INTRODUCTION TO ZOONOTIC DISEASES

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Workshop on One Integrating One Health Concept among Public Health Personnel
Melaka, MALAYSIA
05th October 2015
CONTENTS

• Introduction – definition, transmission, disease spectrum & impact
• Emerging & Re-emerging zoonoses
• Factor influencing zoonoses
• Preparedness and Response
• Conclusion
INTRODUCTION

- Man always in contact with animal
- Animal provide – source of food, means of transport, generate income, means of physical labour, pets and part of our ecosystem.
- However, animal harbour infectious pathogens
- These pathogens may be transmitted to humans cause diseases in man
What is Zoonoses?

“…those diseases and infections that are naturally transmitted between *vertebrate animals* and man with or without an arthropod intermediate.”

- WHO, 2006
‘At least 61% of all human pathogens are zoonotic, and have represented 75% of all emerging pathogens during the past decade.

Mode of Transmission

A + + + → 

B → → → 

C → → → 

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Etiological agents

- **Bacteria:**
  - brucellosis, salmonellosis, shigellosis, yersinia, tuberculosis, listeriosis, leptospirosis, borreliosis, lyme disease, campylobacteriosis, anthrax, glanders, tuleremia, rat bite fever, psitacosis, cat scratch disease.

- **Virus:**
  - monkey pox, St. Louis encephalitis, yellow fever, hantavirus pulmonary syndrome, haemorrhagic fever, viral encephalitis (equine encephalitis), nipah, hendra, rabies, influenza, japanese encephalitis, SARS, Ebola, MERS CoV
Etiological agents

- **Ricketssial**:  
  - Q-fever, rocky mountain spotted fever,

- **Fungus**:  
  - crytococcosis, histoplasmosis, sporotrichosis

- **Protozoa**:  
  - toxoplasmosis, cryptosporidiosis

- **Nematode / Cestode**:  
  - trichinosis, echinococcisis
Spectrum of Disease Severity

Mild illness = *psittacosis*

Chronic illness = *Q*-fever Severe illness = *plague*

Death = *rabies*

Range from asymptomatic to death = *Leptospirosis, Avian influenza*
Zoonoses - Impact... (some figures)

- At least 55,000 people dying of rabies in Asia & Africa
- Annual societal cost of porcine cysticercosis / taenosis – USD 150 million in India alone
- Tibetan plateau – human & animal losses due to echinococcosis – USD 3.45 per person (1.4% per capita GDP)
- Echinococcosis in Tunisia – USD 10 – 19 million annually. 1.5 – 2.05 cases/100,000 pop.
- Echinococcosis - global human burden annually (USD 763,980,979), livestock loss (USD 2,190,132,464)
- More than 50,000 cases human brucellosis in 8 countries in Mediterranean in 2003
ZOO NOSES - BURDEN

- Burden – unknown
- Different from country to country (depend on many factors)
- 10 to 100 times greater than reported
- Many of these diseases – prevalent in developing countries
- Affect the poorest segments of human population
ZOOONOSES – NEGLECTED DISEASES

- Reasons:
  - often most effective control is to deal with animal reservoir – done by veterinary services
  - occur among poor population – reflect limited capacity and coverage of the health services
  - difficulties in diagnosis
  - symptoms and signs are similar with other diseases that prevalent in the area
ZOONOSES - BIOTERRORISM

- Many zoonotic disease agents used in bioterrorism

- Examples:
  - Bacillus anthracis
  - Brucella sp
  - Franciscella tularensis
EMERGING AND RE EMERGING INFECTIONOUS DISEASES

- Estimated 1,415 microbes infectious for human
- 868 (61%) considered zoonotic
- Zoonotic pathogens – twice likely associated with emerging diseases
Emerging & Re-emerging?

