

***OPERATIONAL PLAN OF THE  
MINISTRY OF HEALTH AND  
WELLNESS ON MERS-CORONAVIRUS:  
A STEP-BY-STEP APPROACH***

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**Revised on 1<sup>st</sup> September 2021**

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## Executive Summary

A novel avian influenza virus, strain A MERS-CORONAVIRUS has been reported in Middle-East.

The Government of Mauritius has formulated a pandemic preparedness plan, specifically tailored to MERS-CORONAVIRUS avian influenza virus in order to maximize containment of the virus, minimize its impact and ensure continuity of health care and other essential services during the pandemic. The plan is jointly finalized by a task force of the Ministry of health in coordination with other relevant sectors including the Ministry of Agriculture, Mauritius Airport Authority, Mauritius Port Authority, Ministry of Education, Department of Police and the World Health Organization and other stakeholders. The Ministry of health is responsible for the implementation of the health aspects of the plan

The plan serves as a blueprint for actions and formulation of standard operating procedures (SOP) by all stake-holders. The plan consists of five strategic directions: (1) planning and coordination, (2) situation monitoring and assessment, (3) prevention and containment, (4) health service response, and (5) communications. When properly executed, the actions will ensure surveillance to detect the first entry of pandemic to our ports and seaports and community at large; separation of infected persons; tracing of contacts and interruption of the virus transmission by pharmacological and basic hygiene measures will ensure the pandemic is contained at the beginning stage, or in the worst scenario mitigate the impacts. It presents a collection of protocols to be used under all phases of the pandemics for commonly encountered pandemic scenarios by all stakeholder involved in controlling pandemic.

The plan is a dynamic document and the integrity of the plan will be validated by conducting table top exercises in which the stake holders and responsible officers rehearse their respective parts of the plan by solving different scenarios of pandemic influenza. Any missing gaps in the planning process or protocol will be subsequently incorporated in the plan.

While a large component of the plan has already been implemented, support to ensure minimum disruption of the pandemic influenza pandemic on the Mauritian population, additional resources will be required for infrastructure of hospital and laboratory, manpower, supplies and equipment and logistic support.

## 1 INTRODUCTION

Under the new International Health Regulation (IHR 2005) Member States are required to report any novel virus to World Health Organization as a Public Health Emergency of International Concern (PHEIC). There is no accurate way to predict the arrival of a pandemic strain of influenza besides active surveillance. Invariably all human pandemic influenza to date has had a genetic component that is avian or swine. For this reason, intensive surveillance is carried by the Global Influenza Surveillance Network of WHO and its collaborators. Presently, there is novel influenza virus infection caused by an avian strain of MERS-CORONAVIRUS and in future there may be other strains. Therefore, a MERS-CORONAVIRUS pandemic influenza preparedness plan has been prepared.

So far no human cases of novel MERS-CORONAVIRUS influenza virus has been noted in the African continent and in Mauritius. However, with increased travel link to China and Asia the eventual arrival of this virus might be possible in Mauritius. This virus has not yet acquired the potential to cause a full pandemic worldwide and increase in virulence leading to higher death rates than seen presently. One way to mitigate the negative consequences of the pandemic influenza pandemic is to take timely public health measures that have been defined in pandemic preparedness plan. WHO has requested Member States to activate their Pandemic Preparedness Plan (PPP). This document outlines the PPP of the Government of Mauritius, consisting of five major strategic directions. Its serves as a blueprint for actions and formulation of standard operating procedures (SOP) by all stake-holders.

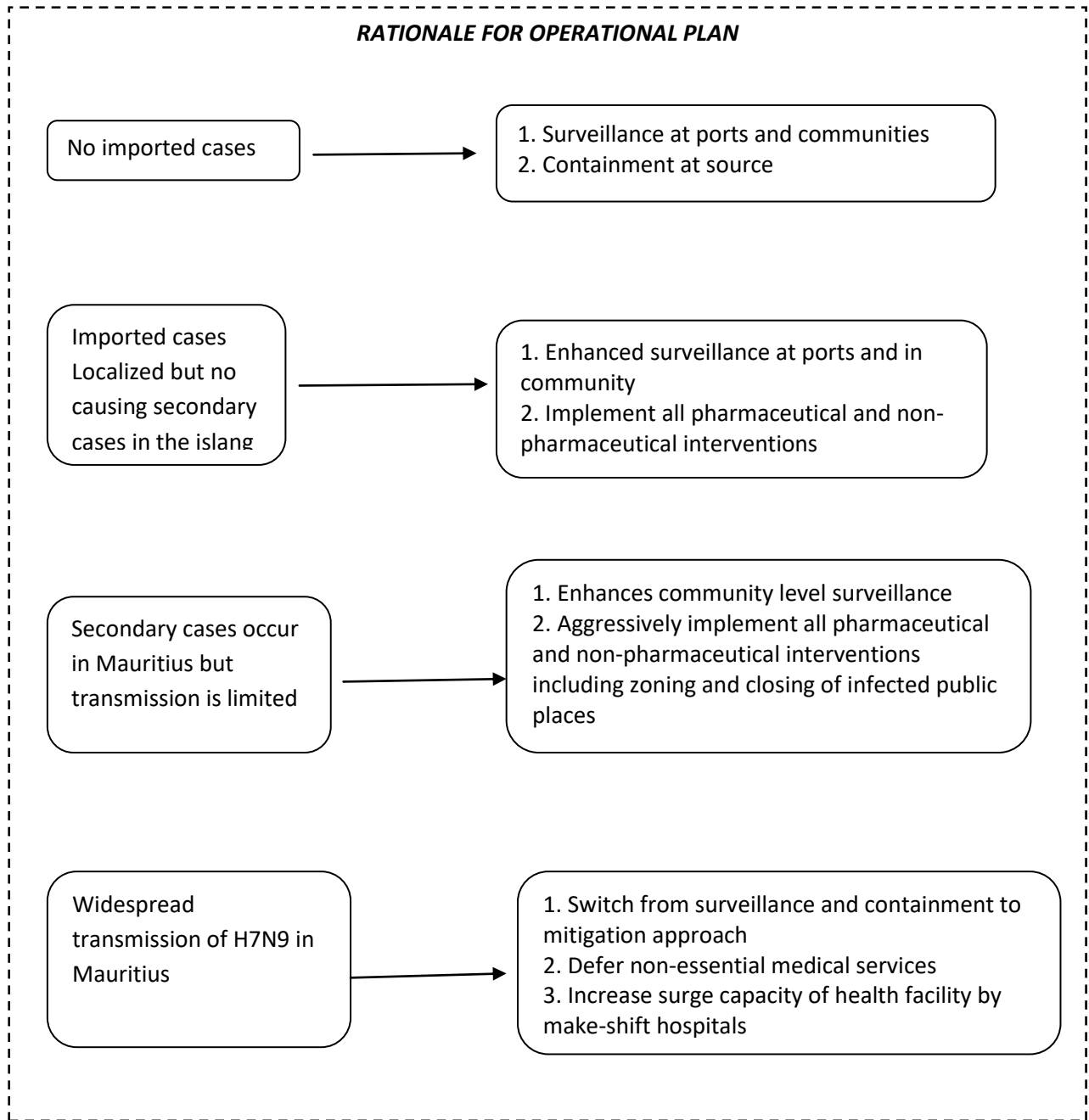
These strategic directions as associated with relevant specific activities are described in this plan. A pandemic is preceded by a pre-pandemic alert phase and when a pandemic comes it usually does not affect all countries at the same time. These epidemiological features of influenza offer windows of opportunity for instituting mitigation measures and the pandemic preparedness plan of the Government of Mauritius has been tailored to this end.

### **1.1 How to use this operational plan**

To facilitate and monitor implementation of the plan, the necessary actions for each of four different scenarios are given namely:

1. When there is no imported or indigenous cases
2. When imported index cases are localized in the island
3. When secondary cases are localized in the island
4. When there is widespread cases in the island

The necessary actions and associated standard operating procedures (SOP) or guidelines are given in table 1. The responsible party has simply to consult the relevant sections and the SOPs that have been numbered for ease of reference.





**Table 1: summary of Actions to be implemented during either global pandemic alert or pandemic period for MERS-CORONAVIRUS**

No imported or indigenous cases in island		<i>Only imported cases localized in island</i>		Secondary cases localized in island		<i>Widespread cases island wise</i>	
<b>COORDINATION</b>							
<b>Action</b>	protocol	Actions	protocols	action	protocol	Action	protocols
<b>Constitute pandemic committee</b>	1. command center at MOH 2. intersectoral committee 3. Communication	Activate pandemic committee Create intersectoral crisis management committee	Intersectoral protocol for	Implement crisis management committee	Design crisis protocol	Maintain crisis management committee	Crisis protocol
<b>MONITORING</b>							
<b>Actions</b>	protocols	Actions	protocols	Actions	protocols	actions	protocols
<b>Monitor all ports of entry</b>	All protocols in algorithms 1 and 2	Implement Enhanced surveillance at points of entry	1. All protocols in algorithms 1 and 2	1. Implement Enhanced surveillance at points of entry 2. implement Contact tracing	1. All protocols in algorithms 1 and 2 and 5-6	Monitor disease trend	Surveillance SOP to be developed
<b>CONTAINMENT</b>							
<b>Actions</b>	protocols	Actions	protocols	actions	protocols	Actions	protocols
<b>Review patient management protocols</b>	All protocols in algorithms 1 and 2	1. Isolate and treat patient 2. implement social distancing at community level 3. Distribute health message	1. All protocols in algorithms 1 and 2 2. Containment protocols 1-6	1. Isolate and treat cases 2. Consider zoning for closing schools and public gathering	Infection control protocol number Use of antiviral protocol number Zoning protocol number Social distancing protocol number	1. Manage sick patients 2. Implement Triage of patients	Algorithm4 and containment protocols 1-6
<b>HEALTH SECTOR READINESS</b>							
<b>Stock pile medicine and supply</b>	Containment SOP4	Procure medicine and supply for 2-3 months	Protocols of Annex5	Prepares surge capacity of health sector	Containment protocols 4-6	Mitigate epidemic	All containment SOPs
<b>Develop protocols</b>	Table top protocol number Simulation protocol number						
<b>Build manpower</b>	Develop roster	Compile retiree/volunteers	Try staff or roster	Use during simulation	Deploy backup	Protect staff and deploy back up	Containment SOPs 1-7

## 2 ACTIONS TO BE TAKEN WHEN THERE IS NO IMPORTED OR INDIGENOUS MERS-CORONAVIRUS IN MAURITIUS

### 2.1 Coordination

#### *Rationale*

To define the role, function and responsibilities of each stake holder, achieve harmonization and minimize duplication, redundancy or contradictory activities.

