GUIDELINES FOR THE DIAGNOSIS, MANAGEMENT, PREVENTION AND CONTROL OF LEPTOSPIROSIS IN MALAYSIA

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DISEASE CONTROL DIVISION
DEPARTMENT OF PUBLIC HEALTH
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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

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. Anis Salwa Bt. Kamaruddin
Dr. Husna Maizura Bt. Ahmad Mahir
Dr. Junaidi B. Djoharnis
Dr. Muhamad B. Ismail
Tn Hj. Abdul Hamid B. Osman
Cik Ong Chia Ching
Tn Haji Wagimon B. Amat
Tn Hj. Abdul Jamil B. Ali

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. Nazri 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

List Of Annex

1. INTRODUCTION

Leptospirosis is a common public health problem worldwide with an estimated anuual 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 haemorrhagic 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 is 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

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

( ) 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 LEPTOSPIROSIS

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 ≥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 10^{th} 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.

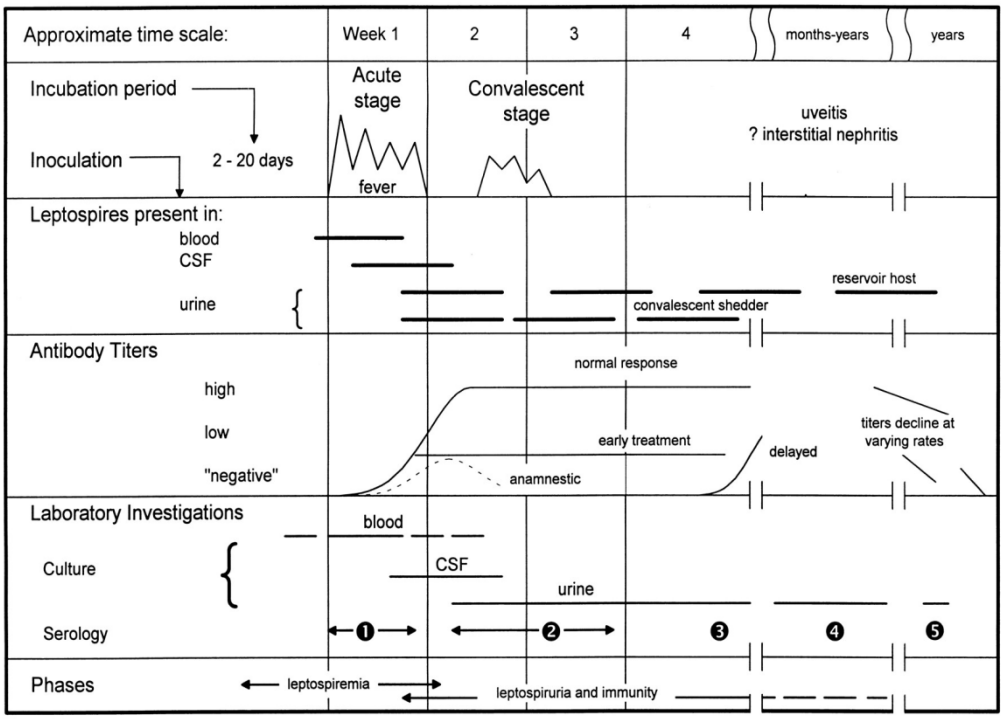

Figure 1: Leptospiremic phases in conjunction with the laboratory methods of diagnosis (4).

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

Preferred	Alternative	Comments
Penicillin G 100000U/ kg/ dose IV 6hourly x 7days	**>8yrs:** Doxycycline 4mg/kg/dose oral 12hourly x 7days **<8yrs:** Ampicillin 75-100mg/kg/dose oral 6hourly x 7days or Amoxicillin 50mg/kg/dose oral 6-8hourly x 7days	**Penicillin:** use in moderate to severe disease caution in impaired renal function Jarisch-Herxheimer reaction has been described in patients with leptospirosis **Doxycycline:** used for only mild disease can cause permanent discoloration of teeth **Ampicillin/Amoxycillin:** 2nd line agent or for pts < 8yrs

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.

