes | Kontak | FORMENA
12. Status Pesakit: Hidup | Mat | Sementara
13. Tarikh Onset: |
14. Ujian Makmal:
   | Nama Ujian: | (i) | (ii) | (iii) |
15. Keputusan Ujian Makmal:
   | Positif | Negatif | Belum Slap |
16. Status Diagnosis: Sementara (Provisional/Suspected)
17. Maklumat Klinikal Yang Relevan: |
18. Komen: |
19. Nama Pengamal Perubatan: |
20. Nama Hospital / Klinik dan Alamat: |
21. Tarikh Notifikasi: |
# Annex 2b

## Notification Form: Rev/2010

### Notification of Communicable Diseases to Be Reported

*(Section 10, Prevention and Control of Communicable Diseases Act, 1988)*

### A. PATIENT INFORMATION

1. **Full Name (CAPITAL LETTER):**
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]

2. **Accompany by (Mother/Father/Guardian):**
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]

3. **Identity Card Number / Travelling Document:**
   - [Enter number here]
   - [Enter number here]
   - [Enter number here]
   - [Enter number here]
   - [Enter number here]
   - [Enter number here]
   - [Enter number here]
   - [Enter number here]
   - [Enter number here]

4. **Gender:**
   - [Male]
   - [Female]

5. **Date of Birth:**
   - [Day]
   - [Month]
   - [Year]

6. **Age:**
   - [Enter age here]
   - [Enter age here]
   - [Enter age here]
   - [Enter age here]
   - [Enter age here]
   - [Enter age here]
   - [Enter age here]
   - [Enter age here]
   - [Enter age here]

7. **Occupation:**
   - [Enter occupation here]
   - [Enter occupation here]
   - [Enter occupation here]
   - [Enter occupation here]
   - [Enter occupation here]
   - [Enter occupation here]
   - [Enter occupation here]
   - [Enter occupation here]
   - [Enter occupation here]

8. **Telephone No.:**
   - [Resident]
   - [Office]

9. **Current Address:**
   - [Enter address here]
   - [Enter address here]
   - [Enter address here]
   - [Enter address here]
   - [Enter address here]
   - [Enter address here]
   - [Enter address here]
   - [Enter address here]
   - [Enter address here]

10. **Address of Employer/School/College/University:**
    - [Enter address here]
    - [Enter address here]
    - [Enter address here]
    - [Enter address here]
    - [Enter address here]
    - [Enter address here]
    - [Enter address here]
    - [Enter address here]
    - [Enter address here]

### B. DISEASE DIAGNOSIS

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

**Besides by written notification, the following diseases must be notified by telephone within 24 hours, such as:- Acute Poliomyelitis, Cholera, Dengue, Diptheria, Ebola, Food Poisoning, Plague, Rabies and Yellow Fever.**

### C. NOTIFIER

19. Name of Medical Practitioner:
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]
   - [Enter name here]

20. Name and address of Hospital/Clinic:
    - [Enter address here]
    - [Enter address here]
    - [Enter address here]
    - [Enter address here]
    - [Enter address here]
    - [Enter address here]
    - [Enter address here]
    - [Enter address here]
    - [Enter address here]

21. Date of Notification:
    - [Enter date here]
    - [Enter date here]
    - [Enter date here]
    - [Enter date here]
    - [Enter date here]
    - [Enter date here]
    - [Enter date here]
    - [Enter date here]
    - [Enter date here]
ANNEX 3
KKM/BKP/ZOONOSIS/LEPTO/1/2011

BAHAGIAN KAWALAN PENYAKIT
KEMENTERIAN KESIHATAN MALAYSIA
BORANG SIASATAN KES LEPTOSPIROSIS

Daerah : 
Negeri : 
Tarikh Siasatan : 

A. DATA DEMOGRAFI

1. Nama : ____________________________
2. Umur : __________
3. Jantina :  □ Lelaki  □ Perempuan
4. No. ID (S/B,K/P,Passport) : ________________________________
5. Ethnik : __________________________
6. Kewarganegaraan: ____________________
7. No. Tel : __________________________
8. Alamat Rumah : ________________________________
   __________________________________________
9. Pekerjaan : __________________________
10. Alamat Tempat Kerja/ Sekolah* : ________________________________
    __________________________________________