- New infections
  - newly recognized
  - newly evolved

- Known infections
  - rapidly increasing in incidence,
  - spreading to new geographic areas or populations

- WHO, 2004
Global distribution of emerging & re-emerging infections


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Malaysian Scenario
Table 1. Examples of novel, emergent zoonotic virus diseases

<table>
<thead>
<tr>
<th>Year of isolation</th>
<th>Place of isolation</th>
<th>Virus</th>
<th>Reservoir/spillover host</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>Venezuela</td>
<td>Guanarito virus&lt;sup&gt;20&lt;/sup&gt;</td>
<td>Rodents</td>
</tr>
<tr>
<td>1992</td>
<td>Slovenia</td>
<td>Dobrava virus&lt;sup&gt;21&lt;/sup&gt;</td>
<td>Rodents</td>
</tr>
<tr>
<td>1993</td>
<td>United States of America</td>
<td>Sin Nombre virus&lt;sup&gt;22&lt;/sup&gt;</td>
<td>Rodents (Peromyscus maniculatus)</td>
</tr>
<tr>
<td>1994</td>
<td>Brisbane, Australia</td>
<td>Hendra virus&lt;sup&gt;23&lt;/sup&gt;</td>
<td>Fruit bats (Pteropus sp.)/horses&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>1995</td>
<td>Sao Paolo, Brazil</td>
<td>Sabia virus&lt;sup&gt;24&lt;/sup&gt;</td>
<td>Rodents</td>
</tr>
<tr>
<td>1996</td>
<td>Florida, USA</td>
<td>Black Creek Canal virus&lt;sup&gt;25&lt;/sup&gt;</td>
<td>Rodents</td>
</tr>
<tr>
<td>1999</td>
<td>Ballina, Australia</td>
<td>Australian bat lyssavirus&lt;sup&gt;26&lt;/sup&gt;</td>
<td>Fruit and insectivorous bats</td>
</tr>
<tr>
<td>1997</td>
<td>Argentina</td>
<td>Andes virus&lt;sup&gt;27&lt;/sup&gt;</td>
<td>Rodents</td>
</tr>
<tr>
<td>1997</td>
<td>Hong Kong (China)</td>
<td>Influenza H5N1&lt;sup&gt;28&lt;/sup&gt;</td>
<td>Wild birds/domestic poultry&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>1997</td>
<td>Menangle, Australia</td>
<td>Menangle virus&lt;sup&gt;29&lt;/sup&gt;</td>
<td>Fruit bats</td>
</tr>
<tr>
<td>1997</td>
<td>Saudi Arabia</td>
<td>Alkhurma virus&lt;sup&gt;30,31&lt;/sup&gt;</td>
<td>Camels and sheep&lt;sup&gt;†&lt;/sup&gt;</td>
</tr>
<tr>
<td>1999</td>
<td>Peninsular Malaysia</td>
<td>Nipah virus&lt;sup&gt;32,33&lt;/sup&gt;</td>
<td>Fruit bats/pigs&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>2000</td>
<td>Peninsular Malaysia</td>
<td>Tioman virus&lt;sup&gt;34&lt;/sup&gt;</td>
<td>Fruit bats</td>
</tr>
<tr>
<td>2002–2003</td>
<td>China, Hong Kong (China)</td>
<td>SARS coronavirus&lt;sup&gt;35-38&lt;/sup&gt;</td>
<td>Bats/civets&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>2003–2004</td>
<td>Viet Nam and China</td>
<td>Influenza H5N1&lt;sup&gt;39,40&lt;/sup&gt;</td>
<td>Wild birds/domestic poultry&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>2007</td>
<td>Melbourne, Australia</td>
<td>Dandenong arenavirus&lt;sup&gt;41&lt;/sup&gt;</td>
<td>Rodents?</td>
</tr>
<tr>
<td>2007</td>
<td>Peninsular Malaysia</td>
<td>Melaka virus&lt;sup&gt;42&lt;/sup&gt;</td>
<td>Fruit bats</td>
</tr>
<tr>
<td>2008</td>
<td>Uganda</td>
<td>Bundibugyo ebolavirus&lt;sup&gt;43&lt;/sup&gt;</td>
<td>Fruit bats?/various animals (bush meat)&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>2008</td>
<td>Lukasa, Zambia</td>
<td>Lujo virus&lt;sup&gt;44&lt;/sup&gt;</td>
<td>Unidentified rodents</td>
</tr>
<tr>
<td>2008</td>
<td>Perak, Malaysia</td>
<td>Kampar virus&lt;sup&gt;45&lt;/sup&gt;</td>
<td>Fruit bats?</td>
</tr>
</tbody>
</table>