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Annex 1

COLLECTION AND TRANSPORTATION OF CLINICAL AND ENVIRONMENTAL SAMPLES FOR LEPTOSPIROSIS

1. Clinical Sample

Table1: Clinical sample Collection and Transportation

Test	Specimen	Container	Storage & Transport condition	Where to send
ELISA or any other rapid immune diagnostic kit	Serum	Plain tube (3 mL)	Ambient. If delay is unavoidable store at 4-8℃.	1. Hospital with facilities or 2. IMR or 3. MKAK (for community outbreak)
MAT	Serum (same sample for ELISA can be used for MAT) A repeat convalescent sample (at least 1 week later) is necessary to confirm cases.	Plain tube (3 mL)	Ambient or 4-8℃ if delay is unavoidable	1. IMR 2. MKAK (for community outbreak)
PCR	[a]Whole blood [b]Mid stream Urine–	EDTA tube (2mL) Sterile plain leak proof container.	Ambient or 4-8℃ if delay is unavoidable Ambient.	1. IMR 2. MKAK (for community outbreak)
[c]Culture	Blood CSF / body fluids Tissue	Heparin tube (4-5 mL) Sterile container Sterile container	Ambient Ambient Ambient	IMR

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 ℃ (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)

Test	Specimen	Container	Transport condition	Where to send
PCR	Intracardiac blood Tissues (brain, lung, liver, heart, kidneys) CSF	EDTA Sterile container Sterile container	Ambient temperature or 4-8℃ if delay unavoidable	IMR
Culture	Blood Tissues, CSF	Heparin tubes. Sterile container	Ambient temperature	IMR
Immunohistochemistry	Tissues Paraffin Blocks or slides with mounted tissue sections (microtomised tissues 4-40 uM)		Ambient temperature	IMR

2. Environmental Sample

Table 3: Environmental Sample Collection and Transportation

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

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 PENSAMPELAN 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 kaki 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*

3. *Bacaan fizikal : pH, suhu, kekeruhan, "clarity" dan warna air perlu diambil dan dicatatkan dalam borang MKAK PER-104B-02 /1 sebelum pensampelan .*

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.*

4. *Turunkan baldi ke dalam sungai/telaga/kolam/tasik dan pastikan talinya tidak masuk tersentuh ke dalam baldi. Kalau boleh bilas baldi dengan air sungai/telaga/kolam/tasik pada kawasan yang hendak disampel. Apabila baldi penuh, naikan ke atas dengan berhati-hati.*

5. *Buka penutup beg steril/botol steril. Isikan air ke dalam beg steril/botol terus daripada baldi.*

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℃ sekiranya kelewatan tidak dapat di elakkan.*

7. *Baldi aluminium hendaklah dibasuh dengan air bersih selepas digunakan. Ulang tatacara ini untuk persampelan di kawasan yang lain.*

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℃ sekiranya berlaku kelewatan.*

IMR/IDRC/BACT/LEPTO/01

Leptospirosis Laboratory Request Form
Bacteriology Unit,
Institute for Medical Research
Jalan Pahang, 50588 Kuala Lumpur **Tel: 03-26162582/2766**

A. REQUESTOR INFORMATION

Hospital: _____ _____

Ward: _____

Date of Admission: ___/___/___

Name of Requesting Doctor: _____

Signature: _____

Tel No: _____

Fax No: _____

B. PATIENT'S INFORMATION

Name: _____

Address: _____

_____

_____

IC No: _____

R/N No: _____

Age: _____ Date of Birth: ___/___/___

Race: ☐ Malays ☐ Chinese ☐ Indian

☐ Others: _____

Sex: ☐ Male ☐ Female

Occupation: _____

C. CLINICAL SUMMARY

Diagnosis date: ___/___/___

Illness duration: _____days

Sign & Symptoms:

- ☐ Fever, duration: _____
- ☐ Chills & rigors
- ☐ Anorexia
- ☐ Headache
- ☐ Retroorbital pain
- ☐ Calf pain
- ☐ Arthralgia
- ☐ Myalgia
- ☐ Conjunctival redness
- ☐ Abdominal pain
- ☐ Cough
- ☐ Hemoptysis
- ☐ Nausea/vomiting
- ☐ Jaundice
- ☐ Diarrhoea
- ☐ Rash
- ☐ Convulsion
- ☐ Hepatosplenomegaly
- ☐ Lymphadenopathy
- ☐ Others: _____

Antibiotic therapy: _____
Date started: _____

D. EXPOSURE

- ☐ Bathing/swimming (where)_____
- ☐ Hunting (where)_____
- ☐ Fishing (where) _____
- ☐ Camping (where) _____
- ☐ Contact with animals (cattle, cow, rodents)

