

*National Action Plan*  
*For the Prevention and Control of*  
*Plague*

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**Ministry Of Health and Wellness**

**26 November 2014**

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**This is a working document and may be subject to amendments**

## **Acronyms**

<i>CDCU</i>	<i>Communicable Diseases Control Unit</i>
<i>CDC</i>	<i>Centers for Disease Control and Prevention, Atlanta, USA</i>
<i>COMBI</i>	<i>Communication for Behaviour Impact</i>
<i>HCV</i>	<i>Hepatitis C Virus</i>
<i>HCW</i>	<i>Health Care Workers</i>
<i>HIV</i>	<i>Human Immunodeficiency Virus</i>
<i>MHO</i>	<i>Medical &amp; Health Officer</i>
<i>PHEIC</i>	<i>Public Health Emergency of International Concern</i>
<i>PH&amp;FSI</i>	<i>Public Health and Food Safety Inspector</i>
<i>PPE</i>	<i>Personal Protective Equipment</i>
<i>SOP</i>	<i>Standard Operating Procedures</i>
<i>WHO</i>	<i>World Health Organization</i>

# Table of Contents

Executive Summary .....	6
1. INTRODUCTION .....	7
1.1 Background .....	7
1.2 Definition .....	8
1.3 Transmission .....	8
1.4 Clinical Manifestations .....	8
2. RATIONALE.....	9
3. FRAMEWORK OF THE PREPAREDNESS PLAN .....	10
PART ONE Preparedness Phase.....	11
A. Response Planning and Coordination .....	11
A.1 Setting up of a Task Force.....	11
A.2 Setting up of an Multisectoral Committee .....	12
A.3 Linkage with the Ministry of Agro Industry and Food Security.....	12
B. Control at Ports of Entry .....	12
B.1 Active surveillance of incoming passengers .....	12
B.2 At the Airport .....	13
B.3 At the Seaport .....	13
B.4 Hotels and guest houses and community-level surveillance at residence .....	14
C. Surveillance of incoming passengers from affected countries.....	14
D. Outbreak Investigation and Response.....	15
E. Hospital preparedness.....	16
E.1 Provision of isolation facilities .....	16
E.2 Provision of quarantine facilities .....	16
E.3 Stockpiling of Personal Protective Equipment (PPE) .....	16
E.4 Stockpiling of drugs, equipment and consumables .....	17

E.5	Development of Specific protocols.....	17
E.6	Training of staff.....	18
E.7	Arrangements for logistic support .....	18
E.8	Disposal of dead bodies .....	18
F.	Laboratory preparedness .....	18
G.	Rodent Control .....	20
H.	Monitoring of pets.....	24
I.	Flea Surveillance and control .....	24
J.	Communication and Sensitization.....	24
PART TWO Mitigation Phase.....		26
A.	Introduction of the disease by incoming passenger(s) from Madagascar.....	26
a.	Isolation of suspected cases .....	27
b.	Diagnosis.....	27
c.	Clinical management of suspected cases .....	27
d.	Contact tracing.....	27
e.	Quarantine Measures .....	28
f.	Disease surveillance .....	28
g.	Communication and Sensitization .....	28
B.	Localized spread of the disease to close contacts .....	29
C.	Spread of the disease at community level .....	29
PART THREE Recovery phase.....		31

## **ANNEXES**

- Annex 2      Composition of Multisectoral Committee
- Annex 2a     Multi-Sectoral Committee: Role and Responsibilities of Stakeholders
- Annex 3      Screening of Passengers at the Airport
- Annex 4      Protocol for handling of suspected cases at the Port
- Annex 5a     Case Definition
- Annex 5b     Questionnaire for Plague 2014
- Annex 6      Wearing and removal of PPE
- Annex 7      Stock piling of PPE
- Annex 8a     Standard precautions
- Annex 8b     Hand Hygiene
- Annex 9      Collection of specimen in suspected cases
- Annex10     Treatment of Plague
- Annex 11     Disposal of the bodies
- Annex 12     Guidelines for Rodent Control through Integrated Pest Control Management
- Annex 13     Post Exposure Prophylaxes
- Annex 14     Case Definition for Community-Based Surveillance

## Executive Summary

Plague is an acute, infectious, and potentially epidemic disease caused by the plague bacillus, *Yersinia pestis*. It spreads from one rodent to another by flea parasites and it is introduced in the human body through the bite of an infected flea.

The present outbreak of plague in Madagascar was notified to WHO on 4 November 2014 by the Ministry of Health of Madagascar. The first case was identified on 31 August 2014 and the patient died on 3 September 2014.

As of 16 November 2014, a total of 119 cases of plague have been confirmed, including 40 deaths. Only 2% of the reported cases are of the pneumonic form.

In response to this event in Madagascar and in anticipation of the probability of the spread of this disease to the Republic of Mauritius, a National Action Plan has been prepared. The aim of this plan is to prevent and control Plague in the Republic of Mauritius, including Rodrigues and the Outer Islands. It provides strategic orientations for actions to be taken for the prevention and containment of Plague.

The preparedness plan consists of three main parts; the preparedness phase, the mitigation phase and the recovery phase. The overall strategies include:

- A. Response planning and coordination
- B. Control at ports of entry
- C. Surveillance of incoming passengers from affected countries
- D. Rodent Control
- E. Monitoring of pets
- F. Flea surveillance and control
- G. Hospital preparedness
- H. Laboratory preparedness
- I. Contact tracing
- J. Communication and sensitization

This document also outlines three possible scenarios following introduction of the disease in the Republic of Mauritius, and the actions to be taken during each scenario.

The three possible scenarios are:

1. Introduction of the disease by incoming passenger/s from Madagascar;
2. Localized spread of the disease to close contacts; and
3. Widespread transmission of the disease at community level.

The Action Plan for the prevention and control of Plague in Mauritius is based on the recommendations of the World Health Organisation and Centres for Disease Control and Prevention, Atlanta.

## **1. INTRODUCTION**

### ***1.1 Background***

Natural foci of wild rodent plague are found in many parts of the world, including central, eastern and southern Africa, South America, the western part of North America and in large areas of Asia. Epidemics and outbreaks of plague occur when the disease spreads from wild rodents into populations of rats (genus *Rattus*) that live near human habitation, and are more likely in areas that have poor sanitary conditions and large populations of rats.

Plague is one of the oldest diseases known to man, and still remains a threat to human health. Since 1990 the disease has occurred in several African countries, including Botswana, the Democratic Republic of Congo, Madagascar, Mozambique and countries in East Africa. There has been an increase in the annual incidence of human cases of plague since the beginning of the 90's and the disease has reappeared in countries where it had not been reported for decades. In 2007, seven countries reported 2021 cases with 156 deaths. Among these, 99.6% of cases were reported from Africa.

Because of its high case-fatality rate and the epidemic potential of this disease, plague is designated as a Class I notifiable disease and thus is subject to International Health Regulations. These regulations require that all suspected cases be reported to, and investigated by public health authorities, and that confirmed cases be reported to the World Health Organization (WHO).

On 4 November 2014, the Ministry of Health of Madagascar notified WHO of an outbreak of plague. The first case, a male from Soamahatamana village in the district of Tsiroanomandidy, was identified on 31 August 2014. The patient died on 3 September 2014.

As of 16 November 2014, a total of 119 cases of plague have been confirmed, including 40 deaths. Only 2% of these reported cases are of the pneumonic form.

Cases have been reported in 16 districts of seven regions. Antananarivo, the capital and largest city in Madagascar, has also been affected with 2 recorded cases of plague, including 1 death. There is now a risk of a rapid spread of the disease due to the city's high population density.

## **1.2 Definition**

Plague is an acute bacterial zoonosis, caused by *Yersinia pestis*, a gram-negative coccobacillus belonging to the Enterobacteriaceae family. It primarily affects wild rodents.

It manifests in one or more of the three following clinical forms:

- Bubonic plague
- Septicemic plague
- Secondary pneumonic plague

## **1.3 Transmission**

The most common mode of transmission of *Y. pestis* to humans is by the bite of infectious fleas. Less frequently, infection can be spread by direct contact with infectious body fluids or tissues while handling an infected animal. Humans bitten by an infected flea usually develop a bubonic form of plague, which is characterized by a bubo, i.e. a swelling of the lymph node draining the site of the flea bite.

If the bacteria reach the lungs, pneumonia may develop (pneumonic plague), which is then transmissible from person to person through infected droplets spread by coughing and sneezing.

## **1.4 Clinical Manifestations**

Initial symptoms of bubonic plague appear 7–10 days after infection. The typical incubation time following exposure through direct contact or the bite of an infected flea is two to six days. For primary plague pneumonia, the incubation period is usually shorter (two to four days).

In humans, the initial symptoms of plague include fever, chills, muscle aches, a feeling of weakness and, commonly, swollen and tender lymph nodes (called “buboes”).

Thereafter, depending on the form the disease takes, as described below, additional symptoms and signs appear.



Plague occurs in three main clinical forms:

- **Bubonic plague** is the form that usually results from the bite of infected fleas. Lymphadenitis typically develops in the lymph nodes that drain the site of the initial infection, which are most often located in the inguinal, axillary, or cervical region. Swelling, pain and suppuration of the lymph nodes produce the characteristic plague buboes. This is the most common clinical form of the disease.
- **Septicaemic plague** may develop subsequently to bubonic plague or occur in the absence of lymphadenitis as primary systemic plague. The bacteria invades and continues to multiply in the bloodstream, and dissemination of the infection to different parts of the body results in meningitis, endotoxic shock and disseminated intravascular coagulation.
- **Pneumonic plague** may result from secondary infection of the lungs by the plague bacilli, causing severe pneumonia. In cases of pneumonic plague, direct spread of infection to others occurs by respiratory droplets, causing primary pulmonary plague in the recipients, and can lead to outbreaks or epidemics.

Without prompt and effective treatment, 50–60% of cases of bubonic plague are fatal, but if diagnosed early, bubonic plague can be successfully treated with antibiotics. Untreated septicaemic and pneumonic plagues are invariably fatal; patients can die within 24 hours after infection. The mortality rate depends on how soon treatment is started, but is always very high.

## 2. RATIONALE

The rationale for this preparedness plan is to enable relevant authorities to be prepared to mitigate and manage plague should it occur in Mauritius. The strategies outlined in this plan aim at preventing introduction of plague in Mauritius, at reducing morbidity and mortality in case of an outbreak or epidemic and at minimizing socio-economic disruption in the country.

### **3. FRAMEWORK OF THE PREPAREDNESS PLAN**

The preparedness plan consists of three main parts; the preparedness phase, the mitigation phase and the recovery phase.

The preparedness phase is covered in part one which details all the preparedness steps to be taken to prevent the introduction of the disease in Mauritius. The main objectives are planning and coordination, assessing the hospital capacity, procuring the necessary drugs, supplies and reagents, capacity building for active sentinel surveillance and sensitizing the relevant stakeholders.

The mitigation phase is covered in part two which deals with actions to be undertaken during an eventual epidemic in order to mitigate disease burden and deaths due to the disease. The main objectives are enhanced surveillance for active case detection, contact tracing and isolation to break the chain of transmission and clinical management of cases to reduce morbidity and mortality.

The recovery phase is covered in part three which deals with post-epidemic phase that is aimed at averting future epidemics. This will consist of brainstorming on lessons learnt with all stakeholders and psychological support for the public to use the health services by dispelling fear and myths.

## **PART ONE Preparedness Phase**

The health sector must be in a state of readiness to cope with the eventual importation and public health consequences of plague.

The main objectives are planning and coordination, assessing the hospital capacity, procuring the necessary drugs, supplies and reagents, capacity building for active sentinel surveillance and sensitizing the relevant stakeholders. These objectives are covered based on the following strategies:

- A. Response planning and coordination**
- B. Control at ports of entry**
- C. Surveillance of incoming passengers from affected countries**
- D. Outbreak Investigation & Response**
- E. Hospital preparedness**
- F. Laboratory preparedness**
- G. Rodent Control**
- H. Flea surveillance and control**
- I. Monitoring of pets**
- J. Communication and sensitization**

### ***A. Response Planning and Coordination***

The planning and coordination process will be directed towards developing effective mechanisms for mobilization and deployment of required resources to implement the National Preparedness Plan.