B. RIWAYAT KLINIKAL

11. Tarikh onset : __________
12. Tarikh masuk wad* : __________ Hospital: __________ RN: ______
13. Simptom & gejala klinikal : (Tandakan yang berkaitan)

Simptom: Gejala Klinikal:

Demam, Ruam
Sakit kepala Jaundis
mengigil Radang mata (Conjunctival suffusion)
Sakit otot Lain-lain, nyatakan: ____________
Sakit otot betis (Calf pain)
Sakit Sendi
   Malaise
Sakit abdomen
   Loya
Muntah
Diarrhea
   Lain-lain, nyatakan: ____________
Batuk
Sesak nafas
   Lain-lain, nyatakan: ____________

15. Ujian Diagnostik makmal:  

<table>
<thead>
<tr>
<th>Nama Ujian</th>
<th>Tarikh Pensampelan</th>
<th>Nama Makmal</th>
<th>Keputusan</th>
<th>Catatan</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT</td>
<td></td>
<td></td>
<td>Disahkan (Confirme d)</td>
<td></td>
</tr>
<tr>
<td>PCR</td>
<td></td>
<td></td>
<td>Probable</td>
<td></td>
</tr>
<tr>
<td>ELISA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rapid test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nota:  
Kes Probable (diagnosa Klinikal+ ujian makmal seperti rapid test dan/ atau ELISA )  
Kes disahkan (melalui ujian makmal MAT atau/dan PCR)  

16. Adakah pesakit dirawat dengan antibiotik? □ Ya □ Tidak  

17. Status Pesakit: □ Sedang dirawat □ Sembuh □ Mati  
Tarikh Keluar wad*: _____________________  
Tarikh mati*: _____________________  

C. FAKTOR RISIKO  

18. Adakah jangkitan ini berkaitan dengan pekerjaan? □ Ya □ Tidak  
Jika ya, nyatakan bidang pekerjaan: _____________________  

19. Adalah jangkitan ini berkaitan dengan aktiviti rekreasi (Contoh: berkhemah, berenang, berkayak, berkelah dll)? □ Ya □ Tidak  
Jika Ya, nyatakan jenis aktiviti:__________________________  
Tempat: ____________________  
Tarikh pendedahan: ____________________  

20. Adalah jangkitan ini berkaitan hubungan langsung (direct contact) dengan haiwan? □ Ya □ Tidak  
Jika ya, nyatakan jenis haiwan: ____________________  
Tempat: ____________________  

21. Adakah jangkitan ini berkaitan dengan air untuk kegunaan harian? □ Ya □ Tidak  
Sumber air: ____________________  

22. Adakah jangkitan ini berkaitan dengan kejadian banjir? □ Ya □ Tidak  

23. Lain-lain maklumat yang berkaitan dengan risiko jangkitan, nyatakan:  
________________________________________________________________________  
________________________________________________________________________
24. Adakah anda mengenali sesiapa yang mempunyai simptom yang serupa?

Ya □ Tidak □ Tidak diketahui □

Jika ya, senaraikan:

<table>
<thead>
<tr>
<th>Nama</th>
<th>Hubungan</th>
<th>No. Tel</th>
<th>Catatan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Guna lampiran yang lain sekiranya ruangan tidak cukup)

*jika berkenaan

D. KOMEN/ TINDAKAN SUSULAN

Komen Pegawai Penyiasat:


Tandatangan & cop :
Nama penyiasat :______________________________
Jawatan :______________________________
No. Tel : (Pej) ________________________
(HP) ________________________
Tarikh : ________________________

Komen PPKP Kanan/Pegawai Kesihatan Daerah


Tandatangan & cop :
Nama Pegawai :______________________________
Jawatan :______________________________
No. Tel : (Pej) ________________________
(HP) ________________________
Tarikh : ________________________
Example of *Leptospirosis* database format

<table>
<thead>
<tr>
<th></th>
<th>NAMA</th>
<th>UMUR</th>
<th>JANTINA</th>
<th>UJIAN</th>
<th>DASIH</th>
<th>Kemasukkan Ke Hospital</th>
<th>Tarikh Kemasukkan</th>
<th>Tarikh Onset</th>
<th>NAMA MAKLAM UJIAN</th>
<th>JENIS UJIAN</th>
<th>STATUS UJIAN</th>
<th>BANKSA</th>
<th>NEGERI</th>
<th>PUNCA JANGKITAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Osema oleh:  
Jawatan:  
Tarikh:  