E. SPECIMEN INFORMATION

Date of collection: ___/___/___

- ☐ PCR (2-3 mls blood in EDTA tubes; only for cases with fever less than 10 days, prior to antibiotics)
- ☐ Serum for MAT (send only if leptospirosis rapid test is positive or equivocal)
- ☐ Culture (2-3 mls blood in heparin tubes; for cases prior to antibiotics only)

(For MAT please send second serum samples 2 weeks after first sample)

F. LABORATORY INFORMATION

Date specimen received: ___/___/____

Date test performed: ___/___/____

Result of test:

Verified by: _____

Laboratory Request Form MKA (Clinical) **Annex 1b**

MKAK-BPU-U01

REQUESTOR INFORMATION	
Name :	
Post :	
Address :	
District :	State :
Tel. No. :	Fax No. :
Email :	

Lan No. (*for lab use*):	

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

Name :	Age : Date of Birth :
IC No :	Sex : ψMale ψFemale
Your Reference No. :	Marital Status: ψSingle ψMarried
Address : District : Postcode : State :	Nationality : ψMalaysian ψNon Malaysian : *(Please state country of origin)*
Tel. No :	Occupation :

B. CLINICAL SUMMARY	**C. PURPOSE OF SAMPLING**
Sign and Symptoms :	ψOutbreaks / Cluster Cluster Code: …… ψDiagnostic ψSurveillance Specimen Category : ψProgramme/Projects ψCase ψOthers : ψContact
	D. FOR VACCINE PREVENTABLE DISEASE
Date of onset :	Immunisation status *(for the specified disease)*
Clinical/Provisional Diagnosis :	ψYes Number of Doses : Date of last dose : ψNo

E. SPECIMEN INFORMATION

Type of Specimen	Date and Time of Collection	Date Specimen Received *(for lab use)*

F. TYPE OF TESTS

ψBacterial identification : (culture ± sensitivity)
ψViral Identification : Isoation / Antigen Detection / Nucleic acid
. ψSerology (Specify) :
. ψOthers (Specify) :

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

Verified By : ……..
Date :

NB : Please send request form in duplicate

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

Institusi yang memohon: No Faks: Tandatangan/ cop rasmi:	Tarikh/ masa pengambilan sampel: Lokasi Persampelan: Jenis sampel: Maklumat kes:
Lakaran Kawasan Persampelan/ Kolam: Petunjuk:	

Analisa Parameter Fizikal

ID Sampel	**Masa Persampelan**	**Suhu (^oC)**	**pH**	**Kekeruhan**	**Clarity**	**Warna**	**Catatan**

Tarikh/masa terima sampel:
Nama dan Tandatangan penerima:

Annex 2a

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

Borang Notis: Rev/2010
No. Siri:

NOTIFIKASI PENYAKIT BERJANGKIT YANG PERLU DILAPORKAN

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

A. MAKLUMAT PESAKIT

1. Nama Penuh (HURUF BESAR):

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

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

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

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

4. Jantina: ☐ Lelaki ☐ Perempuan

5. Tarikh Lahir: / /

6. Umur: ☐ Tahun ☐ Bulan ☐ Hari

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

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

9. Alamat Kediaman

10. Alamat Tempat Kerja / Belajar:

B. DIAGNOSIS PENYAKIT

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

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

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

12. Status Pesakit:
☐ Hidup
☐ Mati - -

13. Tarikh Onset: - -

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

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

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

17. Maklumat Klinikal Yang Relevan:

18. Komen:

Annex 2b

C. MAKLUMAT PEMBERITAHU

19. Nama Pengamal Perubatan:

20. Nama Hospital / Klinik dan Alamat:

21. Tarikh Pemberitahuan: - -

.....
Tandatangan
Pengamal Perubatan

Annex 2b

"SCHEDULE
(Regulation 2)
Form
(Regulation 2)
PREVENTION AND CONTROL OF INFECTIOUS DISEASES ACT 1988
PREVENTION AND CONTROL OF INFECTIOUS DISEASES (NOTICE FORM) (AMENDMENT) REGULATIONS 2011

Notification Form: Rev/2010
Serial No:

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):

Accompany by(Mother/Father/Guardian):
(If under age/without Identity Card)

