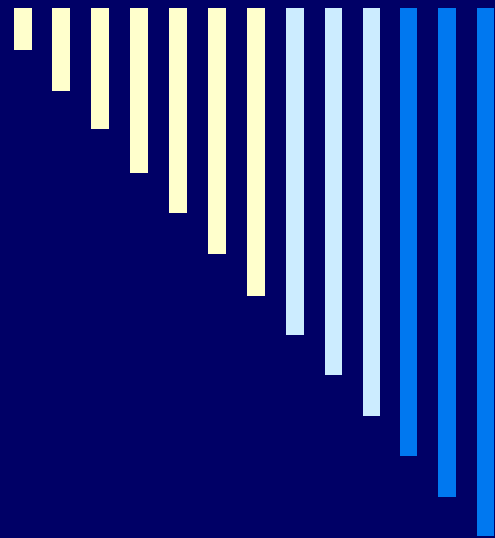


# Influenza A H1N1 infection

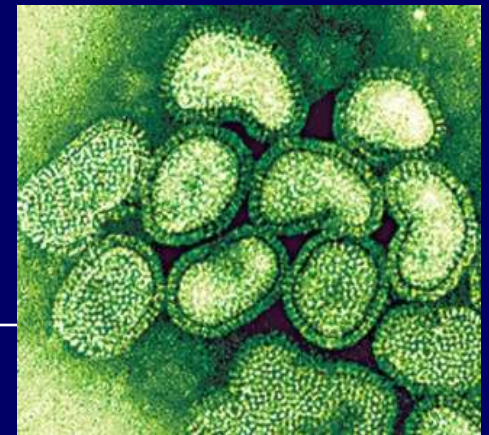
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## Clinical Management of Patient under Investigation