#### **A.1 Setting up of a Task Force.**

A Task Force, chaired by the Director General Health Services, has been set up at the Headquarters of the Ministry of Health & Wellness.

The terms of reference of this Task Force are to:

- prepare and trigger the health sector response to plague;
- review and update operational plans and protocols;
- act as an advisory body to policy makers
- monitor implementation of activities
- carry out surveillance activities and ensure a proper feedback mechanism;
- ensure the availability of additional resources, wherever appropriate

The composition of the Task Force is at **Annex 1**.

### **A.2 Setting up of an Multisectoral Committee**

Coordination between the health and non-health sectors is critical to define the role, functions and responsibilities of each stakeholder, to achieve harmonization and minimize duplication, redundancy or contradictory activities. The Multisectoral Committee will be headed by the Honourable Minister of Health and Wellness. Members of this Committee will include all relevant stakeholders who have collaborated with the Ministry during previous outbreaks of communicable diseases.

The Committee will enroll the support of the Disaster Risk Reduction and Management Centre in the event there is widespread transmission of the disease in the country. The composition of the Multisectoral Committee is at **Annex 2**.

### **A.3 Linkage with the Ministry of Agro Industry and Food Security**

In order to deal with the threat of Plague to Mauritius, the Ministry of Health and Wellness has already constituted a Task Force and a Multisectoral Committee and has formulated a draft action plan on Plague. The Task Force will work with the Ministry of Agro Industry and Food Security and the Wildlife Foundation to look at issues relating to the presence of the plague bacillus in rodents and other mammals in Mauritius, importation of animal products from the affected countries and transmission of the bacteria from humans to the animals.

## ***B. Control at Ports of Entry***

Procedures are already in place at the two entry points in Mauritius, namely, the airport and seaport, for health profiling of incoming passengers. At these entry points, the health and travel status of individual incoming passengers and crew-members is reviewed by health inspectors working at these border posts. The protocol for handling of suspected cases at the airport is at **Annex 3** and at the seaport at **Annex 4**. The case definition for active case detection during surveillance is at **Annex 5a**.

### **B.1 Active surveillance of incoming passengers**

Surveillance for active case detection among incoming passengers and crew-members will be undertaken at:

1. Airport
2. Seaport
3. Hotels and guest houses and community-level surveillance at residence

The existing protocols for control at Port and Airport will be followed. These are:

## **B.2 At the Airport**

- a.** All incoming aircrafts are boarded by the Senior Public Health and Food Safety Inspector or Public Health and Food Safety Inspector to verify the contents of the General Declaration of the Pilot in Command, check whether there is any case of illness on board and whether the aircraft has been disinfected prior to its landing.
- b.** Incoming aircrafts are randomly inspected to ascertain whether disinsection has been properly carried out and to check the environmental health standards of the aircraft.
- c.** If all health/ environmental health conditions are being met with, the aircraft is granted the necessary health clearance for disembarkation of incoming passengers, luggage and cargo.
- d.** All incoming passengers are currently being screened twice, once prior to proceeding toward immigration counters and then at the health counter.
- e.** Screening procedures prior to immigration include verification of all passports in order to ascertain the countries through which the passenger has recently travelled, and a temperature check. The health declaration forms of all passengers are collected at the health counter.
- f.** The list of incoming passengers is transmitted to the respective health offices for follow up purposes.
- g.** All incoming food cargo by air is examined and then released if food safety norms are met with at PATS or Customs' Counters at the airport.
- h.** The Public Health & Food Safety Inspectorate has the right to carry out any disinfection/ disinsection/ deratting procedures of incoming aircrafts/ luggage/ cargo in any circumstances warranting the same.

## **B.3 At the Seaport**

- a.** Twelve hours before the arrival of a vessel in the port, the Master of that vessel emails a Special Health Declaration form informing the Port Health Office of the state of health of all persons on board.
- b.** The Master also submits the following documents:
  - Maritime Declaration of Health

- Ship Sanitation Control Exemption Certificate or Ship Sanitation Control Certificate;
- Crew list;
- Vaccination list;
- List of Ports of call.

If the ship or any crew or any passenger is coming from any high risk country, Health clearance will be granted subject to certain conditions.

- c. When the vessel is berthed at Quay the Public Health and Food Safety Inspector ensures that rat guards are in place.
- d. On board the vessel the Public Health and Food Safety Inspector verifies the original of the above mentioned documents.
- e. Temperature check of crew members is carried out.
- f. A random Inspection is carried out in the galley, kitchen and dry store for food sanitation survey and to detect the presence of rat droppings.
- g. Crew/passengers are placed under health surveillance if they come from countries listed for health surveillance
- h. When the Public Health and Food Safety Inspector is satisfied that the ship will not result in the introduction or spread of disease in Mauritius, free pratique (health clearance is granted). If he is not of that opinion he may refuse pratique and thereupon the ship shall be deemed to be in quarantine.
- i. If the ship sanitation control certificate is not valid a detailed inspection of the vessel is carried out to determine rat infestation. If rat infestation is found, the Master of the vessel is asked to perform deratting before issue of a ship sanitation control certificate. Deratting can be performed by the health team on a vessel with a Gross Registered Tonnage (GRT) of up to 1000T. If the GRT is above 1000T the Master is requested to take adequate measures to control the level of rat population on board and to do deratting in the next port of call offering such service.

#### **B.4 Hotels and guest houses and community-level surveillance at residence**

Once the lists of incoming passengers from Madagascar and other high risk countries are received at the respective Regional Health Offices, follow up of these passengers will be carried out by staff of the regional offices as detailed in Section C for surveillance.

### ***C. Surveillance of incoming passengers from affected countries***

Members of the staff at the Port and Airport Health Offices will verbally inform the respective Regional Health Offices and the respective Principal Public Health and Food Safety Inspector at the earliest, of incoming passengers from Madagascar and other high risk countries. In addition a list of incoming passengers will be transmitted by facsimile to the respective health offices for monitoring purposes.

The monitoring process consists of the following steps:

- a. A first visit will be carried out by a Public Health and Food Safety Inspector (PH&FSI) within twenty four (24) hours of the passenger list being faxed to the respective Regional Health Offices. If the passenger is at site of work, the PH&FSI of the Regional Health Office in whose catchment area the work site is located, in will carry out this visit.
- b. During the first visit the passenger will be briefed about plague, namely the signs and symptoms, mode of transmission, and precautionary measures to be taken.
- c. An information flyer will be handed over to the passenger, wherein the latter is provided with contact numbers of the Health Authorities and establishments in case of any queries or notification of any change in health status.
- d. A follow up visit will be carried out after three (3) days from the first visit. In between visits, contact will be established by telephone on a daily basis for six days.
- e. In the event that the passenger arrives on a Saturday, Sunday or Public Holiday, the Senior PH&FSI of the Airport and Port Health Office will inform the Principal PH&FSI of the respective Regional Health Offices by telephone, and the latter will make necessary arrangements so that the passenger is contacted by phone within 24 hours, followed by personal contact on the next working day.
- f. The passenger will be visited personally on the 6<sup>th</sup> day following the second visit.

#### ***D. Outbreak Investigation and Response***

The guiding principles on which outbreak investigation and response are based are as follows:

- Notification of the suspected case to the sanitary authorities;
- Isolation of the case;
- Laboratory confirmation of the case;
- Management and treatment of the case;
- Determination of the source of infection;
- Identification of contacts and quarantine measures implemented in case of Pneumonic plague;

- Additional epidemiological and environmental investigations;
- Protection of contacts with chemoprophylaxis , wherever appropriate;
- Disinsection and disinfection of premises and the immediate environment of a confirmed case;
- Active surveillance of close contacts and at community level;
- Passive case detection in health institutions ;
- Rodent and flea control;
- Data collection, compilation and analysis to assess the magnitude of the outbreak.

## ***E. Hospital preparedness***

The overall objective is to ensure that the hospital admitting cases of Plague is fully prepared to manage such patients, while establishing specific protocols and guidelines for the identified procedures.

This process will include the following:

### **E.1 Provision of isolation facilities**

Isolation wards have been set up on the first floor of Souillac Hospital (now known as a district hospital) with four bays, each consisting of three beds for male and female patients, with all amenities and facilities.

### **E.2 Provision of quarantine facilities**

A quarantine bay has been identified on the same floor and this bay is physically separated from the isolation bays and has a partition in the middle to separate male and female patients. Presently this bay can accommodate a total of four beds. The purpose is to monitor the health status of persons who have been in unprotected contact with confirmed cases.

A small space has been provided for Nursing Staff inside the bay to enable monitoring of the quarantined patients.

### **E.3 Stockpiling of Personal Protective Equipment (PPE)**

Health workers treating patients with Pneumonic Plague are at higher risk of infection than other groups. During an outbreak a number of important actions will help to reduce



or stop the spread Plague and protect health workers and others in the health-care setting. These actions are called “standard and other additional precautions”.

Examples of PPE include gloves, gowns, Goggles and masks.

Proper use of PPEs is essential for proper protection is to be achieved. The sequence of donning and removal is specific, and staff posted in the isolation wards will be trained accordingly.

A protocol for the wearing and removal of PPEs is at **Annex 6**.

In line with the preparedness plan of other communicable diseases, provisions have been made to keep a buffer stock of PPEs. A list of these items is at **Annex 7** .

#### **E.4 Stockpiling of drugs, equipment and consumables**

Specific drugs are required for the treatment of Plague. Treatment is specific and symptomatic. An adequate stock of medications, including intravenous fluids, analgesics and antibiotics.

Medical equipment and consumables will include ventilators, suction apparatus, cardiac monitors, intravenous cannulas and syringes.

#### **E.5 Development of Specific protocols**

In view of the specific nature of Plague and its high fatality rate in case of Pneumonic Plague, handling of patients and corpses requires specific procedures. These procedures need to be spelt out as clear protocols and guidelines for all those concerned.

In this respect, protocols and guidelines have been prepared for the following:

1. Infection prevention and control (**Annex 8 a & b**)
2. Procedures for laboratory testing (**Annex 9**)
3. Clinical management of cases (**Annex 10**)
4. Handling of dead bodies and burial procedures(**Annex 11**)

## **E.6 Training of staff**

With a view to ensuring strict compliance to Protocols and Guidelines, training of staff and relevant stakeholders will be undertaken as appropriate.

## **E.7 Arrangements for logistic support**

Logistic support in the local context will consist of providing transport facilities for the following:

1. Transport of staff on night shift;
2. Transfer of suspected cases from the airport to the isolation facility at a designated hospital/health institution;
3. Transport for mobile team for assessment of suspected cases at community level;
4. Transfer of suspected cases detected at community level to the isolation facility;
5. Transfer of waste from isolation facility to incineration site.

Special provisions will be made for cases of Pneumonic Plague:

1. the driver and attendant to be separated from a suspected case during transfer;
2. wearing of PPEs for accompanying staff;
3. blended vehicle for transfer of waste; and
4. decontamination procedures for the transport vehicles

The objective of safe burial is to minimize risk of transmission of Plague to staff, family members and the local community during handling, transporting and burying the deceased.

## **E.8 Disposal of dead bodies**

The protocol for disposal of dead bodies is **at Annex 11**

## ***F. Laboratory preparedness***

At the Bacteriology Laboratory in Victoria Hospital, testing is carried out on clinical samples and on rodent livers from rats sent by officers of the Rodent Control Unit.

- **Clinical samples**

For isolation and identification of *Y.pestis* in clinical samples the following tests can be carried out at the Central Health Laboratory:

- **Culture**

A confirmatory diagnosis of plague can be made in the laboratory by the isolation of *Yersinia pestis* from cultures of lymph node aspirate (bubo), blood cultures and respiratory tract specimens in cases of pneumonic plague. *Y.pestis* grows on routine media, and colonies are visible after 48 hours of incubation. Identification with commercial identification kits can take another 24 hours.