#### **2.1.1 Action 1: Constitute an intersectoral committee headed the Ministry of Health and Wellness**

The intersectoral committee on pandemic implementation will be headed by the Honourable Minister of Health and Wellness. The members from the Ministry of Health and their contact details are given in Appendix 1.

The members of the non-health sectors and their contact details are given in Appendix 2.

#### **2.1.2 Action 2: Establish communication strategy within the committee**

The SOP for communication shall be as follows:

- The minister shall be at the central command level and issue any directives
- Any other directive will be issued by management meeting, after consultation with the minister
- Communication with the media shall be channeled via press attaché
- Information pertaining to importation of cases, outbreaks etc will be channeled from the site of occurrence to the appropriate directors by phone and fax
- The directors will inform the minister right away and also other directors
- The directors will delegate actions to be taken to the relevant officers.

#### **2.1.3 Action 3: Constitute a crisis management committee**

Another task of the pandemic committee is to constitute a crisis management committee to reviewing the situation during a pandemic and issuing interim or revised guidelines and SOPs.. The decision making body rests with the Ministry of Health and Wellness and the Head of command is the Hon. Minister of Health& Wellness. Other members include:

- Senior Chief Executive, Ministry of Health& W
- Senior Chief Executive, Prime Minister's Office
- Director General Health Services
- Representative from non-health sectors
- Other representative as deemed necessary according to the gravity of the situation.

## **2.2 Surveillance for the virus in Mauritius**

*Rationale: to detect the first entry of the MERS-CORONAVIRUS virus in Mauritius*

Surveillance for the virus among crew-members and incoming passengers will be undertaken at:

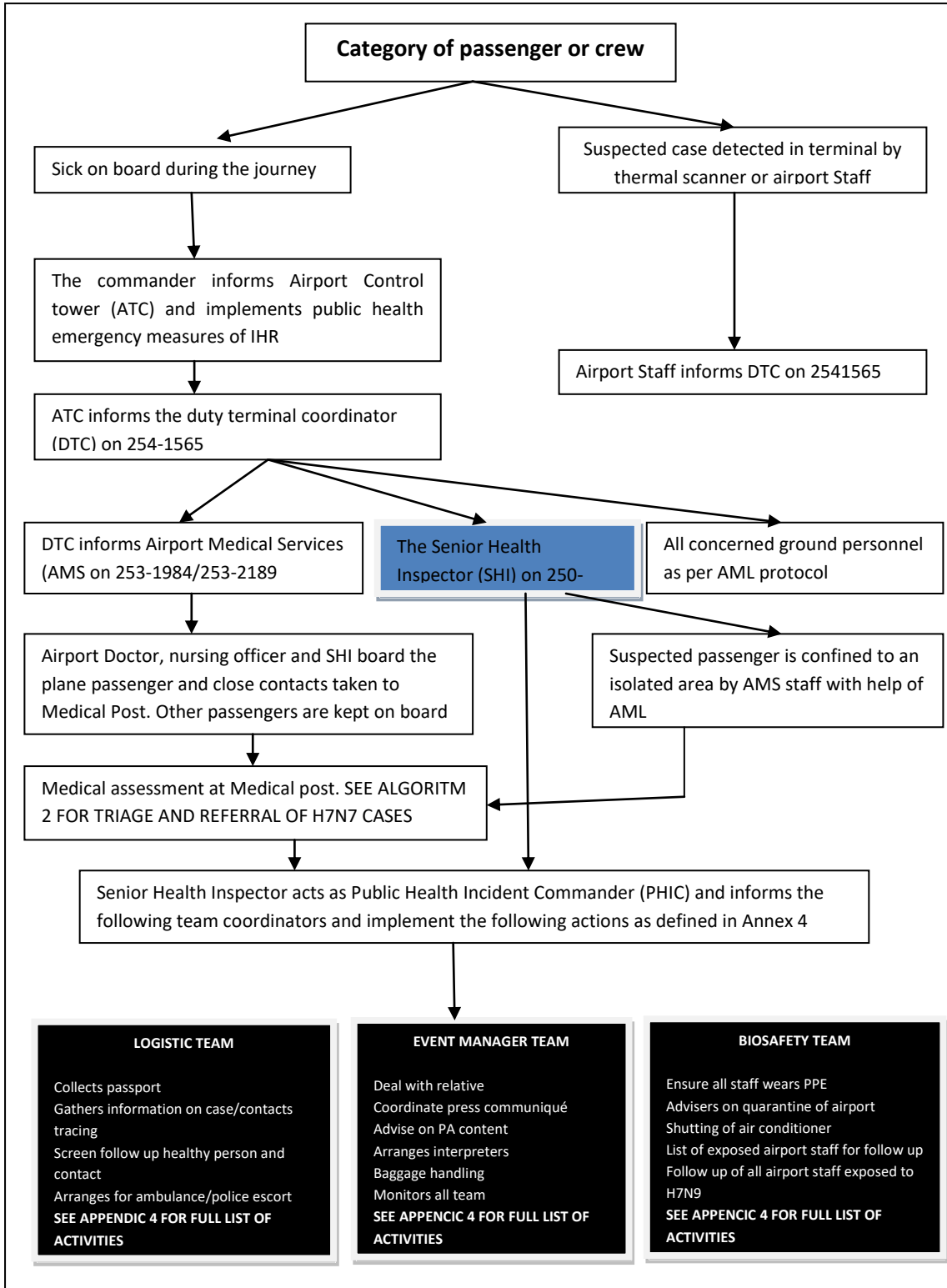
1. Airport
2. Sea port
3. Hotels and guest houses
4. In addition community-level surveillance will be done.

Figure 1 shows the algorithm for screening crew-members and incoming passengers from airport and sea ports. The following procedures will be followed:

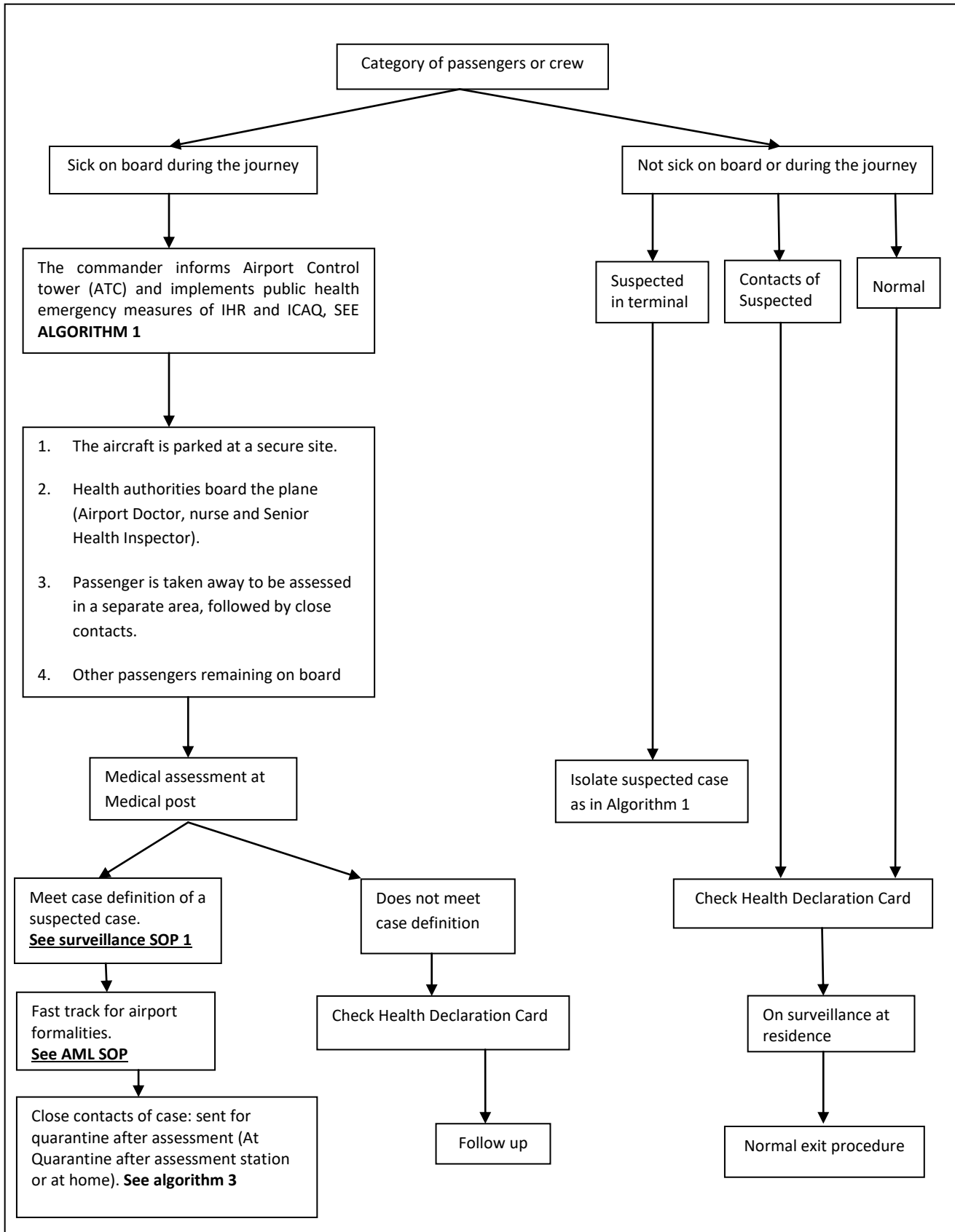
### **2.2.1 Action 1: implement SOP for monitoring arrival from MERS-CORONAVIRUS from endemic areas presently from Middle-East**