2. Identity Card Number / Travelling Document: ☐ Self ☐ Accompany by
(For Non Citizen)

Hospital/Clinic Reg. Number: Ward:_____ Date of Admission: / /

3. Citizenship:
Citizen
☐ Yes Race/Ethnic:
Sub Ethnic:
(For Aborigines, Native of Sabah/Sarawak)
☐ No Country of origin:
Status of Entry: ☐ Legal ☐ Illegal ☐ Permanent Resident

4. Gender: ☐ Male ☐ Female

5. Date of birth: / /

6. Age: ☐ Year ☐ Month ☐ Day

7. Occupation:_____
(If unemployed, please state self reference)

8. Telephone No.: ☐ Resident ☐ H.phone ☐ Office -
(Contact purposes)

9. Current Address:

10. Address of Employer/School/College/University:

B. DISEASE DIAGNOSIS

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

11. Case detection classification:
☐ Case ☐ Contact ☐ FOMEMA
☐ Screening Test _____

12. Status of patient:
☐ Live/alive
☐ Died - -

13. Date of Onset: - -

14. Laboratory investigation:
Investigation: (i)_____
(ii)_____ (iii)_____
Date of specimen taken: - -

15. Laboratory investigation result:
☐ Positive (_____)
☐ Negative
☐ Pending

16. Diagnosis Status:
☐ Provisional/Suspected
☐ Confirmed
Date of Diagnosis - -

17. Relevant Clinical Information:

18. Comment:

C. NOTIFIER

19. Name of Medical Practitioner:

20. Name and address of Hospital/Clinic:

21. Date of Notification: - -

.....
Signature of Medical Practitioner

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:

Demam,
Sakit kepala
mengigil
Sakit otot
Sakit otot betis (*Calf pain*)
Sakit Sendi
Malaise
Sakit abdomen
Loya
Muntah
Diarrhea
Batuk
Sesak nafas
Lain-lain, nyatakan:_____

Gejala Klinikal:

Ruam
Jaundis
Radang mata (*Conjunctival suffusion)*
Lain-lain, nyatakan:_____

14. Adakah kes ini berkaitan dengan wabak ? Ya Tidak Tidak diketahui
15. Ujian Diagnostik makmal:

Nama Ujian	**Tarikh Pensampelan**	**Nama Makmal**	**Keputusan**		**Catatan**
			Disahkan (*Confirmed*)	***Probable***	
MAT					
PCR					
ELISA					
Rapid test					

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:

Nama	Hubungan	No. Tel	Catatan

(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

Annex 4

CONTOH DATABASE KES POSITIF LEPTOSPIROSIS TAHUN ……..

NEGERI:

Annex 4

MAKLUMAT PESAKIT							Kemasukkan Ke Hospital						JENIS KES*						
NO	NAMA	UMUR	JANTINA	WARGA NEGARA	BANGSA	DAERAH	Ya	Tidak	HOSPITAL /KLINIK KESIHATAN	Tarikh Kemasukkan *	Tarikh Onset	Tarikh Notifikasi	SPORADIK	WABAK	NAMA MAKMAL UJIAN DIBUAT	JENIS UJIAN	STATUS PESAKIT (HIDUP/ MATI)	Klasifikasi kes (Probable/ confirmed)	PUNCA JANGKITAN
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			

Disediakan oleh:

Jawatan:

Tarikh:

Disemak oleh:

Jawatan:

Tarikh:

Kes Positif bermakna :

1. kes Probable (diagnosa 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 5
BKP/WABAK/01/2005

BORANG LAPORAN AWAL WABAK PENYAKIT

Sumber laporan wabak: Tarikh terima:

<table>
<tr><td colspan="5">1. Penyakit:</td></tr>
<tr><td colspan="2">2. Tarikh Onset/ Masa</td><td></td><td colspan="2">3. Tarikh /Masa Notifikasi:</td></tr>
<tr><td colspan="5">4. Tempat Berlaku:</td></tr>
<tr><td colspan="5">5. Definisi kes:</td></tr>
<tr><td colspan="5">6. Bilangan orang terlibat:</td></tr>
<tr><td colspan="2">a) Status Kes</td><td>b) Kumpulan Umur</td><td colspan="2">Jumlah Kes</td></tr>
<tr><td rowspan="6">-bilangan terdedah:

- Bilangan kes
i) suspect:

ii) probable:

iii) confirmed:</td><td rowspan="6">- bilangan dirawat:

- bilangan masuk wad:

-bilangan mati:</td><td>0-1 tahun</td><td>Lelaki</td><td>Perempuan</td></tr>
<tr><td>1-5 tahun</td><td></td><td></td></tr>
<tr><td>6-18 tahun</td><td></td><td></td></tr>
<tr><td>19-50 tahun</td><td></td><td></td></tr>
<tr><td>>50 tahun</td><td></td><td></td></tr>
<tr><td>Jumlah keseluruhan</td><td></td><td></td></tr>
<tr><td colspan="5">7. Gejala klinikal : (secara ringkas yang merangkumi majoriti pesakit)</td></tr>
<tr><td colspan="5">8. Hasil siasatan:

a) Epid Curve (masukkan major event):

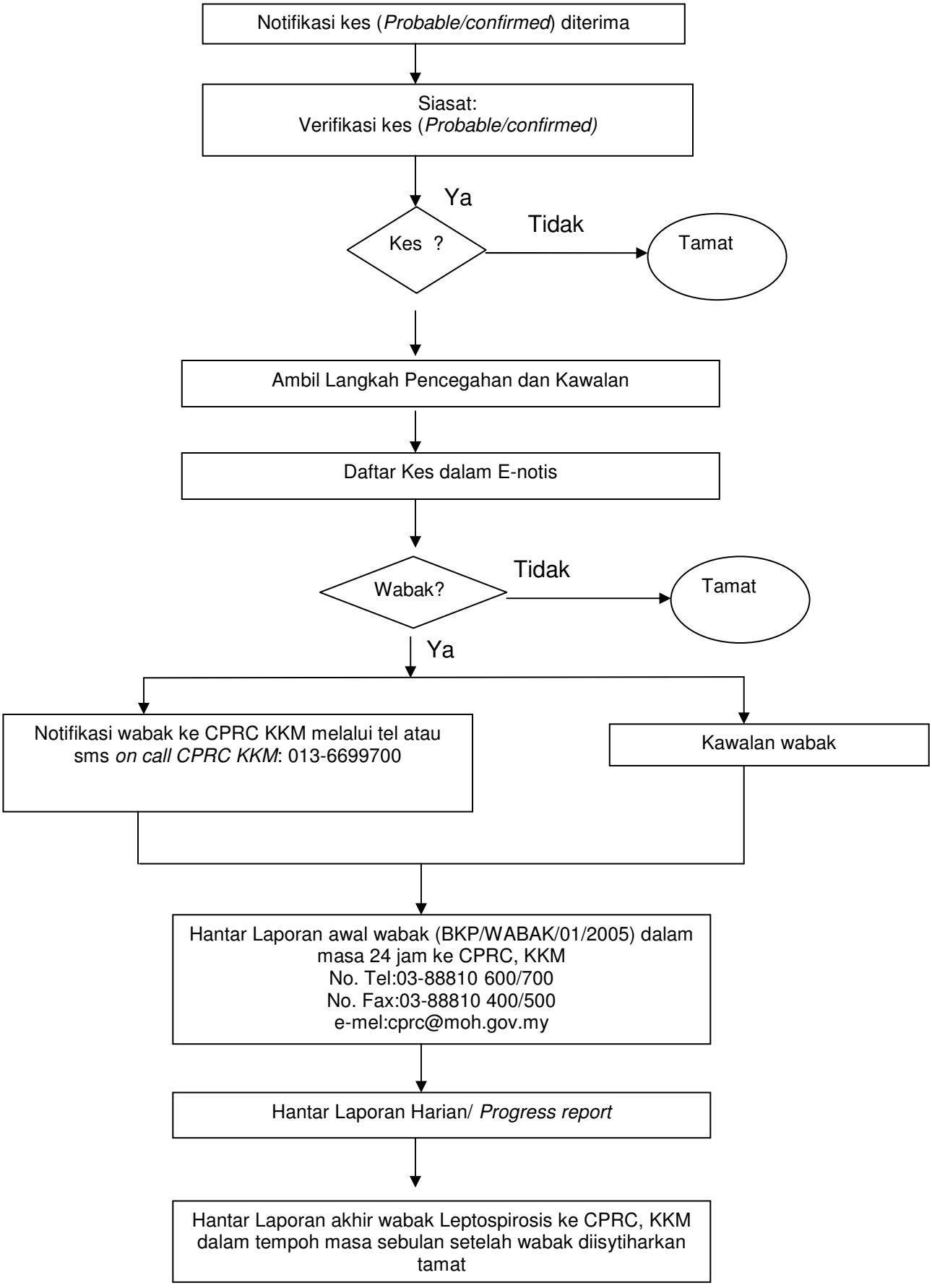
b) Faktor risiko:

c) Kes indeks/ punca wabak disyakki:

d) Agen etiologi disyakki:</td></tr>
<tr><td colspan="5">9. Tindakan pencegahan dan kawalan yang diambil:</td></tr>
<tr><td colspan="5">10. Ulasan Pegawai Kesihatan Daerah:</td></tr>
<tr><td colspan="5">11. Ulasan Pegawai Epid Negeri:</td></tr>
<tr><td colspan="3">12. Pegawai Pelapor (Daerah)
Nama:
Jawatan:
Alamat Pejabat:
Tarikh:</td><td colspan="2">12. Pegawai Penerima (Negeri)
Nama:
Jawatan:
Alamat Pejabat:
Tarikh:</td></tr>
</table>

Annex 6

CARTA ALIR PENGENDALIAN NOTIFIKASI KES/ WABAK LEPTOSPIROSIS



Annex 7a

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 :_____

PERKARA YANG DIPERIKSA	**Setiap Soalan Membawa 1 Markah**		
	YA (mematuhi)	**TIDAK (tidak mematuhi)**	**KRITIKAL***
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

PERKARA YANG DIPERIKSA	Setiap Soalan Membawa 1 Markah		
	YA (mematuhi)	TIDAK (tidak mematuhi)	KRITIKAL*
2.2 PREMIS MAKANAN BERGERAK			
a.Sisa makanan tidak ditinggalkan merata-rata	10		9
b.Sisa makanan dimasukkan ke dalam plastik sampah	11		10
c.Plastik sampah yang penuh dihantar ke tempat pengumpulan sampah setiap hari	12		11
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	15		
• Tiada kesan rodent	16		16
• Berkeadaan bersih	17		17
• Sistem pembuangan yang bersih	18		18
• Jadual pembersihan yang baik dan kerap	19		19
• Sisa tidak melimpah atau 'backflow' tidak berlaku	20		20
b. Ada Bilik Mandi	21		
Bilangan mencukupi	22		21
Berkeadaan bersih	23		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

PERKARA YANG DIPERIKSA	Setiap Soalan Membawa 1 Markah		
	YA (mematuhi)	TIDAK (tidak mematuhi)	KRITIKAL*
3.5 KEADAAN PERSEKITARAN PUSAT REKREASI			
a.Sumber utama air (*inlet*) bukan dari punca yang tercemar dan berisiko.	35		35
b.Tiada pengaliran air masuk dari punca lain ke pusat rekreasi	36		36
c.Pusat rekreasi adalah tidak terdedah kepada matahari [tiada rintangan daripada daun/ pokok/ rumput atau lalang sekitar pusat rekreasi]	37		37
d.Aliran air tidak tersekat atau bertakung	38		38
e.Terdapat perparitan di sekeliling pusat rekreasi bagi mengelakkan pengaliran air permukaan masuk ke dalam pusat rekreasi	39		39
f.Sampel air mematuhi parameter fizikal (pH, kekeruhan dan warna)- jika sampel air diambil dan diuji - 'optional'	40		
*3.6 PENGURUSAN AIR DI PERMUKAAN (*SURFACE *WATER)*			
a.Sistem pengaliran air di permukaan tidak mengalir masuk ke kawasan air di pusat rekreasi	41		
b.Keadaan parit dan saliran termasuk parit di tepi jalan yang masuk ke kawasan pusat rekreasi (jika ada)			
• *Tidak rosak/ pecah/*	42		
• *Tidak memerangkap sampah*	43		
• *Tidak tersekat aliran atau bertakung*	44		
3.7 PENGURUSAN SISA AIR LIMBAH (SULLAGE)			
a.Sistem pengumpulan sisa yang bersih (Septik atau lubang serapan)	45		
b.Perangkap lemak yang bersesuaian dan berfungsi dengan baik	46		
c.Tempat pengumpulan air limbah yang bersih	47		
d.Tidak berbau busuk	48		
B. PENCEGAHAN TRANSMISI JANGKITAN LEPTOSPIROSIS (INTERVENTIONS AT THE TRANSMISSION ROUTE)			
1. Ada bilik mandi atau 'shower' [berdekatan pusat rekreasi untuk membasuh badan selepas aktiviti rekreasi]	49		40
• Bilangan mencukupi	50		41
2. Sumber Air Minum Yang Selamat Disediakan			
• Air Lembaga Air Perak (LAP) yang telah dimasak atau air botol	51		42