From samples which may contain normal flora such as sputum, *Yersinia* selective agar can also be used and this is available at the Central Health Lab. The plague Laboratory of l'Institut Pasteur de Madagascar (IPM) is a WHO collaborating laboratory for plague. This laboratory has agreed to carry out testing of any suspect isolate sent to it for confirmation free of charge, as provision of this service forms part of the responsibilities of a WHO collaborating laboratory.

- **Microscopy**

A presumptive diagnosis may be made by demonstrating bipolar-staining Gram-negative bacilli on microscopy of smears of lymph node aspirates (or sputum in cases of pneumonic plague). However, caution is required with interpretation as false positives are not unusual.

- **Rapid test**

In 2003 the Institut Pasteur in Madagascar developed a rapid diagnostic test for both pneumonic and bubonic plague antigens that was pilot tested by health workers in 26 sites in Madagascar. The tests were highly successful - results appeared after 15 minutes instead of the usual 15 days; the test was sensitive, reliable and easy to use at the patient's bedside. This dipstick test which detects F1 antigen in infected fluids is being used in the field for rapid diagnosis. The Ministry of Health & Wellness is trying to procure these Rapid Test kits.

Serologic testing by Enzyme Immuno Assay (EIA) to confirm the diagnosis has also been developed by IPM but usually requires a convalescent sample 4-6 weeks after the onset of the disease. Reagents are not available at CHL. Contacts with IPM have been made for procuring reagents.

The Ministry of Health & Wellness is also contemplating the possibility of introducing PCR testing for confirmatory diagnosis of plague.

Procedures which will be used for collection and transport of specimens to the bacteriological laboratory is at **Annex 9**

## TESTING ON RODENTS

Liver tissue specimens are sent for culture to the CHL and these are processed for isolation of *Y.pestis* in a biosafety cabinet.

### ***G. Rodent Control***

The control of rodents is an important part of prevention of plague and other diseases transmitted by these animals.

The three main pillars of the integrated rodent control strategy are:

1. Elimination of Food Sources
2. Elimination of Harbourages
3. Utilisation of Rodenticides

There is a Rodent Control Unit at the Ministry of Health & Wellness.

The function of Rodent Control Unit is to eliminate rats and control diseases transmitted by them, such as Leptospirosis and Plague. The work is performed by means of trapping and placing rodenticides.

The staff of the Rodent Control Unit consist of:

- 1 Ag Senior Supervisor Rodent Control
- 1 Supervisor Rodent Control (on contract basis)
- 4 Rodent Control Attendants
- 17 Acting Rodent Control Attendants

#### ➤ **Trainee Rodent Control Attendants**

#### **Activities:**

- Rodent control is performed daily in the Port Area and once a week at the Airport. Rodent control is performed daily in hospitals, once weekly in medi-clinics and Area

Health Centres, once fortnightly in CHC and other public buildings on request. Rodent Control is also performed at Central Prisons and BSMHCC after normal working hours. Dead carcasses are incinerated in hospitals.

- Live rats are trapped and then dissected for removal of organs and collection of fleas. The liver is sent to the Bacteriology department of the Central laboratory for examination and exclusion of plague bacilli. Since January 2014, 74 samples have been sent to laboratory. Rat fleas are forwarded to the Entomological laboratory for determination of species and flea index.
  - Enquiry is conducted into cases of Leptospirosis reported by medical practitioners. The residence of patients is treated with Rodenticide or Rat glue, followed by sensitisation of the household members.
- In the preparedness phase, rodent control activities will be reinforced. The frequency of visits at the airport will be increased to twice a week.

The help of other stakeholders such as the Ministry of Local Government and Local Authorities, Agro-Industry & Food Safety and Ministry of Environment and Sustainable Development will be sought for environmental sanitation procedures and elimination of rodent breeding places.

The public will be educated about elimination of food sources and about environmental cleanliness in and around the dwellings.

## OPERATIONAL PLAN FOR RODENT CONTROL

The Ministry of Health & Wellness with the participation of the various stakeholders namely the Municipalities, District Councils, the Ministry of Environment & Sustainable Development, the Private Sector, the Mauritius Ports Authority, the Airports of Mauritius Ltd, the Civil Aviation Department and the Air Mauritius will be embarking on an aggressive deratting exercise throughout the whole island starting with the Port and Airport Area.

A special Task Force chaired by the Director Health Services has been set up for the National Deratting Program.

The strategy to be adopted which will (i) Prioritize the Port Area and (ii) Have an encircling strategy starting from a focal point outside the city of Port Louis, namely Pailles from the south, Vallee des Prêtes from the East, Roche Bois from the North and Grande Riviere Nord Ouest from the west moving towards the Harbour in such a manner so as to encircle and circumscribe the City area within a pre-determined lapse of time, and (iii) Move outwards from Port Louis towards Plaine Wilhems,

North, and all other directions. The same strategy will be applied for the Airport and regions around the Airport.

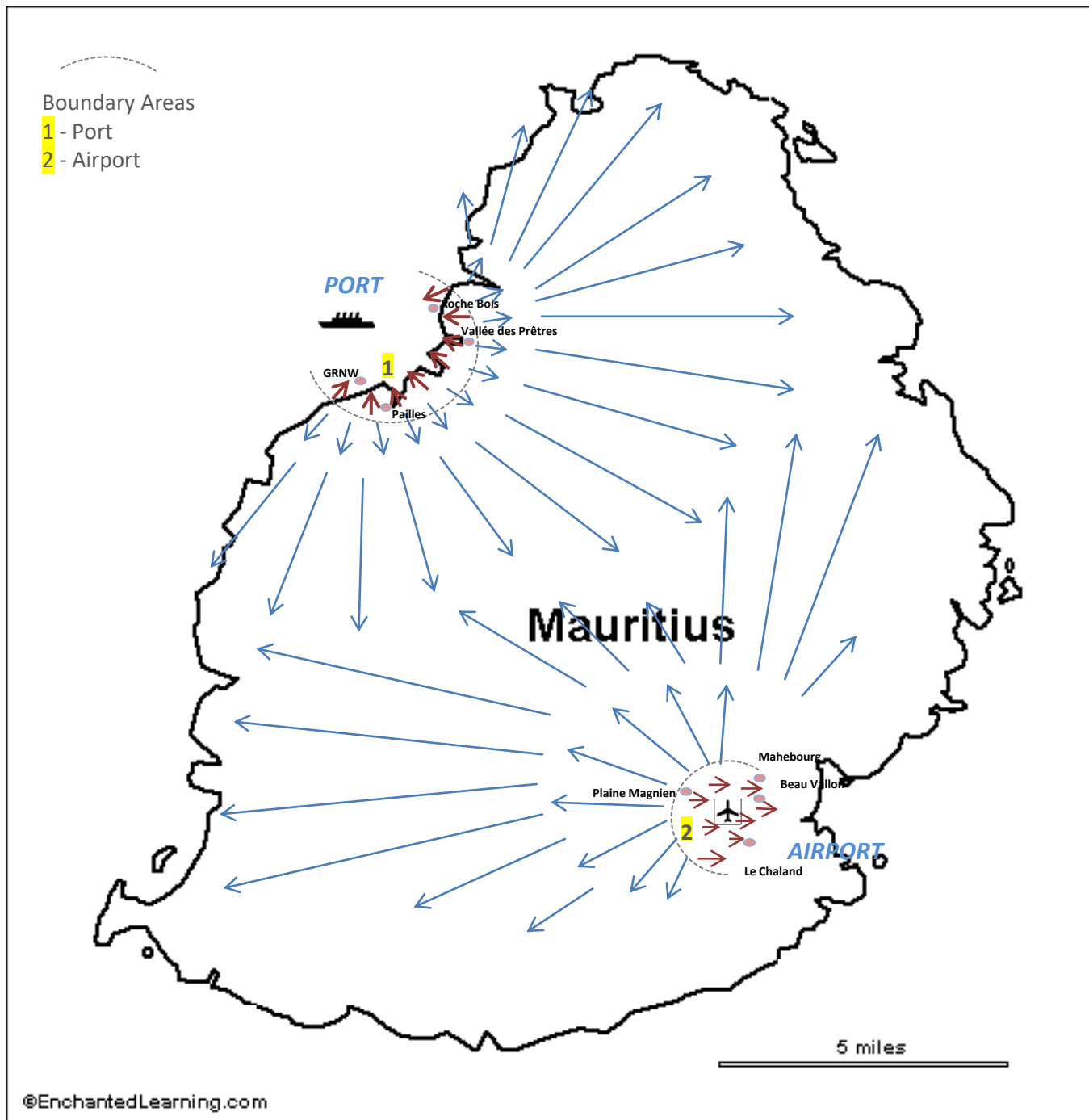
This exercise will be extended over the whole island to ensure that all the localities have been effectively targeted.

The participation of the Private Sector is of prime importance especially as regards to Sensitization.

There will be massive sensitization and awareness program to raise public awareness on preventive measures to be adopted to keep Mauritius a Plague-Free Island through an Integrated Pest Control Management Program.

Besides all active measures which will be taken to prevent the disease, the Ministry will also reinforce its actions by rigorously applying the various legislations, namely the Public Health Act, the Environment Protection Act, the Local Government Act and other relevant legislations to ensure that the nation is safeguarded against this deadly disease.

# OPERATIONAL PLAN FOR DERATTING AROUND THE PORT AND AIRPORT AS WELL AS THROUGHOUT THE ISLAND



Guidelines for Rodent Control have been prepared at the Ministry of Health & Wellness, and are at **Annex 12**.

## ***H. Monitoring of pets***

Monitoring of pets is a critical element because these animals can come into contact with infected rats and other rodents and thus transmit plague to humans. The help of the Ministry of Agro-Industry & Food Safety is being sought.

### ***I. Flea Surveillance and control***

Fleas are important vectors of disease in humans. The most important disease resulting from flea bites is plague. Fleas are small, wingless insects that, in the adult stage, feed on the blood of mammals and birds. The legs of the adult fleas are long with long coxae, which allow it to jump distances many times its own body length, thus moving effectively from host to host.

Although some have common names referring to hosts, most fleas are not very specific feeders. For instance, two common species, the cat flea, *Ctenocephalides felis*, and the dog flea, *Ctenocephalides canis*, are parasitic on cats, dogs, humans, and other hosts. Similarly, the human flea, *Pulex irritans*, attacks humans, dogs, cats, rats, horses, and other animals.

In a good Rodent Control and/or Plague Surveillance Programme, it is imperative to have a perfect knowledge of the rodents and flea population dynamics and biology. There is an ongoing collaboration between the Rodent Control Unit and the Vector Biology & Control Division for surveillance and control of fleas. Fleas, collected in 70%-80% alcohol, are brought to the Vector Biology & Control Division for identification. These fleas are processed and/or mounted and examined microscopically with the help of Identification Keys as provided in established reference books. Collected fleas are kept, prior to mounting, in small glass tubes containing 70-80% alcohol; they can best be stored indefinitely in this way.

The Vector Biology and Control Division has the capacity for testing the susceptibility of fleas to insecticides.

## ***J. Communication and Sensitization***



Strategic communication is a well-planned and well-coordinated means of passing well-designed messages from an individual or institution to its identified stakeholders or general public at the right time, in the right quantity and to achieve well-defined objectives.

The overall objective of communication is to sensitize stakeholders including media, public, and professional partners and to advocate for community support and collaboration while at the same time informing the public about the measures being taken by authorities.

The topics addressed will include:

- plague, its transmission, signs and symptoms and treatment;
- precautionary measures
- environmental modifications to reduce the amount of food and shelter available to rodents;
- applications of insecticides to home, recreational, and work environments when plague has been detected in local animal or flea populations;
- insecticidal treatment of pets;
- avoidance of sick or dead animals.