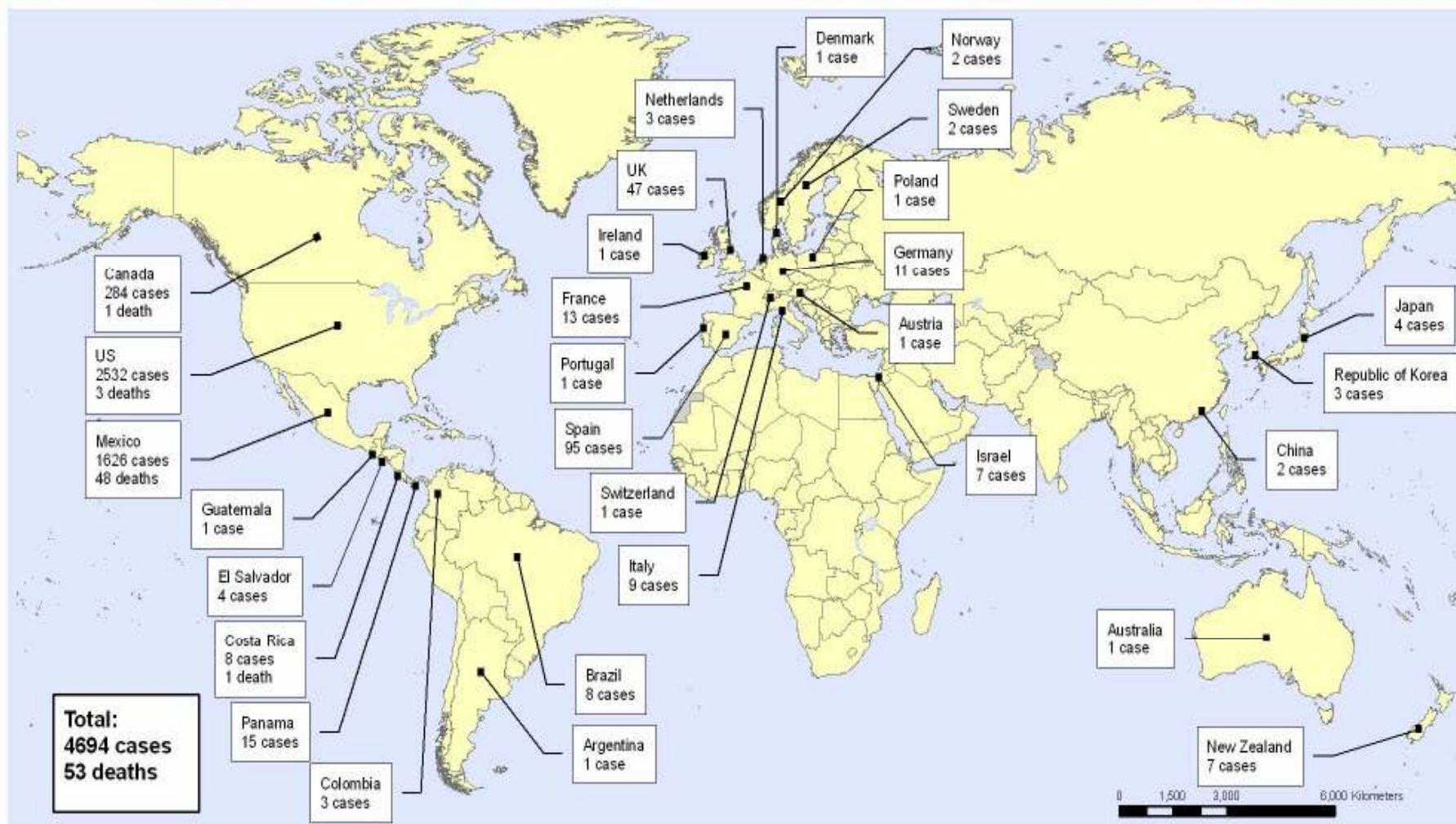


*Hospital Sungai Buloh*



# New Influenza A (H1N1), Number of laboratory confirmed cases and deaths as reported to WHO

Status as of 11 May 2009  
06:00 GMT



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization  
Map Production: Public Health Information and Geographic Information Systems (GIS)  
World Health Organization



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Map produced: 11 May 2009 06:00 GMT



## Case Definitions for Influenza A H1N1 Cases

A **Case under Investigation** of Influenza A / H1N1 virus infection is defined as an individual after 17th of April 2009\*\*, presenting with

- a. high fever  $>38^{\circ}\text{C}$ ,      **AND**
- b. One or more of the following respiratory symptoms: cough, shortness of breath, body ache, difficulty in breathing,      **AND**
- c. One or more of the following: close contact with a person diagnosed as Influenza A/H1N1 **OR** recent travel to an area reporting cases of confirmed Influenza A/H1N1

*(Acute febrile respiratory illness (fever  $> 38^{\circ}\text{C}$ ) with the spectrum of disease from influenza-like illness to pneumonia)*

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\*\* Depends on when the country had its first confirmed case



## Case Definitions for Influenza A H1N1 Cases

A **Probable Case** of Influenza A/H1N1 infection is defined as an individual that fulfill the criteria for a suspected case,

- with an influenza test that is positive for influenza A, but is unsubtypeable by reagents used to detect seasonal influenza virus infection

**OR**

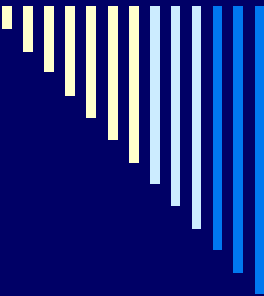
- An individual with a clinically compatible illness or who died of an unexplained acute respiratory illness who is considered to be epidemiologically linked to a probable or confirmed case.