PERKARA YANG DIPERIKSA	Setiap Soalan Membawa 1 Markah		
	YA (mematuhi)	TIDAK (tidak mematuhi)	KRITIKAL*
3. Ada bahan pendidikan kesihatan mengenai pencegahan Leptospirosis disediakan untuk pengunjung seperti pamplet, poster dan sebagainya.	52		
JUMLAH	**/ 52**	**/52**	**/42***
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.
iv. Catatkan 'T.B.' atau 'Tidak Berkaitan' jika perkara dinilai, tiada di pusat rekreasi tersebut.

Ulasan:

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

Disediakan oleh:

.....
Tandatangan Pegawai Pemeriksa

Tarikh:

Disemak/ disahkan oleh:

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

Tarikh:

Adaptasi daripada:

1. 'World Health Organization: Human Leptospirosis: Guidance For Diagnosis, Surveillance & Control'; Control of Leptospirosis', 2003.
2. Borang Pemeriksaan Persekitaran PLKN Bagi Kemudahan Aktiviti Kolam
3. Borang Penilaian Risiko Leptospirosis Di Pusat Rekreasi (Buatan) Jabatan Kesihatan Negeri Perak.

Annex 7b

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: _____

PERKARA YANG DIPERIKSA	**Setiap Soalan Membawa 1 Markah**		
	YA (mematuhi)	**TIDAK (tidak mematuhi)**	**KRITIKAL***
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

PERKARA YANG DIPERIKSA	Setiap Soalan Membawa 1 Markah		
	YA (mematuhi)	TIDAK (tidak mematuhi)	KRITIKAL*
2. CEGAH PEMBIAKAN RODENT SEKITAR AIR TERJUN / SUNGAI			
2.1 Secara umum, persekitaran pusat rekreasi adalah berkeadaan bersih	11		11
2.2 Rumput adalah pendek di sekitar air terjun / sungai	12		12
2.3 KEMUDAHAN SANITASI:			
a. Tandas			
• Tiada kesan rodent	13		13
• Berkeadaan bersih	14		14
• Ada jadual pembersihan	15		15
• Sistem pembuangan yang bersih	16		16
• Sisa tidak melimpah atau '*backflow*' tidak berlaku	17		17
2.4 PENGURUSAN SISA MAKANAN DAN SAMPAH SEKITAR PUSAT REKREASI			
a. Bilangan tong sampah;			
• mencukupi,	18		18
• tidak rosak,	19		19
• bertutup,	20		20
• mempunyai plastik sampah,	21		21
• sampah tidak berselerak/bersepah,	22		22
• terdapat jadual pengutipan sampah	23		23
b.Tempat pengumpulan sampah;			
• Bersih	24		24
• Berkeadaan baik dan terurus	25		25
• Tiada longgokan sampah di lantai	26		26
• Mempunyai paip air dan parit bagi urusan pembersihan	27		27
• Pengurusan air 'leachate' yang baik dan tidak bertakung	28		28
• Pembersihan dan pembuangan sampah yang kerap	29		29
B. PENCEGAHAN 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.
iii. Catatkan 'T.B.' atau 'Tidak Berkaitan' jika perkara dinilai, tiada di pusat rekreasi tersebut.

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/PPKPKanan
Tarikh:	Tarikh:

Adaptasi daripada:

1. 'World Health Organization, Human Leptospirosis: Guidance For Diagnosis, Surveillance & Control'; Control of Leptospirosis', 2003.
2. Borang Pemeriksaan Persekitaran PLKN Bagi Kemudahan Aktiviti Kolam
3. Borang Penilaian Risiko Leptospirosis Di Pusat Rekreasi (Semula Jadi) Jabatan Kesihatan Negeri Perak.

AMARAN!

RISIKO KESIHATAN

RISIKO PENYAKIT BERJANGKIT

SUNGAI, 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
(##-##########)