Kes Positif berlaku:  
1. kes Probable (diagnosis Klinikal+ ujian makmal seperti rapid test dan/ atau ELISA)  
2. kes disahkan (melalui ujian makmal MAT atau/dan PCR atau disahkan oleh 2 jenis rapid test)  

**Annex 4**
**BORANG LAPORAN AWAL WABAK PENYAKIT**

Sumber laporan wabak:  
Tarih terima:

1. Penyakit:

2. Tarikh Onset/Masa

3. Tarikh/Masa Notifikasi:

4. Tempat Berlaku:

5. Definisi kes:

6. Bilangan orang terlibat:

<table>
<thead>
<tr>
<th>a) Status Kes</th>
<th>b) Kumpulan Umur</th>
<th>Jumlah Kes</th>
</tr>
</thead>
<tbody>
<tr>
<td>-bilangan terdedah:</td>
<td>- bilangan dirawat:</td>
<td>- bilangan masuk wad:</td>
</tr>
<tr>
<td>- Bilangan kes i) suspect:</td>
<td>- bilangan mati:</td>
<td>1-5 tahun</td>
</tr>
<tr>
<td>ii) probable:</td>
<td></td>
<td>6-18 tahun</td>
</tr>
<tr>
<td>iii) confirmed:</td>
<td></td>
<td>19-50 tahun</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;50 tahun</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jumlah keseluruhan</td>
</tr>
</tbody>
</table>

7. Gejala klinikal: (secara ringkas yang merangkumi majoriti pesakit)

8. Hasil siasatan:

a) Epid Curve (masukkan major event):

b) Faktor risiko:

c) Kes indeks/ punca wabak disyakki:

d) Agen etiologi disyakki:

9. Tindakan pencegahan dan kawalan yang diambil:

10. Ulasan Pegawai Kesihatan Daerah:

11. Ulasan Pegawai Epid Negeri:

12. Pegawai Pelapor (Daerah)

   Nama:  
   Jawatan:  
   Alamat Pejabat:  
   Tarih:

12. Pegawai Penerima (Negeri)

   Nama:  
   Jawatan:  
   Alamat Pejabat:  
   Tarih:
CARTA ALIR PENGENDALIAN NOTIFIKASI KES/ WABAK LEPTOSPIROSIS

1. Notifikasi kes (Probable/confirmed) diterima

2. Siasat: Verifikasi kes (Probable/confirmed)

3. Ya

4. Tidak

5. Kes?

6. Tidak → Tamat

7. Ya → Ambil Langkah Pencegahan dan Kawalan

8. Daftar Kes dalam E-notis

9. Wabak?

10. Tidak → Tamat

11. Ya → Notifikasi wabak ke CPRC KKM melalui tel atau sms on call CPRC KKM: 013-6699700

12. Kawalan wabak

13. Hantar Laporan awal wabak (BKP/WABAK/01/2005) dalam masa 24 jam ke CPRC, KKM
   No. Tel: 03-88810 600/700
   No. Fax: 03-88810 400/500
   e-mel: cprc@moh.gov.my

14. Hantar Laporan Harian/ Progress report

15. Hantar Laporan akhir wabak Leptospirosis ke CPRC, KKM dalam tempoh masa sebulan setelah wabak diisyiharkan tamat
BORANG PENILAIAN RISIKO LEPTOSPIROSIS
DI PUSAT-PUSAT REKREASI (BUATAN)

Pejabat Kesihatan Daerah: ________________ Tahun: __________
Pengurus Pusat Rekreasi : Majlis Daerah/Jabatan Perhutanan/Swasta/ Lain: ________________
Tarikh pemeriksaan : ________________

Jenis Pusat Rekreasi:
Nama Taman Rekreasi / Taman Tema/ Kolam Renang: ________________
Lain-lain.Nyatakan : ________________
Lokasi : ________________

<table>
<thead>
<tr>
<th>PERKARA YANG DIPERIKSA</th>
<th>Setiap Soalan Membawa 1 Markah</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YA (mematuhi)</td>
</tr>
</tbody>
</table>