1. Compulsory completion of Health Declaration Form
2. Health authorities Senior Health Inspectors follow up all passengers from high risk areas for 7 days post arrival
3. Is a passenger develops flu like symptoms
  - a. The respective Regional Health RMO conducts a medical examination using standard case definition criteria by Surveillance SOP number 2
4. If subjects meet case definition of suspected criteria,
  - a. The subject is sent to isolation facilities at a designated hospital/health institution.
  - b. Close contacts of the suspected case are sent for quarantine station or home-confinement for seven days
  - c. Specimens for MERS-CORONAVIRUS isolation is taken following instruction of Surveillance SOP number

**ALGORITHM 1: CASE MANAGEMENT OF MERS-CORONAVIRUS FOR INCOMING PASSENGERS**



**ALGORITHM 2: TRIAGE AND REFERRAL OF INCOMING PASSENGERS OF MERS-CORONAVIRUS**



### 2.2.2 Action 2: implement SOP for enhanced surveillance at the community level

1. Collect specimens of throat swabs by surveillance SOP number 3 from all 5 regional hospitals on a weekly basis from patients with flu-like illness (ILI)
2. Collect similar specimens from private clinics
3. Characterize for MERS-CORONAVIRUS by Surveillance SOP number 3

## 2.3 Health sector readiness

The following actions are required to get strengthen the health sector readiness.

### 2.3.1 Action 1: Stock piling of medicine and supply

1. First conduct an assessment of available stock of medicine, supplies and equipment by means of health readiness SOP number 1.
2. Second stock pile the supplies for over a 2-3 month period

### 2.3.2 Action 2: Develop all protocols

1. Compile a list of protocols and SOP to be used in the pandemic phase by reference to Appendix 3
2. Develop and field test the protocols accordingly

### 2.3.3 Action 3: Build manpower

- A cadre of doctors and health care personnel including nurses, health inspectors and technicians conducting training in the following areas:
  - Implement surveillance in accordance with surveillance SOP numbers
  - investigation,
  - detection and management of suspected and confirmed cases of MERS-CORONAVIRUS in accordance with surveillance SOP numbers
  - Proper use of PPE in accordance with containment SOP number
  - Bio-safety for patients handling, environmental hygiene in accordance with containment SOP number

## 3 ACTIONS TO BE TAKEN WHEN THERE ARE ONLY IMPORTED CASES OF MERS-CORONAVIRUS IN MAURITIUS

## **3.1 Coordination**

### **3.1.1 Action 1: activate the intersectoral committee headed the Ministry of Health and Wellness**

The intersectoral committee on pandemic implementation will be headed by the Honourable Minister of Health and Wellness. The members from the Ministry of Health and their contact details are given in Appendix 1.

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- Communication with the media shall be channeled via press attaché
- Information pertaining to importation of cases, outbreaks etc will be channeled from the site of occurrence to the appropriate directors by phone and fax
- The directors will inform the minister right away and also other directors
- The directors will delegate actions to be taken to the relevant officers
- All information will be used for action to preempt the spread of the virus and all members of the committee must be informed

### **3.1.3 Action 3: activate the crisis management committee**

Another task of the pandemic committee is to constitute a crisis management committee to reviewing the situation during a pandemic and issuing interim or revised guidelines and SOPs.. The decision making body rests with the Ministry of Health and Wellness and the Head of command is the Hon. Minister of Health& Wellness. Other members include:

- Senior Chief Executive, Ministry of Health& W
- Senior Chief Executive, Prime Minister's Office
- Director General Health Services
- Representative from non-health sectors
- Other representative as deemed necessary according to the gravity of the situation.

## **3.2 Surveillance for the virus in Mauritius**

*Rationale: to detect the first entry of the MERS-CORONAVIRUS virus in Mauritius*

Surveillance for the virus among crew-members and incoming passengers will be undertaken at:

1. Airport
2. Sea port
3. Hotels and guest houses

Figure 1 shows the algorithm for screening crew-members and incoming passengers from airport and sea ports. The following procedures will be followed:

### 3.2.1 Action 1: implement SOP for sick or suspected persons:

1. The commander ( or captain of the ship) puts a mask on the person if available and tolerated or enforces respiratory etiquette and cough hygiene according to *Surveillance SOP number 1*
2. The sick person is segregated from other passengers
3. The close contacts are identified
4. The commander/captain in-charge informs the control tower (for airport) or port authority (for sea ports)
5. The control tower (or port authority) informs the airport doctor or seaport doctor ( for seaports)
6. The aircraft is parked at a secure in the case of yacht or cruise ship, docked outside the harbor
7. Health authorities ( airport/seaport doctors and Senior Health Inspectors) board the plane/vessel
8. Other passengers remain on board for assessment
9. Medical assessment is conducted at medical post using standard case definition criteria by *Surveillance SOP number 2*
5. If subjects meet case definition of suspected criteria,
  - a. the subject is put through fast tract of airport formalities following *algorithm 1 and 2 and AML protocol*
  - b. The subject is sent to isolation facilities at a designated hospital/health institution for triage and management
  - c. Close contacts of the suspected case are sent for quarantine station or home-confinement for seven days
6. If subjects do not meet case definition
  - a. They complete the health declaration card
  - b. Subjects are followed up

### 3.2.2 Action 2: implement SOP for non-sick passengers coming from high risk countries

1. The high risk country is defined a countries where sustained transmission of MERS-CORONAVIRUS exists
2. Consult latest list of countries issued by WHO
3. Check health declaration card
4. Normal exit
5. Follow up in residence or hotel

### 3.2.3 Action 3: implement SOP for enhanced surveillance at the community level

1. Collect specimens of throat swabs by surveillance SOP number 3 from all 5 regional hospitals on a weekly basis from patients with flu-like illness (ILI)
2. Collect similar specimens from private clinics
3. Characterize for MERS-CORONAVIRUS by Surveillance SOP number 3



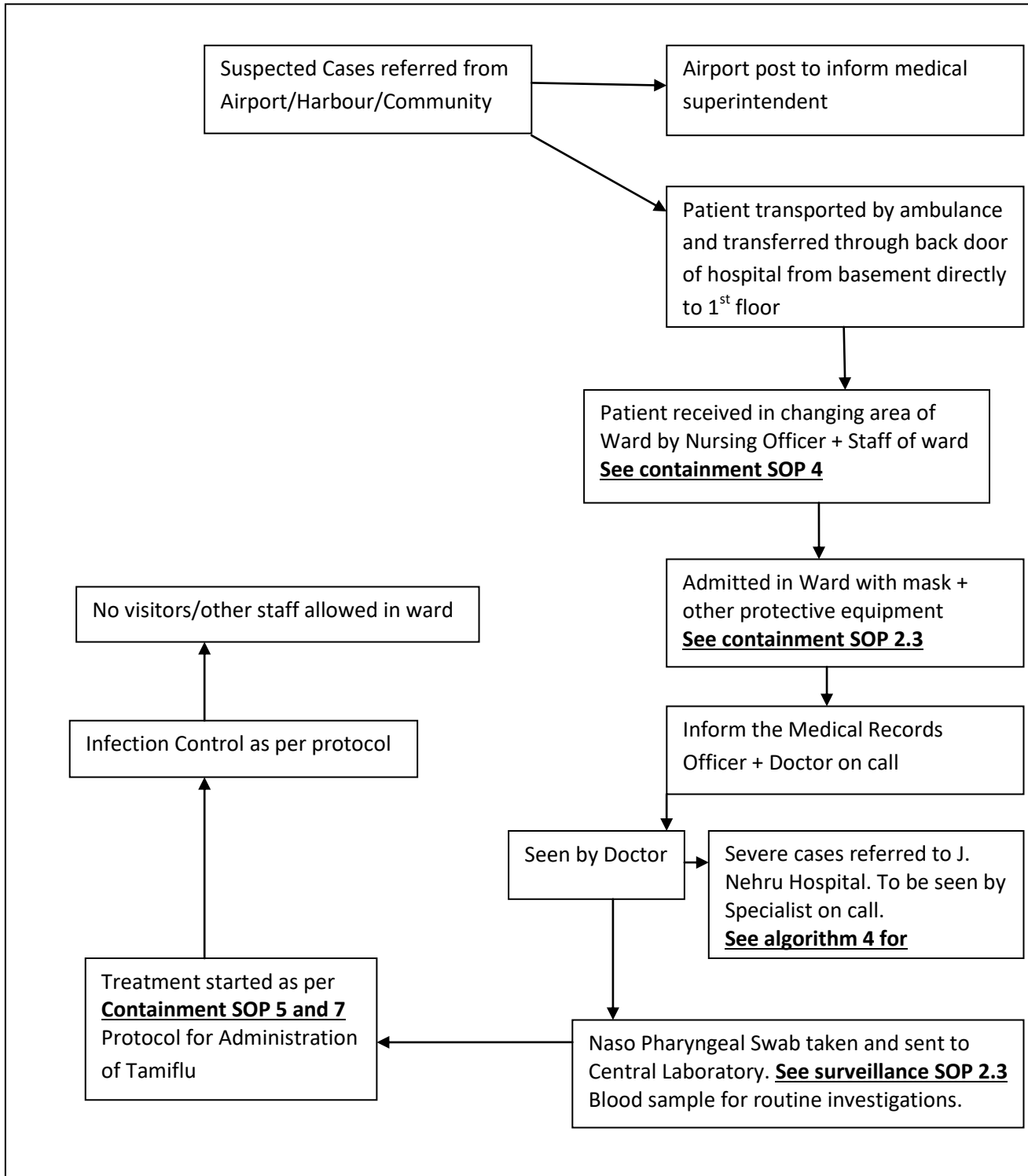
### **3.3 Containment of imported cases**

Rationale: Contain the imported to break the chain of transmission to the general public. Use both non-pharmacological and pharmacological measures.