* Spillover host; † Tick-borne
EMERGING ZOONOSES – EXAMPLES OF RECENT OUTBREAK

Monkeypox

- First human case reported in 1970 in Zaire
- Before June 2003 – only on African Continent
- June 2003 – reported in USA
EMERGING ZOOONOSES – EXAMPLES OF RECENT OUTBREAK

BSE

- First emerged in 1986 among cattle – UK
- A cluster of human vCJD in 1996 – 10 cases

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**NIPAH**

- A novel paramyxovirus
- 1st recognized in 1998-999 in Malaysia.
- "Sungai Nipah" in Malaysia where the first human cases lived.
- Pig – orchards (fruit bats) – dropping contained virus.
- Virus aerosolization caused infection in pigs with overcrowding leading to explosive transmission rates to pigs handlers. "Fire sale"
Severe Acute Respiratory Syndrome (SARS)

No. of probable cases (1/11/2002 – 31/07/2003), = 8,097 cases, Deaths = 774 in 29 countries

Estimation of the impact of SARS on economies, 2003

<table>
<thead>
<tr>
<th>Country</th>
<th>%GDP</th>
<th>Reduction of GDP (USD billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hong Kong</td>
<td>6.6%</td>
<td>6.6%</td>
</tr>
<tr>
<td>China, mainland</td>
<td>5.8%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Taiwan</td>
<td>5.3%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Korea</td>
<td>0.5%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Singapore</td>
<td>2.3%</td>
<td>2.3%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1.4%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Thailand</td>
<td>1.6%</td>
<td>1.6%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1.3%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Philippines</td>
<td>0.8%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>
Highly Pathogenic - Avian Influenza H5N1

- The H5N1 virus subtype - a highly pathogenic AI virus - first infected humans in 1997 during a poultry outbreak in Hong Kong SAR, China.
- In August 2004, HPAI virus was isolated in the state of Kelantan, Malaysia.
- These viruses have been characterized and found to belong to genotype Z i.e. similar to the most recent H5N1 isolates of Thailand and Vietnam.
EMERGING ZOONOSES – EXAMPLES OF RECENT OUTBREAK

H5N1

- Most human cases - contact with sick or dead poultry that were infected with H5N1 viruses.
- About 60% of people infected with the virus died from their illness.

- In 2011, 62 human cases and 34 deaths - 5 countries (Bangladesh, Cambodia, China, Egypt, and Indonesia).
- 6 countries—Bangladesh, China, Egypt, India, Indonesia, and Vietnam—have widespread and ongoing infections in their poultry.

“200 million birds died/culled in 49 countries” (WHO)
Pandemic Influenza A H1N1

- March 2009: 1st cases of new type of “swine flu” in USA. Genetic analysis suggests it may have started circulating in human in January

- April 2009: an outbreak of influenza-like illness in Veracruz, Mexico reported to WHO

- May 2009: Malaysia’s first laboratory confirmed case (imported case)

- June 2009: WHO declares pandemic alert level phase 6

- June 2009: Malaysia’s first local transmission case reported
EMERGING ZOONOSES – EXAMPLES OF RECENT OUTBREAK

Pandemic H1N1 2009

• 12 April 2009: an outbreak of influenza-like illness in Veracruz, Mexico reported to WHO
• 15 May 2009: Malaysia’s first laboratory confirmed case (imported case)
• 11 June 2009: WHO declares pandemic alert level phase 6
• 21 June 2009: Malaysia’s first local transmission case reported
EMERGING ZOONOSES – EXAMPLES OF RECENT OUTBREAK

Pandemic Responses

Implementing Rapid Containment measures

Measures to sustain the essential social function

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Avian Influenza A(H7N9) Virus

• An outbreak of human infections with a new avian influenza A (H7N9) virus was first reported in China by the World Health Organization on April 1, 2013. (Cases of avian influenza A(H7N9) were first identified in China involving three urban residents of Shanghai & Anhui – March 2013)
• The virus was detected in poultry in China as well.

• Many of the people infected with H7N9 reported contact with poultry or contaminated environment i.e. live animal market.