A. PENCEGAHAN SUMBER JANGKITAN LEPTOSPIROSIS (INTERVENTIONS AT INFECTION SOURCES)

1. HALANG RODENT MEMASUKI PUSAT REKREASI (yang ada pagar dan bangunan sahaja) **
   1.1 Pagar adalah berkeadaan baik, tidak rosak dan 'rodent – proof' 1 1
   1.2 Bangunan premis adalah 'rodent – proof' 2 2

2. HALANG RODENT MEMASUKI PREMIS MAKANAN ATAU TEMPAT MINUMAN
   2.1 PREMIS MAKANAN JENIS STATIK (GERAI / RESTORAN)
      a.Stor simpanan makanan:
         • Tempat penyimpanan makanan berkeadaan bersih, teratur, tersusun dan tidak terlalu padat 3 3
         • Terdapat jadual pembersihan yang baik dan pengendalian keluar masuk barang yang baik 4 4
         • Ada sistem ‘rodent- proof’. 5 5
      b.Terdapat aktiviti kawalan rodent 6 6
      c.Tiada kesan rodent 7 7
      d.Tidak mempunyai barang yang tidak diperlukan 8 7
      e.Pengurusan sisa makanan yang baik dan tidak mengundang rodent 9 8

   2.2 PREMIS MAKANAN BERGERAK
      a.Sisa makanan tidak ditinggalkan merata-rata 10 9
<table>
<thead>
<tr>
<th>PERKARA YANG DIPERIKSA</th>
<th>Setiap Soalan Membawa 1 Markah</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YA (mematuhi)</td>
</tr>
<tr>
<td>b. Sisa makanan dimasukkan ke dalam plastik sampah</td>
<td>11</td>
</tr>
<tr>
<td>c. Plastik sampah yang penuh dihantar ke tempat pengumpulan sampah setiap hari</td>
<td>12</td>
</tr>
</tbody>
</table>

3. CEGAH PEMBIAKAN RODENT SEKITAR PUSAT REKREASI

3.1 Secara umum, persekitaran pusat rekreasi adalah berkeadaan bersih           | 13            | 14                   |
3.2 Rumput adalah pendek di sekitar pusat rekreasi                              | 14            | 15                   |
3.3 KEMUDAHAN SANITASI:

a. Ada Tandas
   • Tiada kesan rodent                                                                | 16            | 16                   |
   • Berkeadaan bersih                                                                | 17            | 17                   |
   • Sistem pembuangan yang baik dan kerap                                            | 18            | 18                   |
   • Jadual pembersihan yang baik dan kerap                                          | 19            | 19                   |
   • Sisa tidak melimpah atau ‘backflow’ tidak berlaku                              | 20            | 20                   |

b. Ada Bilik Mandi
   Bilangan mencukupi                                                                | 21            | 21                   |
   Berkeadaan bersih                                                                | 22            | 22                   |

3.4 PENGURUSAN SISA MAKANAN DAN SAMPAH SEKITAR PUSAT REKREASI

a. Bilangan tong sampah;
   • Mencukupi,                                                                       | 24            | 23                   |
   • Tidak Rosak,                                                                     | 25            | 24                   |
   • Bertutup,                                                                       | 26            | 25                   |
   • Mempunyai Plastik Sampah,                                                        | 27            | 26                   |
   • Sampah Tidak Berselerak/Bersepah,                                                | 28            | 27                   |
   • Terdapat Jadual Pengutipan Sampah                                                | 29            | 28                   |