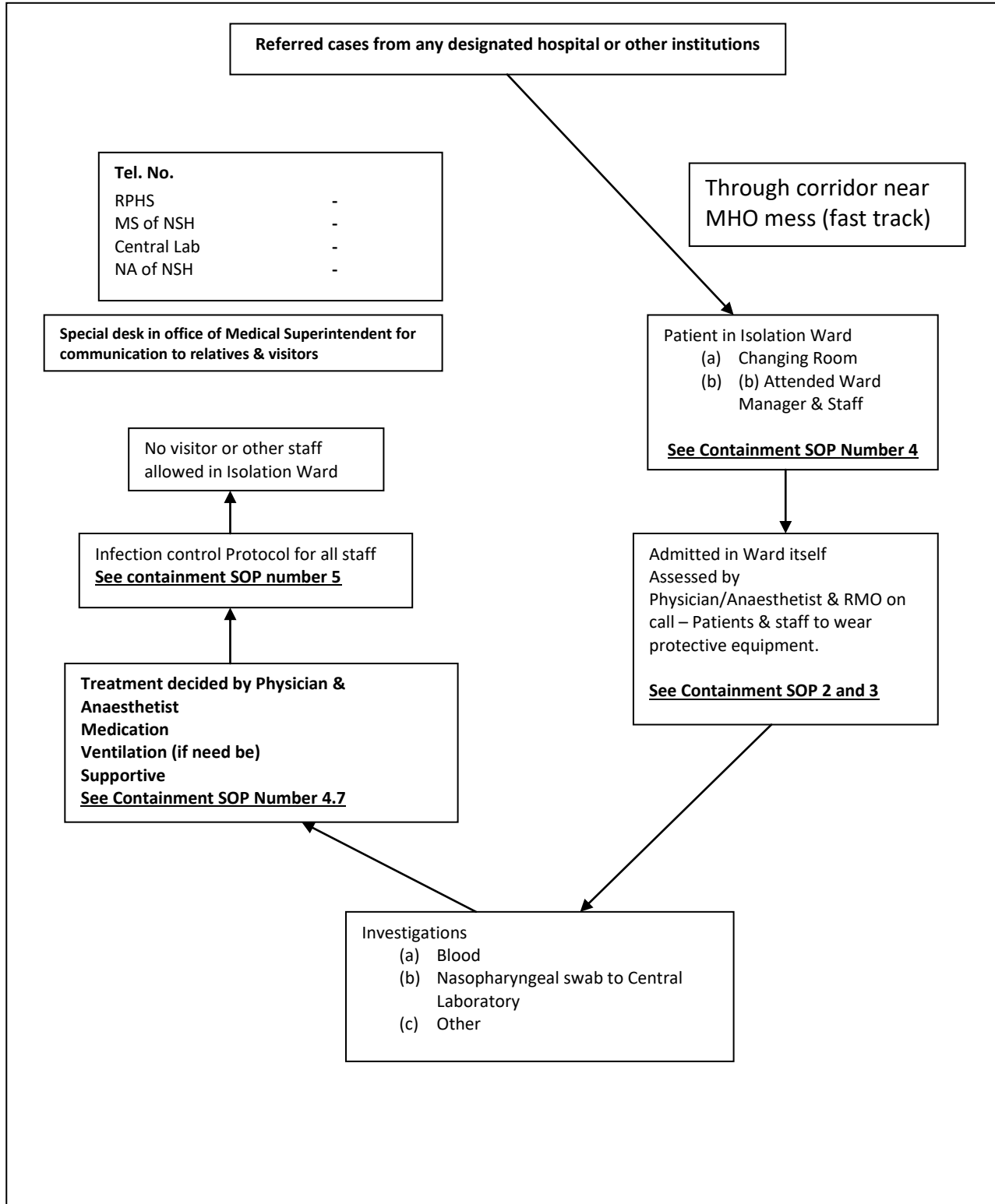
#### **3.3.1 Action 1: Isolation of cases and Quarantine of contacts**

- The imported cases are isolated from the port of entry by implementing the SOP (containment SOP2, 3 4 and 6) shown in Algorithm2 below.

**ALGORITHM 3: ANY DESIGNATED HOSPITAL- WARD MANAGEMENT OF SUSPECTED MERS-CORONAVIRUS CASES FROM AIPORT/HARBOUR AND COMMUNITY**



**ALGORITHM 4: MANAGEMENT OF MERS-CORONAVIRUS PATIENTS IN ISOLATION WARDS AT ANY DESIGNATED HOSPITAL**



### **3.3.2 Action 2: personal and environmental hygiene practices when handling the infected cases.**

Ensure good hospital practice to limit transmission by adhering to the following protocols:

- Containment protocol no 3 on infection control
- Containment protocol no 4 on wearing and disposing of PPE
- Containment protocol no 5 on environmental hygiene

### **3.3.3 Action 3: treatment of imported cases**

Adhere to containment protocol 5 on the use of Tamiflu for:

- Treatment of imported cases
- Prophylaxis or treatment of health care personnel

## **3.4 Health Sector readiness**

### **3.4.1 Action 1: procure medicine, supplies for 2-3 months**

Implementing Readiness Protocol Number 2

### **3.4.2 Action 2: Plan surge capacity for handling increased patients**

- Design protocol for triage of non-life threatening patient
- Design protocol for temporary hospital by capacity for staff and health care facility
- Design a system for training of core staff

### **3.4.3 Action 3: Ensure adequate manpower for health and critical services**

- Create a roster of available workforce of retirees and volunteers
- Design a training system of core staff
- Design protocol for protection of staff health by adhering to containment SOP numbers 5 and 6 on biosafety measures and use of antivirals

### **3.4.4 Ensuring bio-safety for Management of MERS-CoV**

Measures to prevent release the MERS-CORONAVIRUS virus in the environment are ensured by the following action:

- Designing system for Separating infected patients from non-infected patients
- Establishing procedures for Safe handling and disposal of infected laboratory waste
- Instituting Regular environmental cleaning and disinfection
- Institute guidelines for disposal of dead bodies

## 4 ACTIONS TO BE TAKEN WHEN LOCALIZED SECONDARY CASES OCCUR IN MAURITIUS

### 4.1 Coordination

#### 4.1.1 Action 1: increase the frequency of intersectoral committee

#### 4.1.2 Action 2 establish communication strategy within the committee

- Review SOP for communication in order to use the information to contain the spread of the virus
- Establish mechanism for all members of the committee to be informed

#### 4.1.3 Action 3: convene regular meeting of the crisis management committee

Convert the crisis management committee as an advisory group to the pandemic committee

### 4.2 Surveillance for the virus in Mauritius

In addition to implementing the SOPs associated with algorithm 1 for screening crew-members and incoming passengers from airport and sea ports, implement a surveillance and response protocol for sporadic cases in the community level. For use the algorithm 3 at the community level to imp

### 4.3 Containment of infected cases

Rationale: Contain the infected cases to break the chain of transmission to the general public. Use both non-pharmacological and pharmacological measures.

#### 4.3.1 Action 1: Isolation of cases and Quarantine of contacts

- The imported cases are isolated from the port of entry in accordance with containment protocol number 4 shown in figure 2.

#### 4.3.2 Action 2: personal and environmental hygiene practices when handling the infected cases.

Ensure good hospital practice to limit transmission by adhering to the following protocols:

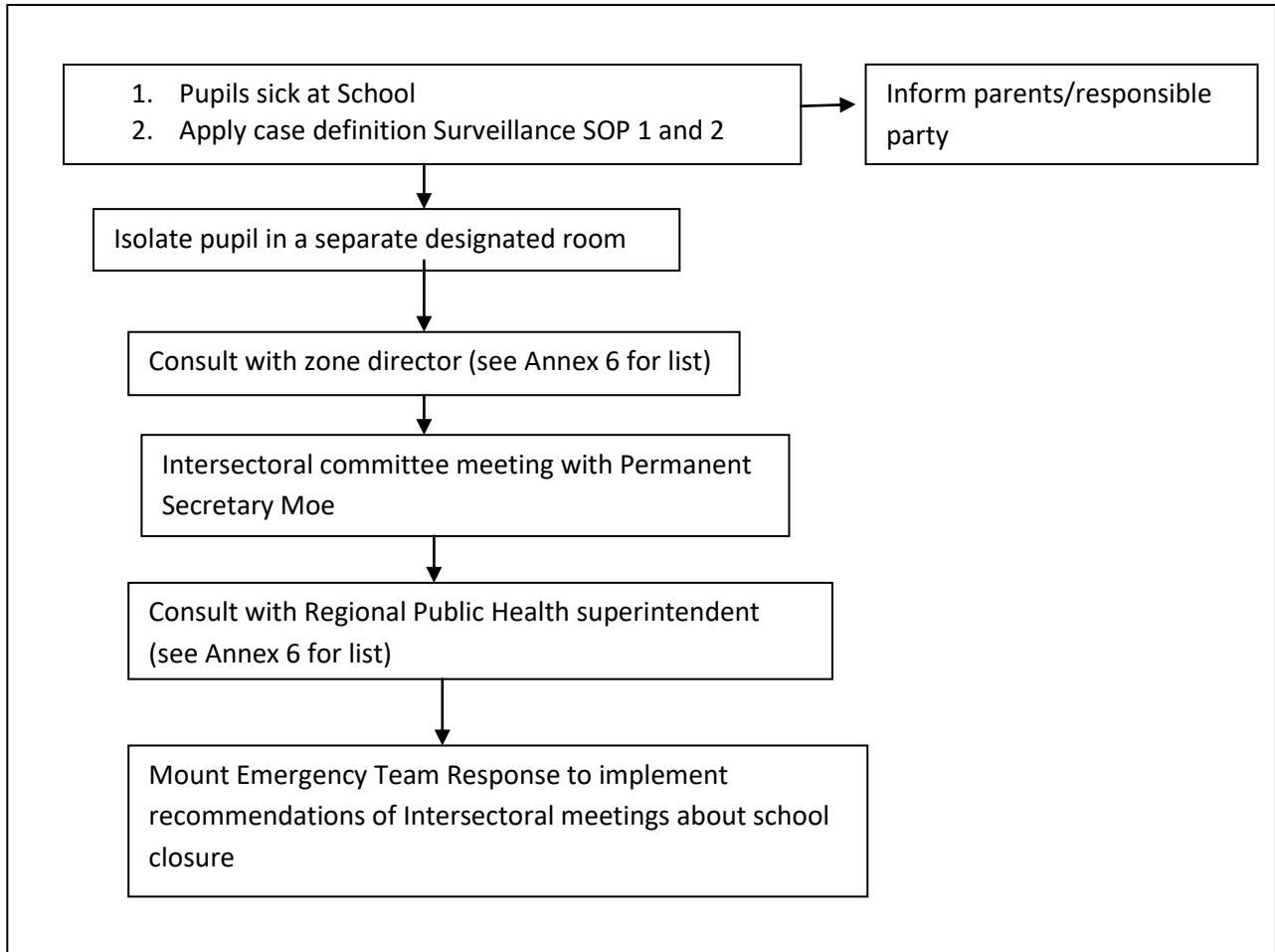
- Containment protocol no 3 on infection control
- Containment protocol no 4 on wearing and disposing of PPE
- Containment protocol no 5 on environmental hygiene

#### 4.3.3 Action 3: zoning and social distancing

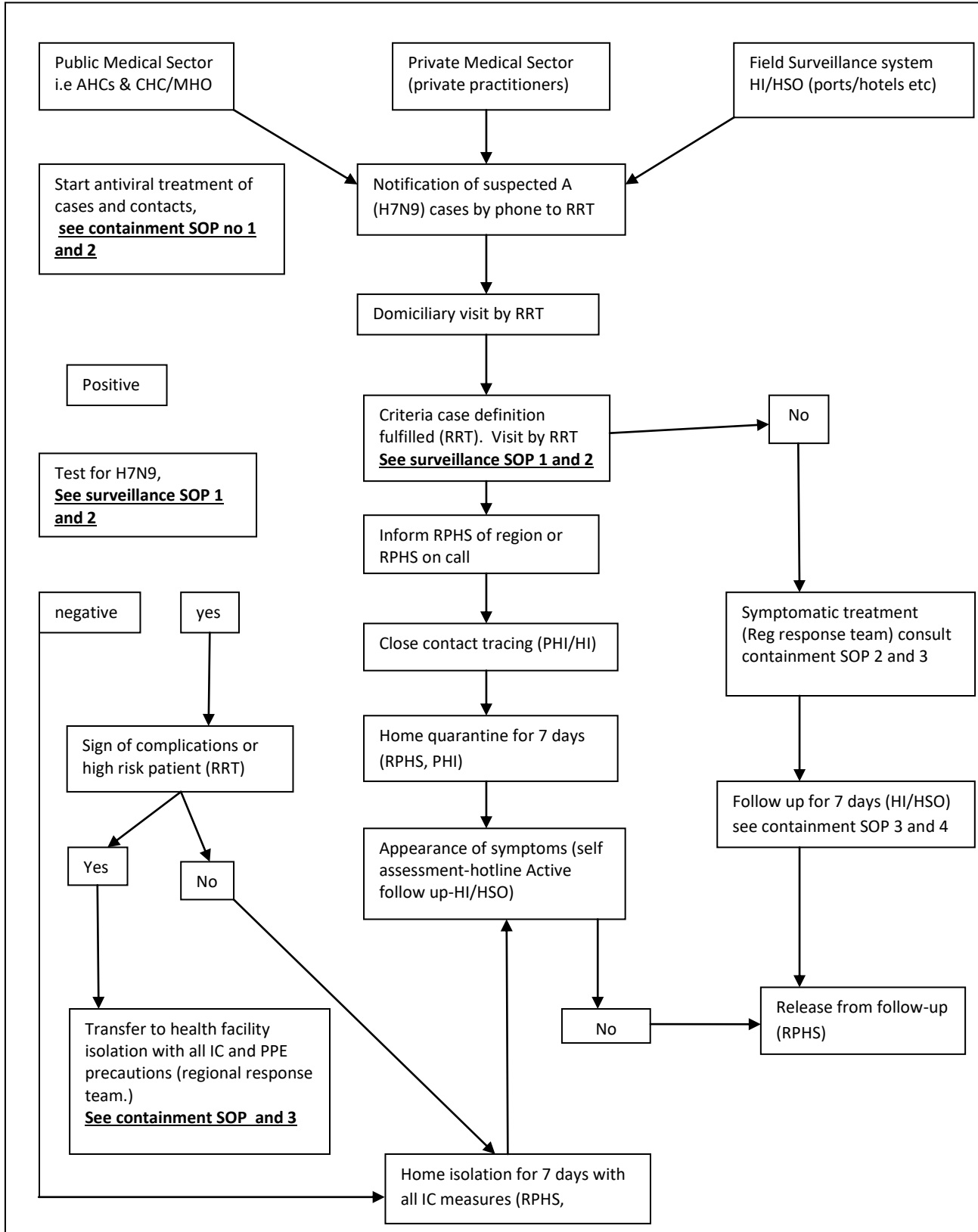
- Design protocol and criteria for closing infected and disinfection of schools, hotels and other public gathering places

- The crisis management committee must meet to discuss the closure of school, hotels and other public places depending on the degree of spread of MERS-CORONAVIRUS in Mauritius and in keeping with WHO and best international practices.
- Algorithm 5 outlines the steps for school closure

### 5 ALGORITHM 5: NOTIFICATION PATHWAY FOR SCHOOL CLOSURE



**6 ALGORITHM 6: ALERT AND RESPONSE FOR MERS-CORONAVIRUS AT THE COMMUNITY-LEVEL**



### **6.1.1 Action 4: treatment of cases**

Adhere to containment protocol 5 on the use of Tamiflu for:

- Treatment of cases
- Prophylaxis or treatment of health care personnel

## **6.2 Health Sector readiness**

### **6.2.1 Action 1: procure enough medicine, supplies to ensure maintenance of health care and critical care staff**

Implementing Readiness Protocol Number 2

### **6.2.2 Action 2: Plan surge capacity for handling increased patients**

- implement protocol for triage of non-life threatening patient
- Design protocol for temporary hospital by capacity for staff and health care facility
- Design a system for training of core staff

### **6.2.3 Action 3: Ensure adequate manpower for health and critical services**

- review roster of available workforce of retirees and volunteers
- Design a training system of core staff
- Design protocol for protection of staff health by adhering to containment SOP numbers 5 and 6 on biosafety measures and use of antivirals

## **7 ACTIONS TO BE TAKEN WHEN WIDESPREAD TRANSMISSION OF CASES OCCUR IN MAURITIUS**

### **7.1 Coordination**

#### **7.1.1 Action 1: increase the frequency of the intersectoral committee headed the Ministry of Health and Wellness**

#### **7.1.2 Action 2 establish communication strategy within the committee**

- Implement pandemic communication strategy

#### **7.1.3 Action 3: have regular meeting of the crisis management committee**

- Convert the committee to an advisory one

### **7.2 Surveillance for the virus in Mauritius**

Switch from virus surveillance to only a clinical case definition ( use surveillance protocol number nn that may be modified by WHO) for monitoring trends in morbidity and mortality



## **7.3 Institute Mitigation measures to reduce the effects of the pandemic**

### **7.3.1 Action 1: Isolation of cases and Quarantine of contacts**

- Initiate the isolation procedures outlined in algorithm 4 below to implement Containment SOP 2,3,4,5,7 and Surveillance SOP 2,3.

Review the effectiveness of the isolation measures.