• To date, WHO has been informed of a total of 631 laboratory-confirmed human cases with avian influenza A(H7N9) virus including 204 deaths.
Novel Avian Influenza A(H7N9)

The eight genes of the H7N9 virus are closely related to avian influenza viruses found in domestic ducks, wild birds and bramblings in Asia. The virus likely emerged from “reassortment”, a process in which two or more influenza viruses co-infect a single host cell and exchange genes. This can result in the creation of a new influenza virus. Expert thinks multiple reassortment events led to the creation of the H7N9 virus. These events may have occurred in habitats shared by wild and domestic birds and/or in live bird/poultry market, where different species of birds are bought and sold for food. As the above diagram shows, the H7N9 virus likely obtained its HA (hemagglutinin) gene from domestic ducks (H7N3), its NA (neuraminidase) gene from wild birds (H7N9), and its six remaining genes from multiple related H9N2 influenza viruses in bramblings.
Figure 1: Laboratory-Confirmed Cases of Human Infection with Avian Influenza A(H7N9) Virus by Week of Onset (23rd February 2015)
FIRST LABORATORY-CONFIRMED CASE OF AVIAN INFLUENZA A(H7N9) IN MALAYSIA (FEBRUARY 2014)

- **11 FEBRUARY 2014**: Malaysia confirmed and reported the first case of avian influenza A(H7N9) outside China
  - Imported case involving 67 year old female Chinese tourist who had travelled from Guangdong, China to Kuala Lumpur then to Sabah, Malaysia
  - Was previously treated by a GP for symptoms of fever, cough, fatigue and joint pain in China on 30 January 2014
  - On 7 February 2014, her condition progressively worsen and admitted to district hospital in Sabah then refer to private specialist hospital (specimens was sent to PHL KK & IMR)

- **Laboratory diagnosis;**
  i. 7 Feb. 2014 – PCR - Throat swab positive for influenza A
  iii. 11 Feb 2014 – the second sample were tested positive for avian influenza A(H7N9)
  iv. Patient discharge well............
Sequencing and alignment of the HA and NA genes produced a length of **1664 and 1321 bp** respectively and the virus was named as Influenza [**A Virus (A/Malaysia/228/2014(H7N9))**](#). The phylogram showed clustered the influenza A Virus (A/Malaysia/228/2014(H7N9)) segment **4 haemagglutinin (HA)** gene into the group of Guangzhou strains whereas the Influenza A Virus (A/Malaysia/228/2014(H7N9)) segment **6 neuraminidase (NA)** gene was clustered into the group of Guangdong strains. The HA mutations found in this study were mostly involved in viral oligomerization and NA mutations were mainly involved in small ligand binding. **None** of the neuraminidase inhibitor resistant mutations were found in these strains.
EMERGING ZOONOSES – EXAMPLES OF RECENT OUTBREAK

MERS CoV

- Caused by a coronavirus called Middle East Respiratory Syndrome Coronavirus (MERS-CoV).
- Most MERS patients developed severe acute respiratory illness with symptoms of fever, cough and shortness of breath.
- About 3-4 out of every 10 patients reported with MERS have died.
- Health officials first reported the disease in Saudi Arabia in September 2012. Through retrospective investigations, health officials later identified that the first known cases of MERS occurred in Jordan in April 2012.
- So far, all cases of MERS have been linked to countries in and near the Arabian Peninsula.
- MERS-CoV has been found in some camels, and some MERS patients have reported contact with camels. However, we do not know exactly how people become infected with MERS-CoV—many people with MERS have had close contact with a person sick with MERS.
- MERS-CoV has spread from ill people to others through close contact, such as caring for or living with an infected person. However, there is no evidence of sustained spreading in community settings.
- Globally until 4 April 2015, 1102 laboratoryConfirmed cases of infection with CoV including at least 416 related deaths have been reported to WHO.
EMERGING ZOONOSES – EXAMPLES OF RECENT OUTBREAK

EBOLA - EVD

• Ebola virus disease (EVD) is a severe illness caused by infection with a virus of the family Filoviridae, genus Ebolavirus. There are five identified subspecies of Ebolavirus, of which four cause disease in humans. These subspecies are the Ebola virus (Zaire ebolavirus; EBOV), Sudan virus (Sudan ebolavirus; SUDV), Taï Forest virus (Taï Forest ebolavirus; TAFV) and Bundibugyo virus (Bundibugyo ebolavirus; BDBV). The Reston virus (Reston ebolavirus; RESTV) has caused disease in non-human primates, but not in humans.