b. Tempat pengumpulan sampah;
   • Bersih                                                                            | 30            | 29                   |
   • Berkeadaan baik dan terurus                                                      | 31            | 30                   |
   • Tiada longgokan sampah di lantai                                                | 32            | 31                   |
   • Mempunyai paip air dan parit bagi urusan pembersihan                            | 33            | 32                   |
   • Pengurusan air ‘leachate’ yang baik dan tidak bertakung                          | 34            | 33                   |
   • Pembersihan dan pembuangan sampah yang kerap                                   | 35            | 34                   |
<table>
<thead>
<tr>
<th>PERKARA YANG DIPERIKSA</th>
<th>Setiap Soalan Membawa 1 Markah</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YA (mematuhi)</td>
</tr>
<tr>
<td>3.5 KEADAAN PERSEKITARAN PUSAT REKREASI</td>
<td></td>
</tr>
<tr>
<td>a. Sumber utama air (inlet) bukan dari punca yang tercemar dan berisiko.</td>
<td>35</td>
</tr>
<tr>
<td>b. Tiada pengaliran air masuk dari punca lain ke pusat rekreasi</td>
<td>36</td>
</tr>
<tr>
<td>c. Pusat rekreasi adalah tidak terdedah kepada matahari [ tiada rintangan daripada daun/ pokok/ rumput atau lalang sekitar pusat rekreasi ]</td>
<td>37</td>
</tr>
<tr>
<td>d. Aliran air tidak tersekat atau bertakung</td>
<td>38</td>
</tr>
<tr>
<td>e. Terdapat perparitan di sekeliling pusat rekreasi bagi mengelakkan pengaliran air permukaan masuk ke dalam pusat rekreasi</td>
<td>39</td>
</tr>
<tr>
<td>f. Sampel air mematuhi parameter fizikal (pH, kekeruhan dan warna)- jika sampel air diambil dan diuji - 'optional'</td>
<td>40</td>
</tr>
<tr>
<td>3.6 PENGURUSAN AIR DI PERMUKAAN (SURFACE WATER)</td>
<td></td>
</tr>
<tr>
<td>a. Sistem pengaliran air di permukaan tidak mengalir masuk ke kawasan air di pusat rekreasi</td>
<td>41</td>
</tr>
<tr>
<td>b. Keadaan parit dan saliran termasuk parit di tepi jalan yang masuk ke kawasan pusat rekreasi (jika ada)</td>
<td></td>
</tr>
<tr>
<td>• Tidak rosak/ pecah/</td>
<td>42</td>
</tr>
<tr>
<td>• Tidak memerangkap sampah</td>
<td>43</td>
</tr>
<tr>
<td>• Tidak tersekat aliran atau bertakung</td>
<td>44</td>
</tr>
<tr>
<td>3.7 PENGURUSAN SISA AIR LIMBAH (SULLAGE)</td>
<td></td>
</tr>
<tr>
<td>a. Sistem pengumpulan sisa yang bersih (Septik atau lubang serapan)</td>
<td>45</td>
</tr>
<tr>
<td>b. Perangkap lemak yang bersesuaian dan berfungsi dengan baik</td>
<td>46</td>
</tr>
<tr>
<td>c. Tempat pengumpulan air limbah yang bersih</td>
<td>47</td>
</tr>
<tr>
<td>d. Tidak berbau busuk</td>
<td>48</td>
</tr>
<tr>
<td>B. PENCEGAHAN TRANSMISI JANGKITAN LEPTOSPIROSIS (INTERVENTIONS AT THE TRANSMISSION ROUTE)</td>
<td></td>
</tr>
<tr>
<td>1. Ada bilik mandi atau 'shower' [ berdekatan pusat rekreasi untuk membasuh badan selepas aktiviti rekreasi]</td>
<td>49</td>
</tr>
<tr>
<td>• Bilangan mencukupi</td>
<td>50</td>
</tr>
<tr>
<td>2. Sumber Air Minum Yang Selamat Disediakan</td>
<td></td>
</tr>
<tr>
<td>• Air Lembaga Air Perak (LAP) yang telah</td>
<td>51</td>
</tr>
<tr>
<td>PERKARA YANG DIPERIKA</td>
<td>Setiap Soalan Membawa 1 Markah</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td></td>
<td>YA (mematuhi)</td>
</tr>
<tr>
<td>dimasak atau air botol</td>
<td></td>
</tr>
<tr>
<td>3. Ada bahan pendidikan kesihatan mengenai pencegahan Leptospirosis disediakan untuk pengunjung seperti pamplet, poster dan sebagainya.</td>
<td>52</td>
</tr>
<tr>
<td>JUMLAH</td>
<td>/52</td>
</tr>
</tbody>
</table>

PERATUS

Catatan:

i. Faktor-faktor kritikal bergantung kepada situasi di negeri masing-masing

ii. Faktor-faktor yang dianggap sebagai faktor kritikal. Pelanggaran 42 faktor kritikal boleh meningkatkan risiko pembiakan rodent, pembiakan bakteria Leptospira serta meningkatkan risiko penularan Leptospirosis.

iii. ** Jika tiada pagar dan bangunan di pusat rekreasi, jumlah maksima markah faktor kritikal ialah 40 faktor sahaja.