A **Confirmed Case** of Influenza A/H1N1 infection is defined as an individual with laboratory confirmed Influenza A/H1N1 virus infection by one or more of the following tests\*:

- real-time RT-PCR
- viral culture
- 4-fold rise in swine influenza A(H1N1) virus specific neutralizing antibodies

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\* *Note: The test(s) should be performed according to the most currently available guidance on testing.*



## Antiviral Recommendations for Patients with Confirmed or Suspected Influenza A H1N1 Infection

- **Infectious period** for a confirmed case of swine influenza A (H1N1) virus infection is defined as 1 day prior to the case's illness onset to 7 days after onset.
- **Close contact** is defined as: within about 3 feet of an ill person who is a confirmed or suspected case of influenza A H1N1 virus infection during the case's infectious period.
- **Acute respiratory illness** is defined as recent onset of at least two of the following: rhinorrhea, sore throat, cough (with or without fever / feverishness)
- **High-risk groups**: A person who is at high-risk for complications of influenza A H1N1 virus infection is defined as the same for seasonal influenza





# Clinical Features of Influenza A/H1N1

## □ Clinical Findings

Uncomplicated disease manifest with fever, headache, upper respiratory tract symptoms (cough, sore throat, rhinorrhea), myalgia, fatigue, vomiting, or diarrhea.

## □ Complications

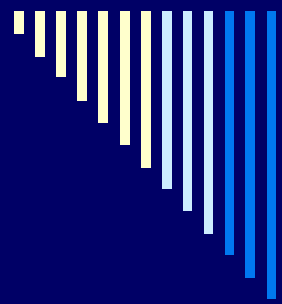
Insufficient information to date about clinical complications of influenza A (H1N1) virus infection. Clinical syndromes have ranged from mild respiratory illness, to lower respiratory tract illness, dehydration, or pneumonia.

Can expect complications similar to seasonal flu: exacerbation of underlying chronic medical conditions, URTIs (sinusitis, otitis media, croup) LRT disease (pneumonia, bronchiolitis, status asthmaticus), cardiac (myocarditis, pericarditis), musculoskeletal (myositis, rhabdomyolysis), neurologic (acute & post-infectious encephalopathy, encephalitis, febrile seizures, status epilepticus), and 2° bacterial pneumonia.



# Disease Characteristics

- With exception of Mexico, the H1N1 virus tends to cause mild illness in otherwise healthy people. Outside Mexico, nearly all cases of illness, and all deaths, have been in people with co-morbidities.
  - In the 2 largest & best documented outbreaks ie. in Mexico & the US, a younger age group has been affected than seen during seasonal epidemics of influenza. Though cases have been confirmed in all age groups, from infants to the elderly, the youth of patients with severe or lethal infections is a striking feature of these early outbreaks.
  - In terms of population vulnerability, the tendency of the H1N1 virus to cause more severe and lethal infections in people with underlying conditions is of particular concern.
-



## High risk groups / Co-morbidities

- ❑ Older age group >65 yr
  - ❑ pregnancy
  - ❑ chronic lung disease (eg., COPD, cystic fibrosis, asthma)
  - ❑ congestive heart failure
  - ❑ renal failure
  - ❑ immunosuppression (due to underlying disease or therapy)
  - ❑ haematological abnormalities (anemia, haemaglobinopathies)
  - ❑ Diabetes mellitus
  - ❑ Chronic hepatic disease
  - ❑ socially unable to cope (i.e., without personal support at home ).
-



## Transmission of Influenza A / H1N1

- Limited data indicate that transmission is similarly as in other influenza viruses. Spread is 1° from person to person through **large-particle respiratory droplets**. This requires close contact between source & recipient, as droplets do not remain suspended in air & travel only short distances (<1m ).
  - **Contact with respiratory-droplet contaminated surfaces** is another possible source of transmission.
  - As data from influenza viruses H1A1 are limited, potential for ocular, conjunctival, or GI infection is unknown.
  - Being a novel influenza A virus, transmission from infected persons to close contacts maybe common. All respiratory secretions & bodily fluids (diarrheal stool) of H1N1 cases should be considered infectious.
-