The following strategies will be used:

1. Press releases about the disease and the measures taken to prevent the introduction of the disease in the country, through written, audiovisual and electronic media. These will be reviewed and updated with regular bulletins.
2. Targeted radio and television programmes;
3. Counselling of travellers on precautionary measures through the International Vaccination Centre and through the travel agencies;
4. Distribution of case definition to doctors, in both public and private sectors;
5. Preparation and distribution of leaflets on plague and preventive measures;
6. Informing Government on a regular basis.

## **PART TWO Mitigation Phase**

This part deals with actions to be undertaken during an eventual epidemic in order to detect cases and contacts and break the transmission chain, and also to mitigate disease burden and deaths due to the disease. The main objectives are enhanced surveillance for active case search, contact tracing and isolation of cases and contacts, and clinical management of cases to reduce morbidity and mortality.

Three possible local scenarios can be envisaged for the above objectives:

- A. Introduction of the disease by incoming passenger/s from Madagascar and other high risk countries;**
- B. Localized spread of the disease to close contacts; and**
- C. Spread of the disease at community level.**

### ***A. Introduction of the disease by incoming passenger(s) from Madagascar***

This scenario provides for a case that is detected in an incoming passenger who has travelled to Madagascar or any other high risk country where plague is endemic and where there is transmission of plague.

Such a case can be detected in the following circumstances:

1. at the terminal of the Airport or Port;
2. At community level.

The purpose of control measures during this phase will be to prevent secondary cases.

Actions will include:

- a.** Isolation of suspected cases;
- b.** Diagnosis;
- c.** Clinical management of suspected cases;
- d.** Contact tracing;
- e.** Quarantine measures;
- f.** Disease surveillance; and
- g.** Communication and sensitization.

#### **a. Isolation of suspected cases**

If a case is detected at the Port, a Senior Medical and Health Officer from Dr. A.G. Jeetoo Hospital will be sent to the port area to assess the case, given that there is no doctor physically present at the port. Consideration will be given to the posting of a doctor to the port, as and when required.

If a case is detected in the community, the Regional Public Health Superintendent will organize a team at the Regional Hospital in collaboration with RHD/Duty Manager for the initial assessment of the patient at his place of residence. All suspected cases will be transferred to a designated hospital/health institution for testing and treatment.

#### **b. Diagnosis**

This will be carried out by testing at the Central Health Laboratory as per procedure outlined in **Annex 9**

#### **c. Clinical management of suspected cases**

Treatment will be administered as per guidelines at **Annex 10**

#### **d. Contact tracing**

Systematic contact tracing will be undertaken by close questioning of suspected or confirmed cases with a view to assessing the risk of exposure of close contacts.

A person who has come in contact within a closed space (e.g. room, vehicle, barrack, jail) with a suspected pneumonic plague patient during the 2 days prior to the development of symptoms in the suspected patient until 2 days after the suspected pneumonic plague patient has started appropriate antimicrobial treatment.

A close contact will also be a person with suspected exposure to *Y. pestis*-infected fleas (e.g. closed community of a suspected case), to a *Y. pestis*-infected mammal or to *Y. pestis* bacilli in a laboratory.

Follow up of contacts will be carried out for a period of 7 days following exposure.

This process will entail identification of contacts through questioning and interviews of suspected or confirmed cases, from hospital records or information available from other relevant and reliable sources.

Post exposure prophylaxis is recommended for persons with known exposure to Plague such as a close contact of a pneumonic Plague patient or direct contact with infected body fluids and tissues. The duration of post exposure prophylaxis is for seven days.

### **Annex 13**

As this exercise is of prime importance for interrupting the chain of transmission and requires extreme mobilisation of resources, it is imperative that full support of relevant stakeholders and active community participation be obtained.

#### **e. Quarantine Measures**

Quarantine measures will be applied for contacts of cases of pneumonic plague, either in the form of home quarantine or hospital quarantine.

#### **f. Disease surveillance**

Data on confirmed and suspected cases will be collected on a daily basis and compiled with a view to monitoring the trend of the outbreak in terms of time, place and person. The purpose of this surveillance will be to monitor and evaluate and review the public health strategies.

#### **g. Communication and Sensitization**

In accordance with IHR, the WHO will be notified about the number of imported cases.

Communications will aim at informing the authorities and the public at large about the evolution of the situation. It will involve:

- Sensitization and awareness programmes targeting close contacts and family members on precautionary measures to be taken;
- Informing the Government on a regular basis;
- Issuing regular press releases for the written media, radio and television;
- Distribution of pamphlets to specific pre-identified target groups such as co-workers, school mates and close relatives.
- Informing the private health sector through special correspondence as per agreement signed between the Ministry and the sector.

## ***B. Localized spread of the disease to close contacts***

In the event that there is further spread of the disease in the community all the above-mentioned measures will be reinforced with a view to controlling the spread of the disease in the community at large and to localize the disease in a specific geographical area.

The Task Force and the Multisectoral Committees will meet to review the situation and advise on the way forward.

Additional staff will be mobilized as rapid response teams in order to enhance contact tracing and identification of potential suspected cases at the level of the community.

The case definition used for surveillance purposes in the community is available at **Annex 5a**.

In this particular scenario, epidemiological links should be established with a confirmed case with a view to ensuring that all detected cases are linked with this index case or are secondary to other cases.

The existing case notification form for communicable diseases will be used for notification purposes which is **at Annex 14**.

## ***C. Spread of the disease at community level***

In the event that there is further spread of the disease in the community measures will be taken to minimize the health and social impact thereof while at the same time preventing spread to other regions.

In this respect apart from enhancing above-mentioned measures, it is recommended that an ecological and environmental audit be carried out for predicting the future course of epizootics and identifying areas of high risk for humans. Information should be collected on predominant vegetation types and the amount of local land surface covered by each vegetation type, roads, railways, airports, and seaports, land use patterns (agricultural, residential, industrial, other), types of dwellings present and whether these dwellings and associated food storage areas or other man-made sites provide food and harbourage for rodents.

Flea and rodent control programmes implemented as a result of human plague case investigations should be described with an evaluation of their success.

In this phase, active participation of the community and other stakeholders will be primordial to control the further spread of the disease.

## **PART THREE Recovery phase**

An outbreak will be declared over only after a period of 12 days after the detection of the last case.

An assessment of the whole event will be carried out, in terms of its impact on human health and the persistence of the bacteria in wild rodents, teaks and other animals in the country is ongoing.

Surveillance activities will be ongoing among human beings, teaks and animals.

Awareness campaigns will be maintained to ensure that the communities will be able to detect any early signal of resurgence.

Rodent and flea control programmes will be sustained, concurrently with on going cleaning campaigns.

***Composition of Multi Sectoral Committee***

1. Hon. Minister of Health & Wellness (**Chairperson**)
2. Senior Chief Executive
3. Permanent Secretaries of Ministry of Health & Wellness
4. Director General Health Services
5. Officer in Charge, World Health Organization (Local Office)
6. All Directors Health Services
7. All Regional Public Health Superintendents
8. Director, Pharmaceutical Services
9. Consultant in Charge, Central Health Laboratory
10. Adviser, Central Health Laboratory
11. Adviser for Disaster Management
12. Advisers in Epidemiology
13. Health Promotion Coordinator
14. Director Nursing
15. Director Public Health & Food Safety
16. SHIEC Officer
17. Public Health & Food Safety, CDCU
18. Prime Minister's Office (External Communication)
19. Permanent Secretary, Ministry of Education and H.R
20. Permanent Secretary, Ministry of Agro-Industry and F. S.
21. Permanent Secretary, Ministry of Local Government and Outer Islands
22. Permanent Secretary, Ministry of Tourism and Leisure
23. Commissioner of Police
24. Commander, Special Mobile Force
25. Director General, National Disaster Risk Reduction and Management Centre
26. Director, Government Information Services
27. The Secretary-General, Mauritius Chamber of Agriculture
28. The Chief Executive Officer, AHRIM



29. The Director, Mauritius Export Association (MEXA)
30. The Director, PSSA
31. The Director, Joint Economic Council
32. The President, Pharmaceutical Association of Mauritius
33. The President, Mauritius Employers' Federation
34. President, Private Clinics' Association
35. President, Private Medical Practitioners Association
36. President, Private Medical Laboratories Association
37. Representative of MACOSS

Other members will be co-opted as when required.

**Multi-Sectoral Committee**

**Role and Responsibilities of Stakeholders**

The Multi-Sectoral Committee will coordinate and monitor the preventive measures that need to be taken regarding plague.

Ministry of Environment and Sustainable Development	<ul style="list-style-type: none"> <li>(i) Support sensitization and cleaning campaigns; and</li> <li>(ii) Enforce appropriate pieces of Legislation.</li> </ul>
Ministry of Local Government and Outer Islands & Local Authorities	<ul style="list-style-type: none"> <li>(i) Reinforce rodent control activities in all Public places, with emphasis on market places and drains;</li> <li>(ii) Support cleaning campaign with a particular focus on bare lands and river banks;</li> <li>(iii) Ensure timely collection of domestic waste; and</li> <li>(iv) Carry out sensitization campaigns.</li> </ul>
Ministry of Agro-Industry and Food Security	<ul style="list-style-type: none"> <li>(i) Carry out surveillance in wild animals, mostly rodents, bats as well as domestic animals;</li> <li>(ii) Sensitization of food producers (poultry industry, agricultural workers); and</li> <li>(iii) Monitor importation of animals from plague affected countries.</li> </ul>
Ministry of Tourism and Leisure	<ul style="list-style-type: none"> <li>(i) Support the national awareness campaigns;</li> <li>(ii) Sensitize hotels on the need to identify suspected cases of plague; and</li> <li>(iii) Maintain the environment rodent free.</li> </ul>
Ministry of Education and Human Resources and  Ministry of Tertiary Education, Science, Research and Technology	<ul style="list-style-type: none"> <li>(i) Support the awareness campaigns in educational institutions ;</li> <li>(ii) Ensure a clean environment within the premises of educational institutions; and</li> </ul>

	(iii) Ensure implementation of rodent control measures in educational institutions.
Ministry of Social Security , National Solidarity and Reform Institutions  Ministry of Gender Equality, Child Development and Family welfare	Support awareness campaigns
The Private Health Institutions  Private Medical Practitioners	(i) Detect and notify any suspected case; (ii) Ensure a rodent free environment in all private health institutions; and (iii) Support the awareness campaigns.
Joint Economic Council / Private Sector Organisations	Participate and establish a link with their respective public organisations and departments with regard to sensitization campaigns and dissemination of information to their respective stakeholders, personnel and the community at large; and ) Provide support to and participate in the various Task Forces.

### 3.1 Screening of Passengers at the Airport

All passengers arriving from all international flights are being screened by Public Health & Food Safety officers while queuing up before the immigration counter. Their passports are being verified to see whether they have transited in or travelled to any of the Plague infected countries within the last ten days and their Health Declaration Forms are also checked. They are questioned about their health status. Any traveler who has visited any infected country recently and reporting sick would be channeled to a dedicated office in the arrival lounge. The airport medical team (Airport medical doctor and nurse) will take a detailed history and assess the patient after which the sick passenger will be transferred through a fast track to an ambulance and sent to a designated hospital/ health institution. A nursing officer will accompany the patient to a designated hospital/health institution if deemed necessary.

Passengers identified as suspect cases of Plague at the health counter will be assessed by the Airport Medical Officer in a dedicated office of the Arrival Lounge at the airport.

An assessment will be made after taking a proper history of symptoms and any risk of exposure to Plague in the last ten days. The symptomatic passenger will follow the fast track for evacuation to the designated hospital/ health institution Isolation Ward. .

The patient will be admitted for appropriate investigations and treatment

The Medical staff and nursing staff will wear full Personal Protective Equipment to make a clinical assessment and care of the patient in the isolation room. The Medical Specialist on call for the isolation ward will be informed to attend to the patient.