Ulasan:

Cadangan Langkah-Langkah Penambahbaikan (guna helai tambahan, jika perlu):

Disediakan oleh: 
Disemak/ disahkan oleh:

................................................... ...........................................................
Tandatangan Pegawai Pemeriksa Tandatangan Peg. Kesihatan Daerah/Peg. Epid. Daerah/PPKPKanan

Tarikh: 

Adaptasi daripada:
2. Borang Pemeriksaan Persekitaran PLKN Bagi Kemudahan Aktiviti Kolam
BORANG PENILAIAN RISIKO LEPTOSPIROSIS
DI PUSAT-PUSAT REKREASI (SEMULAJADI)

Pejabat Kesihatan Daerah: _______________ Tahun: ____________
Pengurus Pusat Rekreasi:Majlis Daerah/Jabatan Perhutanan/ Swasta /Lain_____________
Tarikh pemeriksaan: _____________________

Pusat Rekreasi:
Nama : _____________________________
Lokasi :
Jenis : ( ) Air terjun ( )Sungai
Lain-lain.Nyatakan: ___________________________

<table>
<thead>
<tr>
<th>PERKARA YANG DIPERIKSA</th>
<th>Setiap Soalan Membawa 1 Markah</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YA (mematuhi)</td>
</tr>
</tbody>
</table>

A. PENCEGAHAN SUMBER JANGKITAN LEPTOSPIROSIS (INTERVENTIONS AT INFECTION SOURCES)

1. HALANG RODENT MEMASUKI PREMIS MAKANAN ATAU TEMPAT MINUMAN

1.1 PREMIS MAKANAN JENIS STATIK (GERAI / RESTORAN)
   a. Stor simpanan makanan:
      • Tempat penyimpanan makanan berkeadaan bersih, teratur, tersusun dan tidak terlalu padat 1 1
      • Terdapat jadual pembersihan yang baik dan pengendalian keluar masuk barang yang baik 2 2
      • Ada sistem ‘rodent-proof’. 3 3
   b. Terdapat aktiviti kawalan rodent 4 4
   c. Tiada kesan rodent 5 5
   d. Tidak mempunyai barang yang tidak diperlukan 6 6
   e. Pengurusan sisa makanan yang baik dan tidak mengundang rodent 7 7

1.2 PREMIS MAKANAN BERGERAK
   a. Sisa makanan tidak ditinggalkan merata-rata 8 8
   b. Sisa makanan dimasukkan ke dalam plastik sampah 9 9
   c. Plastik sampah yang penuh dihantar ke tempat pengumpulan sampah setiap hari 10 10

2. CEGAH PEMBIAKAN RODENT SEKITAR AIR TERJUN / SUNGAI

2.1 Secara umum, persekitaran pusat rekreasi adalah 11 11
<table>
<thead>
<tr>
<th>PERKARA YANG DIPERIKSA</th>
<th>Setiap Soalan Membawa 1 Markah</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YA (mematuhi)</td>
<td>TIDAK (tidak mematuhi)</td>
</tr>
<tr>
<td>berkeadaan bersih</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>2.2 Rumput adalah pendek di sekitar air terjun / sungai</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>2.3 KEMUDAHAN SANITASI:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Tandas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Tiada kesan rodent</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>• Berkeadaan bersih</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>• Ada jadual pembersihan</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>• Sistem pembuangan yang bersih</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>• Sisa tidak melimpah atau ‘backflow’ tidak berlaku</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>2.4 PENGURUSAN SISA MAKANAN DAN SAMPAH SEKITAR PUSAT REKREASI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Bilangan tong sampah;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• mencukupi,</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>• tidak rosak,</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>• bertutup,</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>• mempunyai plastik sampah,</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>• sampah tidak berselerak/bersepah,</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>• terdapat jadual pengutipan sampah</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>b. Tempat pengumpulan sampah;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Bersih</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>• Berkeadaan baik dan terurus</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>• Tiada longgokan sampah di lantai</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>• Mempunyai paip air dan parit bagi urusan pembersihan</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>• Pengurusan air ‘leachate’ yang baik dan tidak bertakung</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>• Pembersihan dan pembuangan sampah yang kerap</td>
<td>29</td>
<td>29</td>
</tr>
</tbody>
</table>