## Infectiousness & Incubation period

- The estimated incubation period is unknown and could range from 1-7 days, and more likely 1-4 days.
  - H1N1 appears to be more contagious than seasonal influenza. The 2<sup>o</sup> attack rate of seasonal influenza ranges from 5% to 15%. Current estimates of the 2<sup>o</sup> attack rate of H1N1 range from 22% to 33%.
-



## Triage and infection control in health facilities (in all ED & OPDs)

- **Triage and strict infection control** guidelines similar to those during the SARS outbreak are to be implemented in all health facilities and are esp. important in hospitals where patients are treated.
- **Isolation of patients** and their subsequent management should adhere strictly to level of infection control needed to handle such cases.
- The use of **recommended PPEs** by HCWs & the importance of **hand hygiene** should be strictly enforced to prevent staff from being infected. HCWs should be educated regarding such appropriate infection control practices, to prevent spread of influenza and guidelines should be strictly enforced.



# Triage & Screening

- ❑ Special counter set up in A & E of all PI designated hospitals. Should be manned by designated staff.
  - ❑ All patients who come to A & E should be triaged for suspected H1N1
  - ❑ Patients with suspected H1N1 should be diverted to designated exam rooms to ↓ transmission to others.
  - ❑ Suspected patients given a surgical mask to wear
  - ❑ Staff in 1° triage should wear surgical mask with face shield, gloves & to wash hands before & after contact with any patient.
  - ❑ Staff in close contact with suspected PI patients (e.g. examination of patient) must also wear N95 masks, disposable gowns, visors and gloves
  - ❑ If admitted, patient must be taken to the dedicated isolation ward via pre-identified route (exclusive)
  - ❑ Trolley/wheelchair used to transport patient to be disinfected with Sodium hypochlorite 1000 ppm & left to dry
  - ❑ Recommendations to be modified in event of widespread community involvement.
-



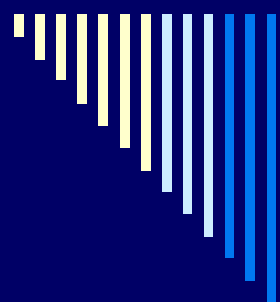
## Triage in ED / OPD: What needs to be done?

- Facilities needed to provide this service:
  - Triage / Information counter\*
  - Holding area
  - Screening / examination room\*\*
  - Changing and un-gowning area/s



## What is needed at Triage counter\*?

- ❑ Clearly written out instructions; well displayed
- ❑ Assigned staff member with appropriate PPEs
- ❑ Attention bell / buzzer
- ❑ Surgical masks for patients



## What is needed in screening / examination room\*\*?

- ❑ Room with good ventilation (negative pressure if possible) ~ with air exchanges of at least 6 cycles/min
- ❑ Some distance from other patient service areas
- ❑ Minimal furniture
- ❑ Essential equipment eg. BP, thermometer, stethoscope, spatula, yellow bins, etc.
- ❑ Decontamination after every patient

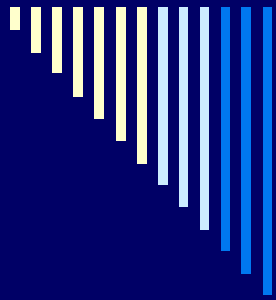


## Hospital Admission policies

- Depending on phase of pandemic, admission policies vary from admitting all probable / suspected cases to only admitting those who are ill or with complications.

**As of  
27<sup>th</sup>. April 09**

- In early phases; to prevent importation or to reduce viral transmission in the country, all suspect influenza H1N1 cases will be admitted in designated hospitals and kept in isolation.
- In full pandemic situation, where cases go beyond capacity of health facilities to cope, a policy of surveillance & Tx. at home or the use of non-traditional health facilities may be instituted. Hospital admissions will only be for those with respiratory distress or with assoc complications of influenza or those in high risk groups (ie.with co-morbidities). Such admission policies will be updated as pandemic evolves.