### **7.3.2 Action 2: personal and environmental hygiene practices when handling the infected cases.**

Ensure good hospital practice to limit transmission by adhering to the following protocols:

- Containment protocol no 3 on infection control
- Containment protocol no 4 on wearing and disposing of PPE
- Containment protocol no 5 on environmental hygiene

### **7.3.3 Action 3: zoning and social distancing**

- Design protocol and criteria for closing infected and disinfection of schools, hotels and other public gathering places

### **7.3.4 Action 4: treatment of cases**

Adhere to containment protocol 5 on the use of Tamiflu for:

- Treatment of imported cases
- Prophylaxis or treatment of health care personnel

## **7.4 Health Sector readiness**

### **7.4.1 Action 1: procure enough medicine and supplies to ensure maintenance of health care and critical care staff**

Implementing Readiness Protocol Number 2

### **7.4.2 Action 2: Plan surge capacity for handling increased patients**

- implement protocol for triage of non-life threatening patient
- Design protocol for temporary hospital by capacity for staff and health care facility

### **7.4.3 Action 3: Ensure adequate manpower for health and critical services**

- activate roster of available workforce of retirees and volunteers
- implement protocol for protection of staff health by adhering to containment SOP numbers 5 and 6 on biosafety measures and use of antivirals

## **8 Annex 4: A compendium of protocol MERS-CoV**

1. Protocol for surveillance and detection of MERS-CORONAVIRUS
2. Protocol for management of infected patients
3. Protocol for prioritization strategy of mask, antiviral and vaccine when available
4. Protocol for treatment and prophylaxis of health care and essential service staff
5. Protocol for triage of patient to reduce pressure on health care system
6. Protocol for use and disposal of PPE
7. Protocol for waste management and environmental cleaning/disinfection
8. Protocol for specimen collection and handling
9. Protocol for international shipment of specimens
10. Protocol for laboratory diagnosis of MERS-CORONAVIRUS

## 9 Annex 5: duties of Senior Health Inspector in capacity of PHIC

team	Contacts/names tel numbers of members	Duties	SOP/clues
<b>Logistic team coordinator</b>		Collects passport	Excise precautions it might be infected, use PPE
		Gathers information on case/contacts	Gets information from PAX list from manifest of airline Get sitting configuration on board Include PAX within 1 meter radius OR 2 adjoining rows
<b>Event manager coordinator</b>		Screen follow up healthy person and contact	Arrange with tour operator to get addresses of contacts Get help of AML to get sitting configuration and trace
		Arranges for ambulance	One standby and permit for next one to come
		Ensures hospitalization/quarantine of cases	Use persuasion for family protection If recalcitrant refer to director
		Deal with relative	Stress importance to spreading to family Get police help in crowd control
		Coordinate press communiqué	All passengers to report to health centre when they develop symptoms
		Advices on PA content	Same message
<b>Biosafety coordinator</b>		Arranges interpreters	Usually search among tour operators/other passengers
		Baggage handling	Liaise with customs for keeping and later delivery
		Monitors all team	Make sure SOP are followed and solve any real time problem
		Coordinates with director of health services-preventive	Relate progress and problem to director right away
		Supplies and implement use of PPE by all staff	Ensure stock at airport
		Advices on quarantine of airport	
	Shutting of air conditioner	If case was exposed next to air-conditioning unit	
	List of exposed airport staff for follow up	Get from AML	
	Disinfectant of airplanes	Refer to WHO rules and contractor/ground handler	
	Environmental cleaning of airports	See containment SOP number 6 for use of disinfectant	

## 10 Surveillance SOP number 1: Case definition of human (MERS-CORONAVIRUS) virus infection

Currently based on CDC guidelines

1. A **Suspected** case of (H1N1, 2009) virus infection is defined as a person with acute febrile respiratory illness (\*1) with onset
  - within 10 days of close contact (\*2) with a person who is a confirmed case of (MERS-CORONAVIRUS 2013) virus infection or
  - within 10 days of travel to an area where there are one or more confirmed (MERS-CORONAVIRUS 2013), or
  - resides in a community where there are one or more confirmed MERS-CORONAVIRUS (2009) influenza cases.
  
2. A **Probable Case:** A patient with illness compatible with influenza for whom laboratory diagnostic testing is positive for , negative for H<sub>1</sub>, negative for H1pdmo9, and negative for H<sub>3</sub> by real-time reverse transcriptase polymerase chain reaction (RT-PCR), and therefore unsubtypeable.
  
3. A **confirmed case** of (MERS-CORONAVIRUS) virus infection is defined as a person with an acute febrile illness with laboratory confirmed (MERS-CORONAVIRUS) virus infection by one or more of the following tests:
  1. Real-time RT – PCR
  2. Viral culture

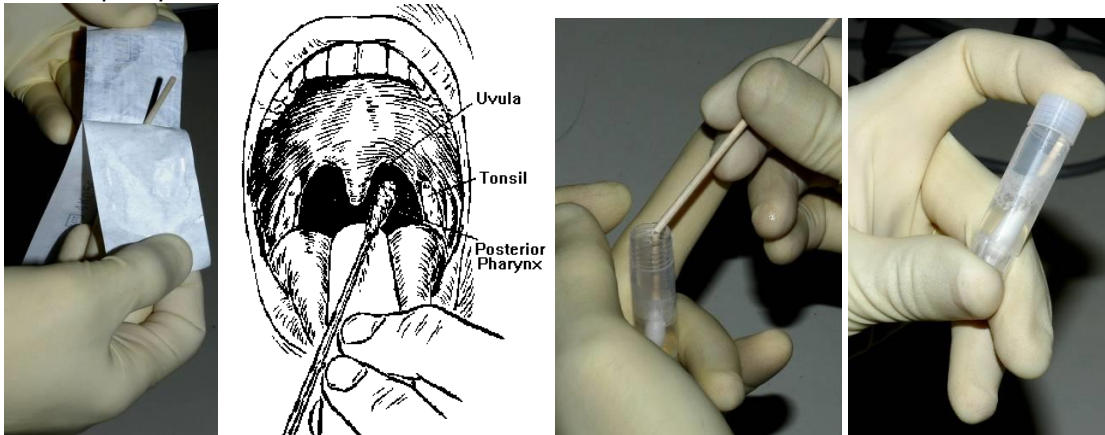
\*1 Acute respiratory illness is defined as recent onset of at least two of the following: rhino rhea or nasal congestion, sore throat, cough (with or without fever or feverishness).

\*2 Close contact is defined as:- within about 6 feet of an ill person who is a confirmed or suspected case of (MERS-CORONAVIRUS) virus infection.

## 11 Surveillance SOP number 2: Specimen Collection procedure (version 1 date: September 6, 2021)

A laboratory investigation form (see surveillance SOP number 4) should be filled with the patient's data  
Obtain a VTM cryovial from -20°C and melt it by twirling between your fingers

1. Wear gloves when sampling and dispose of all materials as potentially infectious waste.
2. Use sterile non-cotton swabs. Open (peel off the paper covering from) the swab and cryovial using sterile technique.
3. It may be helpful to have an assistant open the cryovial for you.
4. Swab the patient's posterior pharynx and tonsils, rolling the swab to scrape the mucosa.
5. A tongue depressor and asking the patient to vocalize (say 'AAH') may aid in accessing the posterior pharynx.



6. Place the tip of the swab into the medium in the cryovial and break it off ensuring that the remaining portion of the stick will not prevent tight sealing of the cap.
7. Wipe the tube down with alcohol. Place a liquid-nitrogen-safe label on the tube or mark it with an alcohol safe marker giving the specimen same number on the laboratory form.

## 12 Surveillance SOP number 3: Guidance on Specimen storage and transport

### ***Duration of Viral Shedding***

People may be contagious from one day before they develop symptoms to up to 7 days after they get sick. Children, especially younger children, might potentially be contagious for longer periods.

**Preferred Respiratory Specimens** --The following should be collected as soon as possible after illness onset: nasopharyngeal swab/aspirate or nasal wash/aspirate. If these specimens cannot be collected, a combined nasal swab with an oropharyngeal swab is acceptable. For patients who are intubated, an endotracheal aspirate should also be collected.

Specimens should be placed into sterile viral transport media (VTM) and immediately placed on ice or cold packs or at 4°C (refrigerator) for transport to the laboratory. Recommended infection control guidance is available for persons collecting clinical specimens in clinics and other clinical settings and laboratory personnel see containment SOP number 2.

### **Swabs**

Ideally, swab specimens should be collected using swabs with a synthetic tip (e.g. polyester or Dacron<sup>®</sup>) and aluminum or plastic shaft. Swabs with cotton tips and wooden shafts are not recommended. Specimens collected with swabs made of calcium alginate are not acceptable. The swab specimen collection vials should contain 1-3 ml of viral transport medium (e.g. containing, protein stabilizer, antibiotics to discourage bacterial and fungal growth, and buffer solution), such as M4RT or the BD Universal Viral Transport System.

**Storing Clinical Specimens** – All respiratory specimens should be kept at 4°C during transport to the Virology Unit of the Central Public Health Laboratory. If transport is not possible, then they can be placed at 70°C freezer is not available, specimens should be kept at 4°C, preferably no longer than 1 week.

Labeling specimen and filing the laboratory request form. All specimens should be labeled clearly with patient name and the laboratory investigation form should be completely filled in and enclosed in a separate envelope

### 13 Surveillance SOP number 4: Laboratory Investigation Form (Version 1: dated 16 September 2013)

Health Region : .....	
Volunteer ID Number (Cryovial number): <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
Date of Collection: dd mm yyyy  <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	Hospital: .....
Patient Information:	
Age: Years <input type="text"/> <input type="text"/> Months <input type="text"/> <input type="text"/> Gender: Male <input type="checkbox"/> Female <input type="checkbox"/>	
Residence (city): .....	
Date of onset of illness      dd mm yyyy  <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
History of travel to high risk area    Yes <input type="checkbox"/> No <input type="checkbox"/>	
If yes country visited: .....	Duration of stay: .....
Contact with someone suffering from MERS-CoV:.....	
Date Specimen sent to the laboratory:    dd mm yyyy  <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
Date Specimen received in the laboratory:    dd mm yyyy  <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
Condition of specimen on receipt: Frozen <input type="checkbox"/> Cold <input type="checkbox"/> Room temperature <input type="checkbox"/>	
Signature: .....	



**Date:** .....

## 14 Surveillance SOP Number 5 Laboratory Testing Guidance

**Tell-tale sign for MERS-CORONAVIRUS (2013):** Any isolate that is non typable by the currently available WHO reagent or giving low reactivity should be further tested for MERS-CORONAVIRUS (2009) by the recommended tests below.