**4.1 PROTOCOL FOR HANDLING OF SUSPECTED CASES AT THE PORT**

- (i) At the Port, in the event there is a suspected case of Plague on board a ship, it should be berthed at an isolated quay. The Duty quarantine officer will inform the Regional Public Health Superintendent of the region during working hours to arrange for a Medical Team wearing full Personnel Protective Equipment to visit and transfer the patient to the Isolation Ward at a designated hospital/health institution.
- (ii) After working hours, the duty manager of the hospital to be informed, to arrange for a Medical Team wearing full Personal Protective Equipment to visit and transfer the patient to the Isolation Ward at a designated hospital/health institution;
- (iii) Contacts to be identified by Public Health & Food Safety Inspectors with the help of crew members in the event of Pneumonic Plague
- (iv) In the case of Pneumonic Plague, the patient will wear a mask.
- (v) All asymptomatic close contacts, who would have been in contact with a case of Pneumonic Plague will receive Prophylaxis treatment by the Regional Medical Superintendent of the region.

**Case Definition****5.1 Suspected Case**

Any person with history of exposure to infected rodents/animals or humans and /or evidences of flea bites , and/ or residence in or travel to a known endemic focus within the previous ten days and presenting with the following symptoms:

- Fever and chills
- Headache
- Malaise
- Severe Weakness/Prostration
- Sore throat/ Pharyngitis
- Cervical and/ or Regional Lymphadenitis
- Breathing difficulties

**5.2 Probable case**

Clinically compatible case with either of the following:

- Detection of elevated antibody titre to Yersinia pestis fraction (F1) in a patient's sample.
- Detection of Yersinia pestis fraction (F1) in a clinical specimen by fluorescent assay
- PCR detection of Y. pestis in bubo aspirate, blood or sputum
- Microscopic evidence of Gram -negative or Wayson or Giemsa bipolar coccobacilli from bubo, blood or sputum samples.

**5.3 Confirmed case**

Clinically compatible case with either of the following:

- Isolation of Yersinia pestis from a clinical specimen
- Fourfold or greater change in serum antibody titre to Yersinia pestis F1 antigen in paired serum samples.

Questionnaire for Plague 2014

Surname: ----- Name.....

Nationality.....

Age: -----Date of birth.....

Sex: Male  Female

Occupation.....

Date of arrival..... Flight number.....

Country of original embarkation.....

Country working in at present.....Duration of stay.....

Address in the country of work.....

Country/Countries travelled to during the past month.....

Specific regions visited.....

Address in Mauritius: -----

Telephone Number: -----Home..... Mobile.....

Past Medical History-----

Present Symptoms

Fever: Yes  No  Chills/Rigors: Yes  No

Swollen painful glands : Yes  No  Sore throat: Yes  No

Weakness/ Malaise: Yes  No

Aching muscles or joints: Yes  No  Cough: Yes  No

Breathing difficulties: Yes  No  Nausea/ Vomiting: Yes  No

Diarrhoea: Yes  No  Abdominal pain: Yes  No

Date and time of onset of symptoms: -----

If attended any health facility: Yes            No            If Yes, name of facility.....

**History of Exposure:**

To rats: Yes  No       To other animals: Yes  No  specify if yes, -----  
----

To biting insects/ fleas: Yes  No

Living with other mates/relatives/parents: Yes  No

Any sickness reported amongst relatives, co-workers or domestic staff or flatmates: Yes  No

**General clinical condition of the suspected case:**

**Any Remarks**-----

**Name of attending health officer**-----

**Signature**.....

**Date**.....

**I certify that the above information is correct.**

**Name**-----

**Signature**-----



### ***Isolation Ward***

The Isolation Ward is located on the first floor of New Souillac Hospital (formerly Male Isolation Ward), now being used as a District Hospital. The isolation ward is provided with a changing room, kitchen, and toilet with bathroom for staff on the right side of the corridor before the Central Nursing Station.

The ward has 5 bays. Four bays are reserved for isolation and one bay for quarantine. The four isolation bays are completely separated from the quarantine bay with separate accesses.

#### **Isolation Bays**

A. The first two isolation bays are equipped with facilities for ventilator machines. The first bay has been earmarked for male patients and the second bay for female patients. Each bay can accommodate three beds with ensuite toilet and bathroom. There is also provided a nursing station and an anteroom in each bay. The anteroom will be used by staff for removal of personal protective equipment and hand washing after leaving the patient's room.

In the patient's room each bed will be provided with a dedicated thermometer, stethoscope, automatic blood pressure apparatus, hand sanitizer (alcohol hand rub) and a covered pedal bin lined with double plastic bags. The mattress to be covered by disposable plastic sheet or an impermeable mattress cover.

The room will also have a sink with sensor taps and automatic liquid soap dispenser and paper towels for hand drying.

B. There are two other bays one for female and one for male patients each with three beds, but without facilities for ventilation machines. They are also provided each with a nursing station, an anteroom and ensuite toilet and bathroom for patients.

Total no. of beds in isolation bays:  $6 + 6 = 12$

## **Quarantine Bay**

The quarantine bay is physically separated from the isolation bays and has a partition in the middle to separate male and female patients. On one side to the left inside the bay, a small space will be provided for Nursing Staff monitoring the quarantined patients. The quarantine bay will accommodate two beds for male patients and two beds for female patients.

Total no. of beds in quarantine bay: 4

## **Anteroom**

The anteroom will have a sink with sensor taps and automatic soap dispensers and provision for paper towels for hand-drying. Also an automatic alcohol hand rub dispenser will be available for hand hygiene. Large bins with cover and lined with double plastic bags will be used for collection of used disposable Personal Protective Equipment except gumboots which will be kept in a separate container with disinfectant.

## **Nursing Station in Isolation Bays**

The nursing station will have an intercom facility for communicating with the central nursing station in the ward. It will also have an alcohol hand rub dispenser and a small cupboard with a mini fridge for keeping medications.

## **The Central Nursing Station**

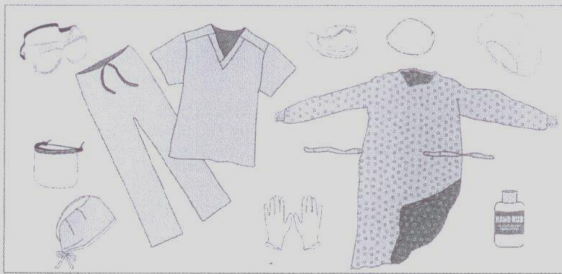
It will have a direct phone line and intercom communications with the nursing stations in all the bays. It will also be provided with alcohol hand rub dispensers and stationery for record keeping.

## **Procedures**

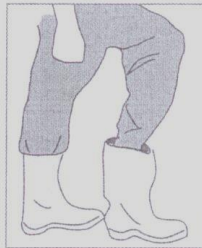
All staff working in the isolation bays will change into theatre clothes first (trousers and shirts) and then put on the personal protective equipment as per protocol in the changing room.

## Steps to put on Personal Protective Equipment (PPE)

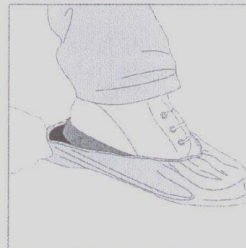
- 1 Always put on essential required PPE when handling either a suspect, probable or confirmed case of VHF. Gather all the necessary items of the PPE beforehand.
- 2 The dressing and undressing of PPE should be supervised by another trained member of the team. These instructions should be displayed on the wall in the dressing and undressing room. Steps to put on essential required PPE.
- 3 Put on the scrub suit in the changing room.



- 4 Put on gum boots; If not available, make sure you have closed, puncture and fluid resistant shoes and put on overshoes.



OR,  
IF BOOTS  
UNAVAILABLE



- 5 Place the gown over the scrubs.



- 6 Put on face protection:

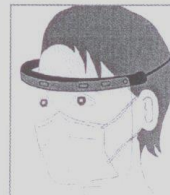
- 6a Put on a medical mask.



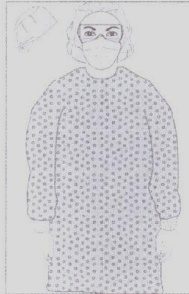
- 6b Put on goggles or a face shield



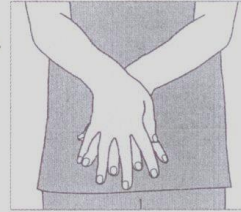
OR



7 If you have any abrasions on your scalp or you have concern for splashing fluids, also place a head cover at this time.



8 Perform hand hygiene.



9 Put on gloves\* (over cuff).



10 If a impermeable gown is not available and you expect to undertake any strenuous activity (e.g. carrying a patient) or tasks in which contact with blood and body fluids, place waterproof apron over gown.



#### Whilst wearing PPE:

- Avoid touching or adjusting PPE
- Remove gloves if they become torn or damaged
- Change gloves between patients
- Perform hand hygiene before donning new gloves

\* Use **double gloves** if any strenuous activity (e.g. carrying a patient or handling a dead body) or tasks in which contact with blood and body fluids are anticipated. Use **heavy duty/rubber gloves** for environmental cleaning and waste management.

## Steps to remove PPE

1 Peel off plastic apron and dispose of safely, (if the apron is to be reused, place in a container with disinfectant)



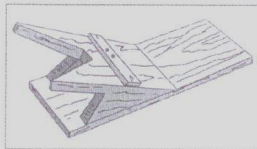
2 If wearing protective overshoes, please remove them with your gloves still on. (If wearing gum boots, see step 4).



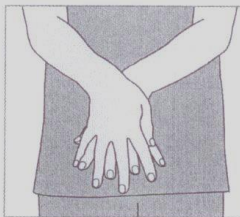
3 Remove gown and gloves and roll inside-out and dispose of safely.



4 If wearing rubber boots, remove them (ideally using the boot remover) without touching them with your hands. Place the removed boots into a container with disinfectant.



5 Perform hand hygiene.



6 If wearing a head covering, remove it now (from behind head).



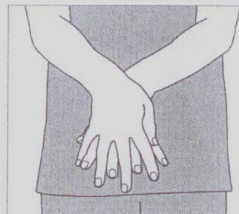
7 Remove face protection:  
7a Remove face shield or goggles (from behind head). Place eye protection in a separate container for reprocessing. OR



7b Remove mask from behind head.



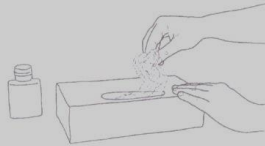
8 Perform hand hygiene.



## Technique for donning and removing non-sterile examination gloves

When the hand hygiene indication occurs before a contact requiring glove use, perform hand hygiene by rubbing with an alcohol-based handrub or by washing with soap and water.