# Isolation & Infection Control

- \* Cases should be isolated as follows in ↓ order of preference:
    - Negative pressure rooms with door closed
    - Single rooms with bath. (extractor fans if available).
    - Cohort placement (if large number of cases) in an area with an independent air supply, exhaust system and bath facilities
  - \* Turning off A/C & opening windows if independent air supply unfeasible.  
Windows & extractors should not open directly into public places.
  - \* Nursed according to Isolation Procedures for droplet infections.
-



# Cohorting (when isolation facilities are stretched)

## Guidelines for Cohorting:

- Suspect and probable cases should not be nursed together.
- Beds should be placed > 3 feet apart
- Patients use mask when using common areas in cohort area
- Common areas regularly cleaned using std hypochlorite solution
- Good ventilation: with air exchanges of at least 6 cycles/min; an exhaust extractor fan maybe useful.
- Good hand & personal hygiene encouraged among patients including regular hand washing or use of alcohol hand gels.



# Isolation & Infection Control

- All HCWs attending to patient should adhere to the MOH Infection Control Policy at all times
  - All staff, including ancillary staff should be trained in the infection control measures required for care of patients
  - There should be designated ancillary staff
  - Cups & other utensils used by patient should be washed with soap & water before use by other persons. Disposal utensils are an alternative.
  - Movement of patients beyond isolation unit should be avoided. If moved the patients should wear a surgical mask
  - Visitors not allowed into isolation wards except in extraordinary situations. If allowed entry, they should be issued with PPEs & their visit supervised. Prior permission must be obtained from Pengarah & Consultant-in-charge.
- 
- **All non-essential staff should not be allowed into the ward**



## Infection Control

- Standard, Droplet and Contact precautions should be used for all patient care activities, and maintained for 7 days after illness onset or until symptoms have resolved. Maintain adherence to hand hygiene by washing with soap and water or using hand sanitizer immediately after removing gloves and other equipment and after any contact with respiratory secretions.
- Personnel providing care to or collecting clinical specimens from suspected or confirmed cases should wear disposable non-sterile gloves, gowns, and eye protection (e.g., goggles) to prevent conjunctival exposure.





# Masks and respirators

## Recommendations:

- Personnel engaged in aerosol generating activities (e.g., collection of clinical specimens, endotracheal intubation, nebulizer treatment, bronchoscopy, and resuscitation involving emergency intubation or cardiac pulmonary resuscitation) for suspected or confirmed influenza A H1N1 cases should wear a **fit-tested disposable N95** respirator.\*
- Personnel providing direct patient care for suspected or confirmed influenza A H1N1 cases should wear a fit-tested disposable N95 respirator when entering patient's room.
- \*Staff should be fit-tested, and trained for respirator use, including: proper fit-testing and use of respirators, safe removal and disposal, and medical contraindications to respirator use.





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# Work processes in Wards

- Scheduled encounters:
    - Doctors rounds
    - Observations: if stable – at least once a shift
    - Meals & snacks
    - Serving of medicines
  - Merge functions of encounters to reduce number of entries into isolation room.
-



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## Goal: A Cooperative Patient

- Information & instructions (briefing / patient pamphlets)
  - Scheduled encounters informed to patient
  - Improving communication without necessarily increasing physical encounters (eg. Phone, intercom, etc)
  - Room Comforts: drinks, snacks, newspapers (?)
  - Friendly and responsive staff: address patient's concerns
-



## PATIENTS' INFORMATION

### Isolation Ward, Hospital Sungai Buloh

WE understand that this can be a distressing time for you and we shall try our utmost to make your stay here in our isolation ward as comfortable and as brief as possible.

While we await your laboratory results, our ward staff who are available at all times, will provide you with the necessary treatment, care and support.