### **Recommended Tests for MERS-CORONAVIRUS( A/2013)**

Real-time RT-PCR for , B, H1, H3 in WHO Reference Laboratory is recommended. Currently, (MERS-CORONAVIRUS) virus will test positive and negative H1 negative for H1pdm09 and negative for H3 by real-time RT-PCR. If reactivity of real-time RT-PCR for is strong (e.g. Ct≤30) it is more suggestive of a novel virus. Confirmation as (MERS-CORONAVIRUS) virus is performed at WHO Coordinating Centres.

**Rapid antigen test** – Also, these tests have unknown sensitivity and specificity to detect human infection with (MERS-CORONAVIRUS) virus in clinical specimens, and have suboptimal sensitivity to detect seasonal influenza viruses. Therefore, a negative rapid test could be a false negative and should not be assumed a final diagnostic test for influenza infection.

**Viral culture** – Isolation of (MERS-CORONAVIRUS) virus is diagnostic of infection, but may not yield timely results for clinical management. A negative viral culture does not exclude infection with (MERS-CORONAVIRUS) virus.

Shipping of specimens/isolate to WHO collaborating Centre: Any specimen that cannot be confirmed by

## 15 Containment SOP number 1: illustration of proper hand- washing



## 16 Containment SOP Number 2: use of PPE (version 1 dated 5<sup>th</sup> June 2009)

All health care workers providing care for suspected or confirmed MERS-CORONAVIRUS (2013) patients should use PPE. The following steps are reemphasized:

- Perform hand hygiene, preferably with an alcohol-based hand rub or soap and water.
- Put on a fluid-resistant gown.
- Put on disposable particulate respirator.
- Perform user seal check of particulate respirator.
- Put on hair cover (if used, e.g. during an aerosol-generating procedure).
- Use face shield or goggles.
- Put on gloves (make sure gloves cover cuffs of gown sleeves).
- Shut the door after entering/leaving.


After performing the procedure, leave the isolation room/area or the ante room and observe the following steps:

- Remove gloves and discard in biomedical waste bin (gloves may be peeled from hands when gown is removed).
- Perform hand hygiene, preferably with an alcohol-based hand rub or soap and water.
- Remove protective eyewear and discard in biomedical waste bin.
- Remove hair cover and discard in biomedical waste bin.
- Remove medical mask or particulate respirator by grasping elastic band; do not touch front of particulate respirator (fronts of masks may be contaminated) and discard in biomedical waste bin.
- Perform hand hygiene preferably with an alcohol-based hand rub or soap and water.


## 17 Containment SOP number 3: Illustration of how to wear and dispose PPE (version 1: dated Tuesday April 16, 2013)

HOW TO PUT ON AND TAKE OFF  
Personal Protective Equipment (PPE)


**How to put on PPE (when all PPE items are needed)**



**Step 1**  
- Identify hazards & manage risk. Gather the necessary PPE.  
- Plan where to put on & take off PPE.  
- Do you have a buddy? Mirror?  
- Do you know how you will deal with waste?




**Step 2**  
- Put on a gown.




**Step 3a**  
- Put on face shield.

OR




**Step 3b**  
- Put on medical mask and eye protection (e.g. eye visor/goggles)

**Note:** If performing an aerosol-generating procedure (e.g. aspiration of respiratory tract, intubation, resuscitation, bronchoscopy, autopsy), a particulate respirator (e.g. US NIOSH-certified N95, EU FFP2, or equivalent respirator) should be used in combination with a face shield or an eye protection. Do use seal check if using a particulate respirator.




**Step 4**  
- Put on gloves (over cuffs).

**How to take off PPE**




**Step 1**  
- Avoid contamination of self, others & the environment  
- Remove the most heavily contaminated items first


**Remove gloves & gown**  
- Peel off gown & gloves and roll inside, out  
- Dispose gloves and gown safely




**Step 2**  
- Perform hand hygiene



**Step 3a**  
If wearing face shield:  
- Remove face shield from behind  
- Dispose of face shield safely



**Step 3b**  
If wearing eye protection and mask:  
- Remove goggles from behind  
- Put goggles in a separate container for reprocessing  
- Remove mask from behind and dispose of safely



**Step 4**  
- Perform hand hygiene

## 18 Containment SOP 4: Patient Care Checklist

### New (MERS-CORONAVIRUS) See WHO website (www.who.int) for latest version

#### UPON ARRIVAL TO CLINICAL SETTING/TRIAGE

- Direct patient with flu-like symptoms to designated waiting area
- Provide instruction and materials to patient on respiratory hygiene/cough etiquette
- Put medical/surgical mask on patient if available and tolerable to patient

#### UPON INITIAL ASSESSMENT

- Record respiratory rate over one full minute and oxygen saturation if possible
- If respiratory rate is high or oxygen saturation is below 90% alert senior care staff for action
- Record history, including flu-like symptoms, date of onset, travel, contact with people who have flu-like symptoms, co-morbidities
- Consider specialized diagnostic tests (e.g. RT-PCR) (**see surveillance SOP 3,4**)
- Use medical/surgical mask, eye protection, gloves when taking respiratory samples
- Label specimen correctly and send as per local regulations with biohazard precautions
- Consider alternative or additional diagnoses
- Report suspected case to local authority

#### INITIAL AND ONGOING PATIENT MANAGEMENT

Supportive therapy for new (MERS-CORONAVIRUS) patient as for any influenza patient including:

- Give oxygen to maintain oxygen saturation above 90% or if respiratory rate is elevated (when oxygen saturation monitor not available)
- Give paracetamol/acetaminophen if considering an antipyretic for patients less than 18 years old
- Give appropriate antibiotic if evidence of secondary bacterial infection (e.g. pneumonia)
- Consider alternative or additional diagnoses
- Decide on need for antivirals\* (oseltamivir or zanamivir), considering contra-indications and drug interactions (**see containment SOP 7**)

#### BEFORE PATIENT TRANSPORT/TRANSFER

- Put medical/surgical mask on patient if available and tolerable to patient

#### BEFORE PATIENT ENTRY TO DESIGNATED AREA

(isolation room or cohort)

- Post restricted entry and infection control signs
- Provide dedicated patient equipment if available
- Ensure at least 1 metre (3.3 feet) between patients in cohort area
- Ensure local protocol for frequent linen and surface cleaning in place

#### BEFORE ENTERING DESIGNATED AREA (isolation room or cohort)

##### STAFF AND VISITORS

- Put on medical/surgical mask
- Clean hands

##### BEFORE LEAVING DESIGNATED AREA

(isolation room or cohort) STAFF AND VISITORS

- Remove any personal protective equipment (gloves, gown, mask, eye protection)
- Dispose of disposable items as per local protocol
- Clean hands
- Clean and disinfect dedicated patient equipment and personal equipment that has been in contact with patient
- Dispose of viral-contaminated waste as clinical waste (**see containment SOP 6**)

#### BEFORE DISCHARGE OF CONFIRMED OR

#### SUSPECTED CASE

- Provide instruction and materials to patient/caregiver on respiratory hygiene/cough etiquette
- Provide advice on home isolation, infection control and limiting social contact

- Record patient address and telephone number

**AFTER DISCHARGE**

- Dispose of or clean and disinfect dedicated patient equipment as per local protocol
- Change and launder linen without shaking
- Clean surfaces as per local protocol
- Dispose of viral-contaminated waste as clinical waste

**(See containment SOP 6)**

## **19 Containment SOP number 5: Infection control for Inpatient Ward Management (version 1: dated September 2013)**

### ***Patient Separation***

- Patients should be kept separately in designated multi-bed rooms or wards.
- The distance between beds should be more than 1 m and beds should preferably be separated by a physical barriers (e.g. partition).
- If achieving 1 m separation between beds is not feasible, beds should have alternating head-to-toe positioning to maximize the distance between the heads of patients.
- A surgical or procedure mask should be worn by all caregivers/staff when in close contact (i.e. < 1 m away) with any patients. Masks are not necessary if not in close contact with patients.
- If sufficient stocks exist, surgical/procedure masks are also recommended for patients when they are in close contact with others. This may not always be feasible (e.g. when the patient is on oxygen therapy) and thus patients must be encouraged to cover coughs/sneezes with a cloth or to cough/sneeze into their sleeve at all times.
- Movement and transport of patients from the room should be limited to essential purposes only. If transport is necessary, patients should wear a surgical or procedure mask when outside their room/area.
- Protocols for visitation by close relatives should be in place, and surgical or procedure masks made available for their use.
- Inpatient wards should have clinical equipment (e.g. sphygmomanometer, thermometer) dedicated to their exclusive use if possible. If not, disinfection with alcohol-based disinfectant should be carried out between patients.
- Patient examination must be minimized to such that will alter treatment only.

### ***Entry to/exit from respiratory inpatient ward***

- Minimise contact between health-care workers and patients as much as possible.
- Only clinical workers who have been educated about influenza should enter the room.
- Ensure that anyone who enters the ward wears appropriate PPE (mask and goggle/visor) if close contact with patients is anticipated.
- If contact with the patient's blood, body fluids/secretions is anticipated, also wear clean, non-sterile gloves and gown (plastic apron if gown is permeable) when entering the room.

### ***Entering the respiratory inpatient ward***

- Collect all equipment needed.
- PPE should be put on (and removed) outside the isolation room (see diagrams below for putting on PPE)
- Enter the room.

### ***Leaving the respiratory inpatient ward***



- If only masks and goggles/visors are used (close contact but no aerosol-generating procedures performed).
- Remove masks by grasping elastic behind ears or ties – do not touch front of mask – and place in biohazard plastic bag; perform hand hygiene.