• First emerged in 1986 among cattle – UK

There have been a total of 25,178 reported confirmed, probable, and suspected cases of EVD in Guinea, Liberia and Sierra Leone (figure 1), with over 10,000 reported deaths (outcomes for many cases are unknown).

![Figure 1: Confirmed, probable, and suspected EVD cases worldwide (data up to 29 March 2015)](image)
Emerging Infectious Diseases

- Translocation
- Encroachment
- Introduction
- "Spill over" & "Spill back"

- Human encroachment
- Ecological manipulation
- Global travel
- Urbanization
- Biomedical manipulation

Wildlife

Environment

Domestic Animal

Human

Agricultural Intensification

Technology and Industry

Dasazak P. et.al. Science 2000 287:443
Factors Influencing Frequency & Pattern of Zoonoses

- Nature & extent of human-animal contact
- Socioeconomic condition
- Religious beliefs & cultural influences
- Climate & environmental disaster
- Animal & human population movements
- Animal management
Factors Influencing Zoonoses Transmission

- Sharing home environment with livestock
- Movement of animal population
- Limited human & veterinary health services
- Poor sanitation & hygiene
- Environmental disaster (flood / earthquake)
- AIDS epidemic / immunosuppression
- Civil unrest / wars
Factors Influencing Zoonoses Transmission

- Leisure time activities (hunting / camping)
- Ownership of pets
- Poor personal hygiene
- Suburban development intruding animal population
- Intensive animal production
- Centralised food processing
PREPAREDNESS AND RESPONSE
International Health Regulations 2005 (IHR 2005)

- A global legal framework for global public health security
- Represents the joint commitment for shared responsibilities and collective defenses against disease spread
- Legally binding for the world’s countries and WHO that have agreed to play by the same rules to secure international health
- The successful implementation of the IHR requires a strong national public health system, that is critical for response to a public health emergency of international concern (PHEIC)
**International Health Regulation (2005):**
Called upon Member States and WHO to strengthen their capacities to detect, report and respond to acute public health events – in order to build a global public health defense system

**The Asia Pacific Strategy for Emerging Diseases (APSED):**
Serves as a road map to guide all countries in the region in building the IHR (2005) core capacity requirements, thus ensuring regional and global health security
Regional Action for Health Security

- The Asia Pacific region has been an epicenter for emerging diseases, resulting in significant impact on health, social and economic development.

- The Asia Pacific Strategy for Emerging Diseases (APSED) has been developed and implemented to confront health security threats arising from emerging diseases, including zoonoses
  - APSED was originally developed in 2005 and endorsed by the Member States of two WHO regions (i.e. WPRO & SEARO)
  - APSED has served as common strategic framework for countries, WHO, donors and partners to work towards collectively for regional security
<table>
<thead>
<tr>
<th>Focus area</th>
<th>Key components</th>
</tr>
</thead>
</table>
| 1. Surveillance, risk assessment and response | ▪ Event-based surveillance  
▪ Indicator-based surveillance  
▪ Risk assessment capacity  
▪ Rapid response capacity  
▪ Field epidemiology training |
| 2. Laboratories                                | ▪ Accurate laboratory diagnosis  
▪ Laboratory support for surveillance and response  
▪ Coordination and laboratory networking  
▪ Biosafety |
| 3. Zoonoses                                    | ▪ Coordination mechanism for:  
  ○ sharing of surveillance information  
  ○ coordinated response  
  ○ risk reduction  
  ○ research |
| 4. Infection prevention and control            | ▪ National infection prevention and control (IPC) structure  
▪ IPC policy and technical guidelines  
▪ Enabling environment (e.g. facilities, equipment and supplies)  
▪ Supporting compliance with IPC practices |
| 5. Risk communications                         | ▪ Health emergency communications  
▪ Operation communications  
▪ Behaviour change communications |
| 6. Public health emergency preparedness        | ▪ Public health emergency planning  
▪ National IHR Focal Point functions  
▪ Points-of-entry preparedness  
▪ Response logistics  
▪ Clinical case management  
▪ Health care facility preparedness and response |
| 7. Regional preparedness, alert and response   | ▪ Regional surveillance and risk assessment  
▪ Regional information-sharing system  
▪ Regional preparedness and response |
| 8. Monitoring and evaluation                   | ▪ Country-level monitoring (including workplan and APSED/IHR indicators)  
▪ Regional-level monitoring: Technical Advisory Group  
▪ Evaluation |
Malaysia: The Way Forward