### I. HOW TO DON GLOVES:



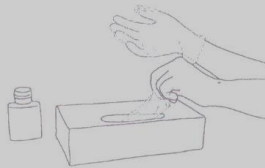
1. Take out a glove from its original box



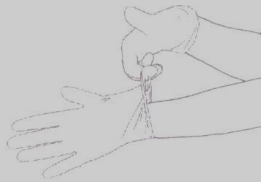
2. Touch only a restricted surface of the glove corresponding to the wrist (at the top edge of the cuff)



3. Don the first glove



4. Take the second glove with the bare hand and touch only a restricted surface of glove corresponding to the wrist

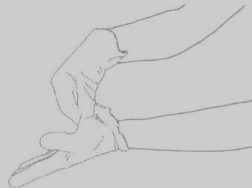


5. To avoid touching the skin of the forearm with the gloved hand, turn the external surface of the glove to be donned on the folded fingers of the gloved hand, thus permitting to glove the second hand

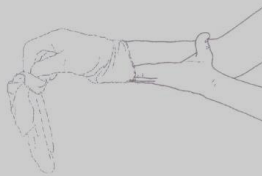


6. Once gloved, hands should not touch anything else that is not defined by indications and conditions for glove use

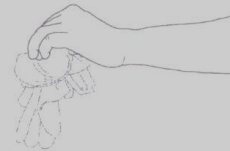
### II. HOW TO REMOVE GLOVES:



1. Pinch one glove at the wrist level to remove it, without touching the skin of the forearm, and peel away from the hand, thus allowing the glove to turn inside out



2. Hold the removed glove in the gloved hand and slide the fingers of the ungloved hand inside between the glove and the wrist. Remove the second glove by rolling it down the hand and fold into the first glove



3. Discard the removed gloves

4. Then, perform hand hygiene by rubbing with an alcohol-based handrub or by washing with soap and water

**STOCKPILING OF PERSONAL PROTECTIVE EQUIPMENT**

Item No	Items	Quantity for disposable items per month	Quantity for re-usables
1	<b>Disposable Surgical Gloves</b>		
	Small		
	Medium		
	Large		
2	<b>Disposable Surgical Gowns</b>		
	Medium		
	Large		
	Extra large		
3	<b>N95 Face Masks</b>		
4	<b>Surgical Face Masks</b>		
5	<b>Head Covers</b>		
6	<b>Shoe Covers</b>		
7	<b>Disposable Plastic Aprons</b>		
8	<b>Face Shields</b>		
9	<b>Goggles(USAID)</b>		
10	<b>Gum Boots (pairs)</b>		
	Size 42		
	Size 43		
	Size 44		

Item No	Items	Quantity for disposable items per month	Quantity for re-usables
11	<b>Long Sleeved Surgical Gloves</b>		
	Small		
	Medium		
	Large		
12	<b>Heavy Duty Gynecological Gloves</b>		
13	<b>Overalls</b>		
	Medium		
	Large		
	Extra Large		
14	<b>Coveralls</b>		
	Medium		
	Large		
	Extra Large		
15	<b>Heavy Duty Plastic Aprons</b>		
16	<b>Biohazard Plastic Bags</b>		
17	<b>Body Bags</b>		
18	<b>Thermal Thermometer</b>		
19	<b>Camera</b>		



**Standard precautions**

**1. Hand hygiene**

How to perform hand hygiene

- Clean your hands by rubbing them with an alcohol base formulation, as the preferred mean for routine.
- Hygienic hand antiseptics if hands are not visibly soiled. It is faster, more effective, and better tolerated by your hands than washing with soap and water.
- Wash your hands with soap and water when hands are visibly dirty or visibly soiled with blood or other body fluids or after using the toilet.

**Summary technique**

- Hand washing (40–60 sec): wet hands and apply soap; rub all surfaces; rinse hands and dry thoroughly with a single use towel; use towel to turn off faucet.
- Hand rubbing (20–30 sec): apply enough product to cover all areas of the hands; rub all surfaces until dry.

**Summary indications**

- Before touching a patient: Clean your hands before touching a patient when approaching him/her.
- Before clean / aseptic procedure: Clean your hands immediately before accessing a critical site with infectious risk for the patient (e.g. a mucous membrane, non-intact skin, an invasive medical device).
- After body fluid exposure risk: Clean your hands as soon as the task involving an exposure risk to body fluids has ended (and after glove removal).
- After touching a patient: Clean your hands when leaving the patient's side after having touched the patient.
- After touching patient surroundings: Clean your hands after touching any object or furniture when leaving the patient surroundings, without having touched the patient

**2. Gloves**

- Wear GLOVES when touching blood, body fluids, secretions, excretions, mucous membranes, no intact skin.

- Change GLOVES between tasks and procedures on the same patient after contact with potentially infectious material.
- Remove THEM after use, before touching non-contaminated items and surfaces, and before going to another patient. Perform hand hygiene immediately after removal.

### 3. Facial protection (eyes, nose, and mouth)

#### **Wear:**

- a surgical or procedure mask and eye protection (eye visor, goggles) or
- a face shield to protect mucous membranes of the eyes, nose, and mouth during activities that are likely to generate splashes or sprays of blood, body fluids, secretions, and excretions.

### 4. Gown

- Wear a gown to protect skin and prevent soiling of clothing during activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions.
- Remove soiled gown as soon as possible, and perform hand hygiene.

### 5. Prevention of needle stick and injuries from other sharp instruments

Be Cautious when handling needles, scalpels, and other sharp instruments or device

### 6. Respiratory hygiene and cough etiquette

Persons with respiratory symptoms should apply source control measures:

- Cover their nose and mouth when coughing/sneezing with tissue or mask, dispose of used tissues and masks, and perform hand hygiene after contact with respiratory secretions.

### 7. Environmental cleaning

- Use adequate procedures for the routine cleaning and disinfection of environmental and other frequently touched surfaces.

## **8. Linens**

Handle, transport, and process used linen in a manner which:

- Prevents skin and mucous membrane exposures and contamination of clothing.
- Avoids transfer of pathogens to other patients and or the environment.

## **9. Waste disposal**

- Ensure safe waste management.
- Treat waste contaminated with blood, body fluids secretions and excretions as clinical waste, in accordance with local regulations.
- Human tissues and laboratory waste that is directly associated with specimen processing should also be treated as clinical waste.
- Discard single use items properly.

## **10. Patient care equipment**

- Handle equipment soiled with blood, body fluids, secretions, and excretions in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and transfer of pathogens to other patients or the environment.
- Clean, disinfect, and reprocess reusable equipment appropriately before use with another patient.
- Clean used instruments.
- Dispose of used needles and other sharp instruments.

### Hand Hygiene

Carefully apply the following precautions to avoid any possible unprotected direct contact with blood and body fluids when providing care to the patient:

➤ ***Perform hand hygiene:***

- before donning gloves and wearing PPE on entry to the isolation room/area,
- before any clean/aseptic procedures being performed on a patient,
- after any exposure risk or actual exposure with the patient's blood and body fluids,
- After touching (even potentially) contaminated surfaces/items/equipment in the patient's surroundings and after removal of PPE, upon leaving the care area.

Hand hygiene should be performed within the isolation rooms/areas every time it is needed according to the above indications during care to the patient, along with change of gloves. When caring for patients in the same room, it is essential to organize the complete care to each patient before moving to the next and to perform hand hygiene between touching the patients.

**Neglecting to perform hand hygiene after removing PPE will reduce or negate any benefits of the protective equipment.**

# How to Handrub?

RUB HANDS FOR HAND HYGIENE! WASH HANDS WHEN VISIBLY SOILED

 Duration of the entire procedure: 20-30 seconds

1a



Apply a palmful of the product in a cupped hand, covering all surfaces;

1b

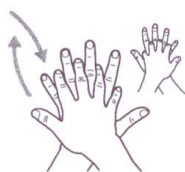


2



Rub hands palm to palm;

3



Right palm over left dorsum with interlaced fingers and vice versa;

4



Palm to palm with fingers interlaced;

5



Backs of fingers to opposing palms with fingers interlocked;

6



Rotational rubbing of left thumb clasped in right palm and vice versa;

7



Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8



Once dry, your hands are safe.

# How to Handwash?

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

 Duration of the entire procedure: 40-60 seconds



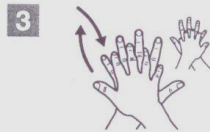
Wet hands with water;



Apply enough soap to cover all hand surfaces;



Rub hands palm to palm;



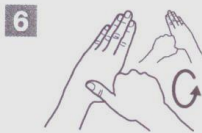
Right palm over left dorsum with interlaced fingers and vice versa;



Palm to palm with fingers interlaced;



Backs of fingers to opposing palms with fingers interlocked;



Rotational rubbing of left thumb clasped in right palm and vice versa;



Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;



Rinse hands with water;



Dry hands thoroughly with a single use towel;



Use towel to turn off faucet;



Your hands are now safe.

### **Collection of specimens in suspected case**

Follow safety guidelines when collecting specimens: wear gowns, gloves and masks, and wash hands after collection of specimens.

#### **Lymph node/bubo aspirate**

Place in a sterile container such as sterile plastic bijou bottle (normally used for CSF specimens) or sterile 25 mL universal container without salt (container which is sometimes used for urine culture).

Early buboes are rarely fluctuant or necrotic and thus, 1-2mL saline may need to be injected in bubo and aspirated.

#### **Blood cultures**

Inoculate blood in 2 blood culture bottles and observe aseptic technique as per usual practice to minimise contamination with skin flora.

#### **Sputum**

Collect in sputum pot.

#### **Bronchial washings**

Collect in sterile 25 mL universal container without salt (container which is sometimes used for urine culture).

- Samples may be collected by nursing staff as per usual practice, except for lymph node/bubo aspirate which should be obtained by a doctor

Make sure all containers/bottles are tightly closed and not leaking.

#### **Label and date specimen containers**

Place containers/tubes in a rigid container and an outer cardboard box (triple packing) for transport. Do not wrap specimens around forms. Inform bacteriology lab prior to sending specimens in suspected plague cases. Rigid containers and outer cardboard boxes will be provided by CHL as necessary.

**Treatment of Plague**

In addition to symptomatic and supportive therapy, antibiotic treatment is required.

The duration of antibiotic treatment is for ten days /or until two days after the fever has subsided.

<b>Groups</b>	<b>Antibiotic in order of preference</b>	<b>Dose</b>	<b>Route of Administration</b>	<b>Duration</b>
<b>Adults</b>	Streptomycin	1 gram twice daily	IM	10 days
	Gentamycin	5mg/Kg once daily or 2mg/Kg loading dose followed by 1.7 mg/Kg every 8 hours	IM or IV	10 days
	Doxycycline	100 mg twice daily or 200 mg once daily	IV	10 days
	Ciprofloxacin	400 mg twice daily	IV	10 days
	Chloramphenicol	25 mg/ Kg every 6 hours	IV	10 days
<b>Children</b>	Streptomycin	15mg/Kg once daily	IM	10 days
	Gentamycin	2.5 mg/Kg every 8 hours	IM or IV	10 days
	Doxycycline( 8 years and above)	Weight less than 45 Kg : 2.2 mg/Kg twice daily  Weight more than 45 Kg: 100 mg twice daily or 200 mg once daily		
	Ciproflaxacin	15 mg/ Kg twice daily	IV	10 days
	Chloramphenicol( for children above 2 years)	25 mg/Kg every 6 hours	IV	10 days



<b><i>Pregnant women</i></b>	Gentamycin	5mg/Kg once daily or 2mg/Kg loading dose followed by 1.7 mg/Kg every 8 hours	IM or IV	10 days
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### Disposal of the bodies

1. Post-mortem examination should be discouraged in suspected plague deaths.
2. The dead body should be packed in an impervious body bag for transport from the place of death.
3. The body should not be extracted from the bag and should not be bathed before cremation/ burial.
4. Cremation or burial of the dead body should be undertaken according to local customs
5. Funeral ceremonies in the houses of plague victims may involve assembly of people and should be discouraged.
6. The dead bodies of plague victims should not be handled and encoffined by the relatives or friends of the deceased.
7. This should be done by professional undertakers well versed with safety procedures.
8. The undertakers should use masks, protective clothing, boots and thick rubber gloves.
9. Professionals handling the dead bodies should receive chemoprophylaxis in recommended dosages as per the advice of the doctor.
10. A layer of lime as an absorbent material must be kept in the coffins before the dead bodies are placed in them.

## **Guidelines for Rodent Control through Integrated Pest Control Management**

These guidelines have been prepared at the Ministry of Health & Wellness, and will be disseminated to all stakeholder Ministries in order to provide them with a standard and consistent approach to implement the National Anti-rodent campaign.

The aim of these guidelines is the elimination of rodents through a holistic approach using Integrated Pest Control Management.

This document describes the basic principles of rodent control, followed by directions for integrated rodent control in specific settings such as Government institutions, parastatal bodies, private households, private commercial buildings, food establishments, market, fairs, etc.