Your cooperation is much appreciated esp. with regards to the following areas;

- ❑ As there are other patients in the ward, we appreciate that you stay within your room at all times until otherwise instructed by the ward staff.
- ❑ Each isolation room has an attached bathroom and toilet
- ❑ Should you need any assistance : kindly use the call pad
- ❑ The call pad is found at the end of the cord attached to the wall near your bed Just press on the red button on the call pad and the ward staff would respond to your call through the intercom system as soon as possible.

- ❑ The intercom system:  
You can communicate with the ward staff via the intercom. It is attached to the wall above your head board. Just press on the green button & speak through the speaker.
- ❑ Meals and snacks will be served to you in your room at the following times :  
..... etc
- ❑ As this is an isolation ward, visitors are generally not allowed
- ❑ If you need assistance in contacting your family on urgent matters, please contact the ward staff. We shall try our best to assist whenever possible.

We apologize for any inconvenience and discomfort caused but we trust you will understand that these measures are necessary to ensure the continued good health of the society at large.

**THANK YOU FOR YOUR COOPERATION AND UNDERSTANDING**



## Other Needs

- Pregnant women
- Surgical patients
- Dialysis
- Mechanical ventilation
- Children

Principle: Whenever possible keep the patient within the isolation ward (but not at expense of patient safety). There will be necessity to bring in expertise to address the specific patient need.

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# Antiviral therapy

- Oseltamivir & zanamivir can be released for use for suspected, probable & confirmed H1N1 cases (through KPK's approval)
  - Current approach at HSB:
    - Use for probable & confirmed cases
    - In suspected cases:
      - empirical treatment if patients present with complications of influenza eg. Pneumonia, mental confusion, metabolic derangement, etc
      - if patient is clinically comfortable (no complications), treatment deferred till IMR results
  - Duration of treatment: 5 days
-



# Antiviral Therapy

- **Type of Antiviral:** Oseltamivir is the preferred choice; zanamivir might be used as an alternative. The quality of evidence if considered on a continuum, is lower for zanamivir compared to oseltamivir. Clinicians should not administer amantadine or rimantadine alone as a 1<sup>st</sup>. line treatment.

*Since functional groups of the 2 neuraminidase-inhibitors have differences in their binding sites, mutants resistant to 1 drug maybe susceptible to the other.*

- **Oseltamivir** dosage: Duration 5 days (in severe cases, maybe extended)

- **Adults & adolescents > 13 yrs:** 75 mg bd
- For children (according to weight):
  - <15kg: 30mg bd
  - 15-23kg: 45mg bd
  - 23-40kg: 60mg bd
  - > 40kg: 75mg bd

**Renal adjustments:** patients with a serum creatinine clearance between 10 - 30 ml/min are treated with 75 mg once daily for 5 days



# Antiviral Therapy

- **Zanamivir** dosage:
    - 10mg (2 puffs) bd for 5days (Adults & children)
    - (Children < 5 yrs may have difficulty with Diskhaler™)
  - In patients with bronchospasm: Zanamivir is not recommended for the treatment of patients with underlying airways disease (eg. asthma or COPD). Patients with pulmonary dysfunction should always have a fast-acting bronchodilator available and discontinue zanamivir if respiratory difficulty develops.
  - No dosage adjustment is required in patients with renal impairment
  - Not approved yet for prophylaxis
-



## Recommendations for use of antibiotics

General recommendations for antibiotic use:

- ❑ In suspected / probable / confirmed H1N1 cases with pneumonia, clinicians should follow recommendations as stated in the National Antibiotic Guidelines 2008 for CAP.
- ❑ In patients with confirmed / suspected H1N1 infection who do not need mechanical ventilation & have no other indication for antibiotics, clinicians should not administer prophylactic antibiotics .
- ❑ In patients with confirmed / suspected H1N1 infection who need mechanical ventilation and has pneumonia, clinicians should follow clinical practice guidelines for the prevention or treatment of ventilator-associated or HAP.