B. PENCHEGAHAN TRANSMISI JANGKITAN LEPTOSPIROSIS (INTERVENTIONS AT THE TRANSMISSION ROUTE)

1. Ada tandas atau bilik mandi [ berdekatan kawasan air terjun / sungai untuk membasuh badan selepas aktiviti rekreasi]  | 30 | 30 |  |
| • Bilangan mencukupi  | 31 | 31 |  |

2. Sumber Air Minum Yang Selamat Digunakan Pengunjung  |  |  |  |
| • Air botol atau air yang telah dimasak | 32 | 32 |  |

Ada bahan pendidikan kesihatan mengenai pencegahan Leptospirosis disediakan untuk pengunjung seperti pamphlet, poster dan sebagainya.  | 33 |  |

**JUMLAH**  | / 33  | /33 | / 32**  |

**PERATUS**
Catatan:

i. Faktor-faktor kritikal bergantung kepada situasi di negeri masing-masing

ii. Faktor-faktor yang dianggap sebagai faktor kritikal. Pelanggaran 32 faktor kritikal boleh meningkatkan risiko pembiakan rodent, pembiakan bakteria Leptospira serta meningkatkan risiko penularan Leptospirosis.


Ulasan:

Cadangan Langkah-Langkah Penambahbaikan (guna helaian tambahan, jika perlu):

Disediakan oleh: Disemak/ disahkan oleh:

...................................................  ...........................................................
Tandatangan Pegawai Pemeriksa Tandatangan Peg. Kesihatan Daerah/Peg. Epid. Daerah/PPKP
Tarikh: Tarikh:

Adaptasi daripada:
2. Borang Pemeriksaan Persekitaran PLKN Bagi Kemudahan Aktiviti Kolam
AMARAN!
RISIKO KESIHATAN

RISIKO PENYAKIT BERJANGKIT
SUNGAN, KOLAM, AIR TERJUN DAN LUMPUR MUNGKIN
DICEMARI BAKTERIA ATAU VIRUS ATAU PARASIT
JANGAN MINUM AIR YANG TIDAK DIMASAK ATAU
DIRAWAT
ELAKKAN BERENANG ATAU BERMAIN AIR SEKIRANYA
ANDA LUKA ATAU ADA PENYAKIT KULIT
BERENANG ATAU BERMAIN AIR ATAS RISIKO SENDIRI
DAPATKAN RAWATAN SEKIRANYA TIDAK SIHAT DALAM
TEMPOH 2 MINGGU DARI SEKARANG
JAGA KEBERSIHAN PERSEKITARAN. PERSEKITARAN
YANG KOTOR MENGUNDANG KEHADIRAN PERUMAH
HAIWAN YANG MENINGKATKAN RISIKO PENCEMARAN
KUMAN
UNTUK MAKLUMAT LANJUT, HUBUNGI:
PEJABAT KESIHATAN DAERAH BERHAMPIRAN
(##-############)
WARNING! HEALTH RISK

RISK OF COMMUNICABLE DISEASES
FRESH WATER STREAMS, PONDS AND MUD POSSIBLY CONTAMINATED WITH BACTERIA OR VIRUSE OR PARASITES
DO NOT DRINK UNBOILED OR UNTREATED WATER
DO NOT SWIM OR WADE IF YOU HAVE CUTS OR ABRASIONS
SWIM OR WADE AT YOUR OWN RISK
SEEK TREATMENT IF YOU ARE NOT WELL WITHIN 2 WEEKS FROM NOW
KEEP THE ENVIRONMENT CLEAN AS UNCLEAN ENVIRONEMNT ATTRACT NATURAL ANIMAL HOSTS WHICH INCREASES THE RISK OF GERM CONTAMINATION
FOR MORE INFORMATION, PLEASE CALL: THE NEAREST DISTRICT HEALTH OFFICE (#-##########)