If several PPE in the correct order (e.g. performing aerosol-generating procedures):

- Remove PPE in the correct order (see diagrams below for removing PPE).
- Remove gloves (peel from hand and discard into biohazard plastic bag).
- Remove gown (place in biohazard plastic bag). Gloves and gowns may be removed at the same time.
- Use alcohol-based hand rub or wash hands.
- Remove eyewear (goggles) – do not touch front of goggles – and place in biohazard plastic bag for disinfection and reuse.
- Remove mask – by grasping elastic behind ears or ties – do not touch front of mask – and placing in biohazard plastic bag.
- Use alcohol-based hand rub or wash hands again.

## ***Hand hygiene***

Each individual having direct contact with (touching) patients must perform hand hygiene:

- before and after patient contact
- after removing gloves
- in case of suspicion of hand contamination after removing gloves, e.g. while undressing after leaving the respiratory inpatient ward.

Routing hand antisepsis is performed either:

- by using preferably an alcoholic hand rub solution if hands are not visibly soiled; or
- washing hands with running water and soap using a single-use clean towel for drying each time. (see containment SOP number 1)

Ensure that hand-eye contact is not made (e.g. wiping of sweat) as transmission can occur via conjunctival mucosa.

## ***Cleaning/waste disposal***

1. Alcohol-based hand-rub or hand-washing facilities should be located within and outside the isolation ward.
2. Reusable items should be placed in a closed recipient or plastic bag.
3. The respiratory inpatient ward must be cleaned each day - including all horizontal surfaces.

4. Cleaning equipment must be cleaned after each use. Mop-heads should be laundered in hot water (at least 70° C). If hot water is not available, soak mop-heads in 0.5% chlorine solution for approximately 15 minutes after washing.
5. Used linen should be placed in a linen bag inside the room. Take immediately to laundry collection area-treat as normal soiled/contaminated linen.
6. All waste should be discarded into a clinical waste-bag inside the room. When waste is to be collected for disposal, treat as “normal” clinical/contaminated/infectious waste.
7. The patient and family should be given appropriate health education messages.
8. Thorough cleaning and disinfection of the bed and room is required after discharge.

## 20 CONTAINMENT SOP NUMBER 6: ENVIRONMENTAL HYGIENE BY DISINFECTANT USE (VERSION 1 DATED September 2013)

Disinfectant	Recommended Use	Precautions
<b>Sodium hypchlorite</b>		
<p><b>Most household bleach solutions contain 5% sodium hypochlorite (50 000 parts per million (ppm) available chorine).</b></p>	<p>Disinfection of material/surfaces contaminated with blood and body fluids.</p>	<p>Irritates mucous membranes, the skin and the airways, decomposes under heat and light, and reacts readily with other chemicals.</p>
<p><b>Rationale</b></p> <p><b>If the initial concentration of the bleach is 5%, 1 part bleach needs to be diluted with 99 parts water to give the final required concentration of 0.05%. Some constant method to measure 99 parts of water and 1 part bleach must be used or underdilution (bleach is too strong) or overdilution (bleach is too weak) may occur.</b></p>	<p>Recommended available chlorine required</p> <p>0.05% or 500 ppm available chlorine</p> <p>Recommended dilution</p> <p>1:100 dilution of 5% sodium hypochlorite is the usual recommendation. To get a 1:100 dilution, use 1 part bleach to 99 parts cold tap-water.</p>	<p>Mix and use in well-ventilated areas.</p> <p>Protective clothing required while mixing, handling and using bleach (mask, rubber gloves and waterproof apron). Goggles are also recommended to protect the eyes from splashes.</p> <p>Mix bleach with cold water because hot water decomposes the sodium hypochlorite and renders it ineffective.</p>
<p><b>Example of how to dilute bleach</b></p> <p><b>Use spoons, cups, glasses, or other utensils commonly available in the community or the bottle cover (of the bleach) as a measuring tool. Let's assume a spoon is the measure of "1part". Using the same spoon, count the number of spoonfuls of water needed to full a cup. This will show how many "parts" a cup contains. Let's say the cup contains 48 parts water (i.e. it took 48 spoonfuls to fill the cup). Therefore 2 cups of water will equal to</b></p>	<p>Adjust ratio of bleach to water as needed to achieve appropriate concentration of sodium hypochlorite, e.g. for bleach preparations containing 2.5% sodium hypochlorite, use twice as much bleach (i.e. 2 parts bleach to 98 parts water)</p> <p>Contact times for different uses</p> <p>Disinfection by wiping of</p>	<p>Do not mix with strong acids to avoid release of chlorine gas.</p> <p>Corrosive to metals.</p> <p>Surfaces must be cleaned of organic materials such as secretions, mucus, vomit, faeces, blood or other body fluids before disinfection or immersion.</p>

Disinfectant	Recommended Use	Precautions
<p><b>96 parts of water. So 99 parts will need 2 cups of water plus 3 further spoons of water. This quantity of water then mixed with one spoon of bleach gives approximately the right dilution of 99 parts water to 1 part bleach.</b></p>	<p>nonporous surfaces: a contact time of <math>\geq 10</math> min is recommended. Disinfection by immersion of items: a contact time of 30 min is recommended.</p>	
<b>Alcohol</b>		
<p><b>For example isopropyl 70% ethyl alcohol 60%.</b></p>	<p>Small surfaces (e.g. rubber stoppers of multiple-dose medication vials and thermometers) and occasionally external surfaces of equipment (e.g. stethoscopes and ventilators)</p>	<p>Flammable, toxic, to be used in well-ventilated areas and only on small surfaces, avoid inhalation.</p> <p>Keep away from heat sources, electrical equipment, flames, hot surfaces.</p> <p>Allow it to dry completely, particularly when using diathermy, as this may cause burns.</p> <p>May cause discoloration, swelling, hardening and crackling of rubber and certain plastics after prolonged and repeated use.</p>

## 21 Containment SOP number 7: Protocol for Antiviral Therapy for MERS-CORONAVIRUSflu (version 1: dated September 2013)

### **Prophylaxis**

1. Close household contacts of a confirmed or suspected case
2. Health care providers or public health workers who were not using appropriate personal protective equipment during close contact with a confirmed or suspected case

Adult dose: Oseltamivir (Tamiflu) (o) 75 mg twice daily for 10 days

Pediatric dose: < 3 months not recommended

(age <1 year) 3-5 months 20 mg (o) o.d

6-11 months 25 mg (o) o.d

Age (>1 year) <15 kg: 30 mg (o) o.d

15-23 kg 45 mg (o) o.d.

23-40 kg: 60 mg (o) o.d

>40 kg: adult dose

### **Treatment:**

1. Adult

Oseltamivir: 75 mg (o) b.d for 5 days

2. Pregnancy:

Potential benefit to be weighed against potential risk to the embryo/or foetus

3. Pediatrics age < 1year

< 3 months: 12 mg (o) b.d.x 5days

3-5 months: 20 mg (o) b.d x 5 days

6-11 months: 25 mg (o) b.d.x 5 days

Age (>1 year) <15 kg: 30 mg (o) o.d x 5 days

15-23 kg 45 mg (o) o. x 5 days

23-40 kg: 60 mg (o) o.d x 5 days

>40 kg: adult dose

*This is a protocol for general guidance. Individual clinicians will need to take decisions for treatment*

## **22 Preparedness SOP number 1: Supply Checklist for Pre-Positioning (version 1 dated September 2013)**

- Masks – surgical or procedure masks
- Masks – particulate respirators (e.g. NIOSH-certified N95, EU FFP2 or equivalent masks)
- Gloves – latex, examination gloves, single-use, non-sterile for clinical use (sizes: S,M,L)
- Protective eyewear if possible (face shield)
- Hand-washing soap or hand-disinfectant/alcohol-based gels
- Gowns (plastic apron, disposable)
- Biohazard plastic bags for used personal protective equipment
- Boxes for sharp objects
- Disinfectants for health-care setting
- Rubber gloves and boots (reusable) for environmental cleaning and burial teams
- Stretchers, body-bags for burial teams
- Antiviral medications (oseltamivir 75 mg, see below)
- Antibiotic medications
- Intravenous fluids/cannulae/giving sets

## 23 Preparedness SOP number 2: Calculation of and inpatient supplies (version 1: dated September 2013)

Item	Quantity	Formulation	Cost of 1 course (MRU)
<b>Oseltamivir (for treatment)</b>	A 5-day course for 15-35% of staff. Increase by 10% for a buffer (2 pills per day).	Pack of 10 capsules	
<b>Oseltamivir (for prophylaxis)</b>	Prophylaxis for 100% of staff, for (average of) 6 weeks (1 pill per day).	Pack of 10 capsules	
<b>IV fluids (Ringer lactate and giving sets)</b>	Anticipate 500-600 inpatient admissions.  Average 3 litres/admission =1500-1800.  Average 3 giving sets/admission =1500-1800 giving sets.	Ringer Lactate = 1-litre bags	Variable depending on source
<b>IV Cannulae various gauges</b>	Anticipate 500-600 inpatient admissions.  Average 2 cannulae per day =100-1200 cannulae.	Gauges 14, 16, 18, 20, 22	Variable depending on source
<b>Needles for injection</b>	Anticipate 500-600 inpatient admissions.  Assume all need injectables if hospitalized. Average 2 needles per day = 1000-1200 needles.	Gauge 21	Variable depending on source
<b>Paracetamol</b>	Anticipate 500-600 inpatient admissions (and 3500 outpatient consultations).  Anticipate 20 tablets per patient. Total 82 000 tablets.	500 mg	Variable depending on source
<b>Stationery for records/notes</b>	Up to 3500 seeking care at outpatient department, up to 600 admissions. Case notes, laboratory/referral forms.		Variable depending on source