### **A. BASIC GUIDELINES.**

The three main pillars of the integrated rodent control strategy are:

1. Elimination of Food Sources
2. Elimination of Harbourages
3. Utilisation of Rodenticides

#### **1. Elimination of Food Sources**

- Spillage of food to be avoided
- All food remnants, including uneaten pet food, to be removed immediately and properly stored in suitable rat proof containers
- All such wastes to be collected, carted away and disposed of regularly, preferably on a daily basis.
- All fallen fruits to be properly collected and disposed of.
- Garbage should be stored in tightly closed bins, which are preferably elevated at least 30 cm off the ground, collected, and regularly disposed of.
- Food stored in cupboard, store rooms, cabinets should be kept in such a way as to avoid access to rats.

## 2. **Elimination of Harbourage**

- Regular cleaning of wastelands, water drains, rivers, canals and other water courses to be carried out.
- Regular cutting of grass, and pruning of dense shrubbery and creepers to clear an area within 30 m of the dwelling place.
- Bulky wastes and unnecessary materials stored indoors, such as boxes, paper, clothes, etc. to be removed at regular intervals and disposed of properly.
- Undue stacking and piling of timber, metal scraps, demolition debris, etc in compounds to be avoided.
- Good hygienic and housekeeping practices in animal rearing to be observed.
- Proper landscaping and elimination of burrows to be done in order to avoid harbourages
- All buildings which are in dilapidated and ruinous conditions to be pulled down or cleaned regularly.

## 3. **(A) Baiting and use of Rodenticide and Trap**

- Use approved baits only, for effective control
- Apply as per mode of instructions
- Adhere to established procedures as per guidelines as follows:-

1<sup>st</sup> week: Environmental sanitation procedures

2<sup>nd</sup> week: Environmental sanitation procedure + Prebaiting

Procedures (attracting rodents by placing of foodstuffs without poisons at identified sites)

3<sup>rd</sup> week: Environmental sanitation procedures + starvation procedures (i.e. Depriving of foods and baits)

4<sup>th</sup> week: Environmental sanitation procedure + baiting procedures (i.e. placing of baits, with rodenticide at specific identified points)

### **(B) Use of Traps**

- Use wooden traps and assorted traps (Spring trap)
- Visit the traps at least once every 24 hours to remove any dead rodents and to reset the traps.
- Dispose of all dead rats by burial

There are several advantages for using traps:

- Traps are safer than potential hazardous poison baits
- They give quick, immediate results
- Location and disposal of dead rodents is easier, avoiding odor problems that will occur if poisonous baits are used to kill rodents in inaccessible areas.

### **(C) Use of Glue Boards**

If glueboards are used, they should be placed in such a way that they do not pose a hazard to non target species, and should be inspected at least twice a day.

**NB:** - Procedures as in the fourth week should be continued until there are no signs of rats.

- It is advisable to use different kinds of rodenticides, one kind at a time.
- It is advisable to mix one part of chicken skin paste with 10 parts of baits. The final product becomes highly attractive to rats
- Rats often travel along walls, boxes, or sacks, but avoid open spaces. They travel along a definite route, leaving well defined runways. So, it is in these places that baits shall be placed.
- It is advisable to use gloves and never touch poisons and food base with bare hands, because rats develop bait shyness easily.
- Always buy poisons which are well labelled. Follow instructions, and store according to the product label.
- Baits should be used in areas where domestic animals and children can't reach.

- All baits that remain unconsumed overnight should be discarded and fresh quantities replenished. Rats are choosy, won't consume putrid or mouldy food.
- If a location is to be baited, the site should not be cleaned immediately before baiting, because this disturbs the rodent population, making bait acceptance more difficult to achieve.
- Every householder/manager shall endeavour to possess a wooden trap and assorted traps (spring type)
- All dead rats shall be collected in proper receptacles and disposed of appropriately.

#### **B. Protocol for Integrated Rodent Management in Government Institutions and Parastatal Bodies.**

Rodent Control in structures requires the following:

- **A basic knowledge of rodent biology.**

A fundamental understanding of the habits and reproductive abilities of rodents is helpful for knowing where to look for signs of animals and how to select the best control measures.

- **A thorough inspection of the exterior and interior of a building.**

The main purpose of an inspection is to identify structural defects which allow rodents to enter buildings. Inspections also provide information on the kinds of rodents present, key shelter areas, locations where animals obtain food and water, and also helps to identify conditions around buildings which favour infestations. Those findings are used to set priorities for repairs needed to keep Rodents out of buildings and to recommend changes in conditions which support rodent populations.

- **Effective exclusion.**

Rodent control in structures is based on one simple rule: rodents must be prevented from entering a building or a room. Excluding rodent, by closing all possible holes where they can enter or leave a structure, is always the most important measure against infestation.

- **Good sanitation practices that eliminate food, water, shelter for rodents.**

Good sanitation removes resources needed by rodents and limits the number of animals that can live in an area. Good sanitation is very important for controlling rodent populations, but even the best of sanitation measures will not prevent infestations where exclusion is not adequate.

- **Continually removing 85 to 95 percent of the rodents present.**

Rodents mature quickly and produce large number of young. The numbers of rodents present will not decrease much or may continually increase unless most of the breeding adults are removed.

- **Regularly checking for new rodent activity.**

Regular re-inspection (monitoring) of sites is important to determine if previous control efforts were effective, to find any newly opened holes which rodent could use; to watch for changes in sanitation and harborage conditions, and to determine if the number of animals present are increasing, decreasing or remaining unchanged.

- **Cooperation**

Controlling rodents must always be a team work between building occupants (affected persons) maintenance workers (for repairs) and area managers (decision makers). It is important for all involved persons to be totally committed to and have a clear understanding of the program needs.

### **Additional Measures**

- ▶ Do not provide hiding places for rodents; store materials such as books, papers, files etc and boxes on a rack with a clean, open area underneath. Get rid of unused material.
- ▶ Discard needless old furniture, newspapers.

### **C. Protocol for Integrated Rodent Management in private households, private commercial buildings and food establishments.**

Rodent infestation can be determined by direct observation of animals or inferred from the presence of faeces in closets or cabinets or on the floors or from evidence that rodents have been gnawing at food.

If rodent infestation is detected inside the home or outbuildings, rodent abatement measures should be completed.

#### **Finding Rodent Harborage**

If evidence of an active rodent infestation is found in a room, it is very important to concentrate efforts on finding where the animals have entered. Beyond the initial inspection, this may require follow up inspections after placing out rodent traps, bait, stations or non-toxic tracking stations (wheat flour, talc or corn-starch sprinkled on the floor or on small boards around the room) to show those areas most used by rodents. Closing interior doors between rooms at night will limit rodent activity and will help to find points of entry.

#### **Finding Food and Water Available to Rodents**

Look for any sources of food or water available to rodents. These may be found in desks, kitchens and snack rooms, around pop and candy machines and coffee stations, indoor storage of empty aluminium cans destined for recycling, dead insects or rodents on sticky or snap traps, bars of soap in rest rooms, garbage left overnight in buildings, broken packages or spilled foods in storage cabinets, open drains or leaking pipes, etc.

Always be on the lookout for rodent feeding stations when conducting inspections. These are semi-hidden sites where rodents feel it safe to eat food they have collected from other locations.

Usually feeding stations are located in protected room corners; under or behind the bottom drawers of kitchen cupboards; under stoves, refrigerators, sinks, under or behind furniture. The stations are recognized by finding a greater than normal amount of rodent faeces and urine deposits in some spot or finding remnants on a variety of foods (candy wrappers, nut shells, etc) in a given location. The food remnants found in feeding stations can offer helpful clues for the need to inspect other locations for rodent activity. Determine if there are any sources of moisture available to rodents and other pests. Ask building occupants if they have known water leaks, be on the lookout for moist areas, swollen wood and cracked paint.



Using a flashlight to look for areas offering shelter to rodents. Such areas will be found inside cabinets, in and among boxes and other items stored on floors, under dressers and chests of drawers, behind and inside machinery (kitchen appliances, water coolers etc.) around hot water heaters and furnaces, and in lockers. Sometimes overlooked sources of rodent harborage and activity are found under the lower drawers in kitchen cupboards or stoves, in refrigerator drip pans, and coils, inside upholstered furniture and furniture having hollow legs, in attic and store room clutter, inside wall voids, and inside of electrical motor and computer cases.

### **1.1 Prevention and Control of Rodent Infestations**

Following are some specific measures, adapted to local circumstances, which are recommended to prevent rodents from entering the house:

- Use steel wool or cement to seal, screen or otherwise cover all openings into the home that have a diameter greater than or equal to ¼ inch.
- Then set rodent traps inside the house – use spring-loaded traps that kill rodents.
- Place metal roof flashing as a rodent barrier around the base of wooden, earthen or adobe dwellings up to a height of 12 inches and buried in the soil to a depth of 6 inches.
- Place 3 inches of gravel under the base of homes or under mobile homes to discourage rodents burrowing. Reduce rodent shelter and food sources within 100 feet of the home.
- Use raised cement foundations in new construction of sheds, barns, outbuildings, or woodpiles.
- When possible, place woodpiles 100 feet or more from the house, and elevate wood at least 12 inches off the ground.
- Store grains and animals feed in rodent-proof containers.
- Near buildings, remove food sources that might attract rodents, or store food and water in rodent proof containers.
- Stay hay on pallets and use traps or rodenticide continuously to keep hay free of rodents.
- Do not leave pet food in feeding dishes.
- Dispose of garbage and trash in rodent-proof containers that are elevated at least 12 inches off the ground.
- Haul away trash, abandoned vehicles, discarded tires and other items that may serve as rodent nesting sites.
- Cut grass, brush and dense shrubbery within 100 feet of the home.

- Place spring-loaded rodent traps at likely spots for rodent shelter within 100 feet around the home and use continuously.
- Store garbage in metal or heavy plastic containers with tight lids.
- Place trash outside shortly before pick up; don't leave plastic garbage bags overnight.
- Remove weeds and debris near buildings and in yards; don't give rats a place to hide.
- Store opened food in metal or glass containers with tight lids.
- Don't leave extra pet food out; store in a secure container;
- Sweep up food remains, litter and trash-inside and outside home;
- Inspect the basement and house for cracks and holes; seal them with mortar.
- Make sure you have screens on windows; inspect windows and screens for holes.
- Keep outside doors closed; use metal trim to prevent rodents from gnawing and entering underneath.
- Don't provide hiding places for rodents; store materials such as lumber and boxes on a rack with a clean, open area underneath. Get rid of unused material.

#### **D. Protocol for Integrated Rodent Management in markets and fairs.**

There are two very important reasons for controlling rodent populations in and around market and market fairs. Rodents can be responsible for spreading diseases and rodents can damage buildings and building contents.

By far, the most basic reason to control rodents is because of potential risks from human contact with rodents or rodent debris. Rodents are known to be able to carry over 200 disease organisms, many of which can be transmitted to man. Many of these diseases are spread while rodents wander about in market buildings and fairs at night searching for food and mates. During those activities, they continually drop faeces, urine and hairs which can come in contact with human foods, eating utensils, etc or can be responsible in other ways for the spread of diseases.

Many kinds of physical damage are expected when rodents enter or infest market buildings. The rodent often build nests and store large amounts of food (corns, nuts, seeds, etc) behind walls, or in attics and such storage can cause structural damage and attract other pests.

Rodent burrows near building foundations increase the risk of structural deterioration by loosening soils and allowing for increased water penetration.

The underlying causes of most rodent infestations in market buildings are structural defects (deficiencies such as holes, cracks, gaps, open drains, etc) which allow rodents to enter. These defects can be discovered by routinely inspecting the market building and market fairs.

Observations made over long periods of time (monitoring) provide additional information on the relative effectiveness of control efforts, changes in the number of rodents present or renewed rodent activity, locations of greatest rodent activity, changes in the amount of food or shelter available for rodents, changes in the rates of structural deterioration, and other helpful information.

These two terms, “inspections” and “monitoring”, commonly used by rodent control workers, are sometimes confusing because they describe what seem to be similar activities. The difference is:

- “Inspection” is a comprehensive initial evaluation where the Health Inspector looks for the presence of rodents and rodent signs, the conditions favouring them, and potential sources of rodent access into markets and fairs.
- “Monitoring” is a continuing activity that identifies and evaluates changing conditions over time including re-infestations and new sources of rodent access which have occurred since the last evaluation.