## MANAGEMENT OF SUSPECTED AND CONFIRMED CASES

Detailed history obtained: clinical, travel and contact history including occurrence of respiratory disease in contact patients during the last 10 days

- ❑ Clinical workup should follow measures stated in Syndromic Approach Protocol for acute respiratory syndromes
- ❑ Virology samples sent to Virology Unit, IMR
- ❑ Bacteriology samples are processed in respective hospitals
- ❑ All specimens should be transported in accordance to KKM Guidelines of Transport of Infectious Material.
- ❑ In event of death, post-mortem should be performed in accordance with KKM Guidelines For Post-Mortems Involving Unknown/Uncertain Infectious Agents
- ❑ Dead bodies handled as per KKM Guidelines on Handling of Bodies with HIV/AIDS



## Supportive Care

- Supportive care should be provided when necessary i.e. oxygen & ventilation support, hydration, blood gas monitoring, nutrition, etc. To ↓ possible spread to HCWs, nebuliser use should be avoided (if possible).
- If mechanical ventilation is required, the critical care team (ICU) will support patient within the isolation ward (if facilities allow). Otherwise, an alternative site for ventilation support must be identified



# DISCHARGE OF PATIENTS

The patients can be discharged with the following criteria:

□ Suspected cases:

When PCR results are negative (IMR)

If patient is still unwell, he can be transferred out of isolation ward

□ Probable & Confirmed cases:

- At least 7 days from onset of illness and
- Completed at least 5 days of antiviral therapy and
- Well / asymptomatic

If the patient has fulfilled the first 2 criteria but is still recovering, he can be transferred out of isolation ward


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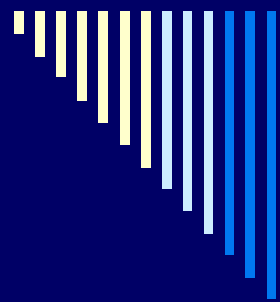


## Staff welfare

- Adequate provision for staff welfare and wellbeing during the pandemic is important to ensure there is enough staff looking after patients.
- Guidelines on prophylactic treatment of staff having symptoms or the like and the prioritization of staff for vaccination when vaccines are made available need to be planned for and made available for implementation when indicated.
- A surveillance system to detect early staff coming down with influenza should be followed.

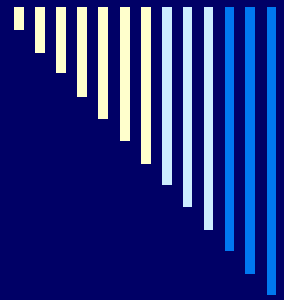
Clear  
System,  
Well  
publicized  
&  
monitored





## Resource Management for Health care Facilities

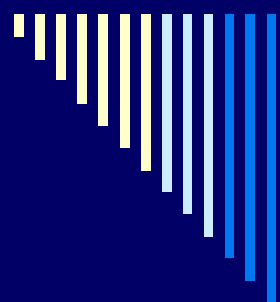
- During an pandemic, demand on health care services expected to  $\uparrow$  , peak &  $\downarrow$  during weeks in which any one location is affected.
- Need for resource management in terms of  $\uparrow$  bed capacity, patient prioritization of usage of facilities, provision of care outside hospitals, critical equipment & supplies, drugs & use of volunteers and voluntary organizations, to help meet demands.
- There is also issue of human resource management in terms of optimal use of HCWs, designated staff for influenza case management, deployment of HCWs, provision of training, immunization, care and support for HCWs.



## Human resource: Clinical

- Medical / Paediatric
- Emergency
- Pathology
- Radiology
- Others: Intensive care, mortuary, etc.

**Training & more  
training ...**



## Targeted Training

- Train enough to have multiple teams that can be rostered to serve 3 – 4 week stints  
(the outbreak is expected to last at least 2-3 months)
- Designated teams so as to ensure high level of adherence to ward procedures / infection control as well as to facilitate staff health surveillance
- Team leaders / “champions”: crucial