Information derived from inspections is very helpful to follow up control programmes. The Health Inspector should record all information received following inspection, including the following:-

- the kind, extent, and severity of the rodent infestation.
- Locations where rodents may be entering the building.
- Any possible supporting reasons for the infestation.
- The presence and location of major rodent activity and harbourage areas, and
- Recommendations for the safest and most appropriate rodent control strategies.

The first step in making an inspection of a market building, fairs, etc is to prepare a rough drawing of the building and its exterior, showing all the major features where rodents might

find entry. These may be access points for electrical and plumbing service lines, doors, windows, crawlspace, basement opening, window wells, decks, dormer corners, drains, etc.

From a point of beginning, slowly and systematically examine the entire market exterior from the ground to the roof while looking for defects that could allow for rodent entry. When defects are found, note their locations on the drawing and describe as possible rodent entry points. The aim of an exterior inspection is to obtain as much information as possible on any ways rodents might enter, and on any existing conditions in or near the market building which might support or attract rodent activity. Normally, deficiencies seen on building exteriors will give clues as to what will be found inside.

**General market building exterior:** carefully check the side walls, eaves, cornices, drains, loading and unloading platforms, all other external areas for cracks or holes. Foundations are particularly vulnerable to rodent attack. Look for cracks and holes in or under foundations, improperly fitting crawl space or basement doors, openings around window wells. Watch for signs of rodent activity next to the building as shown by fresh burrowing activity, burrows that lead under foundation, rodent runways along walls, plants damaged by rodents, rodent tracks and droppings, rodent feeding stations, gnawing damage on structures, harbourage for rodents (debris, tall vegetation, etc).

Doorways are one of the most common places through which rodents enter a building. The rodents are drawn to outside doors; check doors and screen doors for self closing strings, door sweeps, and screening made from metal that is not loose or damaged-carefully check around exterior door frames, thresholds and windows for cracks and gaps.

Gaps and holes around electrical, plumbing and gas line entering the market building are ideal entrance points for rodents. Check to see that there are no gaps or holes larger than  $\frac{1}{4}$  inch around where electrical lines and pipes pass through walls. Check to see if electrical breaker box doors fit tightly.

Odour from garbage disposal areas attracts rodents to the market. Examine garbage containers and surrounding areas for obvious rodent activity and poor sanitation (garbage on the ground, improperly washed concrete pads), garbage cans located too close to the market building and loose-fitting garbage can or dumpster lid. Rodents must be kept from feeding on garbage. Poor sanitation practices that support rodents should be noted in the inspection report and brought to the attention of the market management.

## **1.2 Prevention and Control of Rodent Infestations**

The next step in preventing and controlling rodent infestations is to exclude rodents by correcting defects in the market building.

Exclusion (or Rodent-proofing) is the most important, most effective and most permanent method to prevent and control rodent infestations. And, it is rather simple: eliminate (or minimise) all holes, cracks and gaps of  $1/4$  inch size or larger where rodents can enter or leave buildings where the rodents can reach food, water or shelter.

It is usually easy to be able to find a good number of those entry points in the market, especially in building with active rodent infestations. Common points of entry are those beneath exterior doorways around water, electrical, gas, vent and sewer line chases; through unscreened pipes, through broken screens, and through gaps in window and door facings, under/through building foundations.

It must always be remembered, however, that exclusion is never permanent. Continual and ongoing inspection, exclusion, sanitation, and monitoring are required to keep the market tight enough to prevent or control re-infestations and to deprive rodents of food and harbourage.

All holes and cracks should be covered with thin galvanised metal sheets or filled with cement.

Most of the many small gaps and holes around electrical lines, plumbing and drain pipes, conduit, gas lines and ducts which enter the market building can be sealed with metal sheet. Metal sheet can be used to make conical or flat, rodent-proof guards around wires to prevent rodents from climbing onto roofs.

Install metal kick plates, tight-fitting door sweeps, or metal thresholds on all exterior doors that allow no more than  $1/4$  inch clearance between the door and floor. Windows must properly close and have intact screening, preferably made from metal. Seal all cracks or gaps around window and door frames with caulking or repair the facings.

Repair cracks in floors, walls, and foundations with concrete.

To keep rodents from being able to use vegetation as a way onto roofs, trim all trees and shrubs away from buildings and remove limbs which overhang or come close to roofs.

Although it is clear that excluding rodents is the most important key in preventing infestations, good interior sanitation is always important in controlling rodents. Good sanitation practices have tremendous impacts in limiting the size or increase of rodent populations by limiting resources available to them.

Reduce and eliminate all possible food and water available to rodents. Store all foodstuffs (dry, vegetables, groceries) in glass, metal or durable plastic rodent-proof containers to prevent rodents to chew through. Keep indoor and outdoor garbage cans tightly covered, remove garbage from market everyday. Promptly remove all left-over food. Trash also should be stored in tightly sealed containers including trashcans and dumpsters with lids. Dumpsters should be placed as far away from the market as is practical, equipped with tight-fitting covers and have no holes larger than  $1/4$  inch. Dumpsters drain openings should be securely plugged. Dumpsters as well as the areas underneath and around them should be washed regularly and should always be kept clean. Trash removal should be daily to keep rodents from relying on dumpsters as a food source.

Water management is also important for rat control. Outdoors, water should not be allowed to puddle around the market or fair. Faulty grades should be filled to slope away from the market. Gutters and downspouts should be kept free from debris. Repair leaky pipes.

The market building should be washed daily in the evening after all activities.

Be sure rodents are not imported into the building from the outside. Rodents are sometimes brought in with vegetables, grocery sacks, boxes and other items.

Remove as much grass, weeds, debris, odds and ends from around the building. These provide food sources and harbourage sites for rodents. If possible maintain a vegetation-free zone around the building. Continually clean up all outside and inside clutter/litter. Trim the bottoms of hedges and other ground-hugging plants up from the ground to eliminate rodent harbourage.

Sanitation and exclusion work together to enhance the effectiveness of trapping and baiting: all are components of an integrated rodent management program. Removing food sources and restricting rodent access forces rodents to roam further away from

their harbourage in search of food, making their contact with rodent traps and baits more likely.

The use of rodent traps and/or baits depends on the situation. As with any Integrated Rodent Management program, the best methods are selected after careful inspection, pest identification and assessment of the situation. While baiting is often the best way to quickly control sizeable rodent infestations, in many situations trapping has advantages over baiting. Trapping does not use rodenticides. Trapped rodents can be discarded so no odour problem results. And trap catches may be a more accurate means of assessing the size and characteristics of a rodent population.

Baiting rodents with rodenticides is another effective means of control. Often, baiting is the most efficient and timely way to eliminate large numbers of rodents. The main disadvantage is that rodenticides are toxicants and must be used carefully to avoid harming people, pets and other non-target animals. As with all pesticides, precautions (and associated risks) must be taken when using rodenticides.

Continually monitoring for rodents is the last important step in managing rodent infestations. Before beginning a monitoring programme, use diagrams of exterior and interior floor plans to identify locations where traps will be placed. Assign specific persons to do monitoring and establish a fixed schedule for those activities.

Keep records on the appearance of rodent signs around the outside of structures and any developing structural deficiencies which could allow rodents to enter the market.

Watch for and record the presence and locations of any rodent sign (faeces, food damage, feeding stations, gnawing damage, rodent holes, etc) and ask market officer if they have seen rodents or evidence of rodent activity.

Over a period of time, the written monitoring record will provide very helpful information on the actual presence of rodents, on relative increases and decreases in the number of rodents present and clearly point out those areas in the market where rodent activity is heaviest.

Monitoring records will also show the effectiveness of treatments. The information can be used to show the needs for developing more effective management strategies or control methods.

Controlling rodents in markets, and market fairs, is very important from the standpoints of both human health and possible structural damage. Rodent control can be an attainable goal but it always demands more than randomly setting out a few traps. Uppermost, rodents must be prevented from entering the market or any other building (food establishment). These demand cooperative efforts between all involved persons (maintenance persons, building occupants, managers, market officers). In frequently inspecting buildings and surroundings, and promptly closing small, seemingly unimportant holes. And, it also requires good sanitation practices and implementing effective trapping and monitoring programs. None of these measures are complicated or excessively difficult; however, rodent control is usually unsuccessful when these critical steps are not fully undertaken.



### Post Exposure Prophylaxis for Contacts

Post exposure prophylaxis is recommended for persons with known exposure to Plague such as a close contact of a pneumonic Plague patient or direct contact with infected body fluids and tissues. The duration of post exposure prophylaxis is for seven days.

<b>Groups</b>	<b>Antibiotic in order of preference</b>	<b>Dose</b>	<b>Route of Administration</b>	<b>Duration</b>
<b>Adults</b>	Doxycycline	100 mg twice daily	Orally	7 days
	Ciprofloxacin	500 mg twice daily	Orally	7 days
<b>Children</b>	Doxycycline( for children of 8 years or above)	Weight less than 45 Kg : 2.2 mg/Kg twice daily  Weight more than 45 Kg: 100 mg twice daily	Orally	7 days
	Ciproflaxacin	20 mg/ Kg twice daily	Orally	7 days
<b>Pregnant women</b>	Doxycycline	100 mg twice daily	Orally	7 days
	Ciprofloxacin	500 mg twice daily	Orally	7 days



**MINISTRY OF HEALTH AND WELLNESS**

**CERTIFICATE OF NOTIFICATION**

(To be forwarded to the nearest Health office)

I hereby certify and declare that in my opinion

Mr/Mrs/Miss.....aged.....

residing at .....

is suffering from.....

Duly Qualified Medical Practitioner

Name: .....

Address: .....

Signature: ..... Date: .....

N.B Blank copies of this form are obtainable free from Health offices from the Ministry of Health and Wellness, 5<sup>th</sup> Floor, E. Anquetil Building, Port Louis or downloadable from the Ministry's website

**INFECTIOUS OR COMMUNICABLE DISEASES**

By virtue of the public Health (Infectious of Communicable Diseases) Regulations 1987, the following diseases are declared to be infectious or communicable:

- |  |   |
|--|---|
| 1. Acquired Immuno Deficiency (AIDS) related complex ARC with positiveserology | 18. Malaria   |
| 2. Acquired Immuno Deficiency Syndrome (AIDS)                                  | 19. Measles   |
| 3. Amoebiasis  | 20. Meningitis (cerebrospinal)                                    |
| 4. Anthrax (Human)   | 21. Plague  |
| 5. Brucellosis   | 22. Poliomyelitis, acute  |
| 6. Chikungunya   | 23. Puerperal Pyrexia   |
| 7. Cholera   | 24. Rabies (Human)  |
| 8. Dengue Fever  | 25. Relapsing fever   |
| 9. Diphtheria  | 26. Schistosomiasis (BilharSIASIS)                                |
| 10. Food Poisoning (bacterial, other)  | 27. Soft Chancre  |
| 11. Gonorrhoea   | 28. Syphilis  |
| 12. Haemorrhagic Fever   | 29. Tetanus (neonatorum & adult)                                  |
| 13. Human Immuno Deficiency (HIV) Infection                                    | 30. Tuberculosis (respiratory , skeletal, central nervous system) |
| 14. Infective Hepatitis  | 31. Typhoid fever (with paratyphoid)                              |
| 15. Influenza like diseases  | 32. Typhus  |
| 16. Leprosy  | 33. Whooping cough (Pertussis)                                    |
| 17. Leptospirosis  |   |

These diseases should be notified to the nearest Health Office or to the Communicable Disease Control Unit at Headquarter on fax: 201 3185, e-mail [epid.ai.resp-moh@govmu.org](mailto:epid.ai.resp-moh@govmu.org).

Blank copies of the certificate of notification are obtainable from Head Office of the Records section of all Hospitals.