• The preparedness plans:
  – 2006: The National Crisis and Preparedness Response Centre (CPRC)
  – 2008: The Risk Communication Work Plan

• The National Influenza Pandemic Preparedness Plan (NIPPP):
  – Preparation started in 2003
  – Drafted by the National Influenza Pandemic Planning (Technical) Committee (NIPPC) and later endorsed by the Cabinet
  – Launched on 9 January 2006
Malaysia: Key Components of the Preparedness

• **Capacity building:**
  – Surveillance system
  – Establishment of Rapid Response Team / Rapid Assessment Team (RRT/RAT)
  – Epidemic Intelligence Programme (EIP)
  – Protocol
  – Simulation exercises

• **Infrastructure development:**
  – Medical services facilities
  – Laboratory support
  – Point of Entry (PoE)

• **Stockpiling**
Surveillance Systems in Malaysia

- Laboratory-Based Surveillance
  - Microbiology Laboratories
    - Public/Private

- Mandatory notification
  - Diseases surveillance
    - (Notification Disease)
  - PUBLIC: Health Centres
    - Hospitals
  - PRIVATE: GP Clinics Hospitals

- Clinical-Based surveillance
  - Sentinel (selected clinics)
  - National (hospitals)
  - Syndromic (A&E/wards/clinics)

- Community based surveillance
  - Community/ Media/ International sources

- Other Agencies
  - Dept of Veterinary Services
    - (Zoonotic Disease)

- Notification of micro-organisms

- District Health Office

- State Health Department

- National: Disease Control Division, MOH

- IMR/PHL

- Results
Alert, Enhanced Surveillance and Management of Avian Influenza in Human

Coordinated by:
Communicable Disease Surveillance Section,
Disease Control Division
MINISTRY OF HEALTH MALAYSIA
September 2004

Protocols & Algorithm

Management for Adult Patient Under Investigation (PUI) with Influenza-like Illness (ILI) in Outpatient Setting

PUI Presenting with ILI Symptoms within 48 hours of onset of illness

Assessment by Doctor
Does patient have any symptoms and signs of moderate or severe illness (Clinical assessment tool*)

Yes

Mild Illness

No

Notify Take throat swab (Annex 3)

Moderate or Severe Illness
Admit to nearest hospital for screening and treatment
Receiving hospital to send sample for laboratory diagnosis and notify (Annex 3)

No

Co-morbidities** Does patient have a co-morbidity associated with increased risk of influenza

Yes

NO

TREATMENT
Start oseltamivir as standard doses for 5 days & continue home care with Home Assessment Tool*** monitoring
(Zanamivir is not advisable in patients with history of bronchospasm)

Does patient have fever ≥38°C after 48 hours from onset of illness and/or are symptoms rapidly progressive even within first 2 days?

Yes

No

Response to Treatment
Has condition improved?

Yes

Condition Improved
To complete course of antivirals at home

Develops Moderate or Severe Illness
Patient to seek medical reassessment Referral to hospital

No

Allow to go home and continue home care with Home Assessment Tool monitoring
Virological Influenza Surveillance in Malaysia (2003-2014)
Circulating Influenza Strains Malaysia 2003-2014

Source: Institute of Medical Research (IMR), MOH Malaysia

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Brucellosis

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

1st EDITION

DISEASE CONTROL DIVISION
DEPARTMENT OF PUBLIC HEALTH
MINISTRY OF HEALTH MALAYSIA
2012

Dr Khebir M.D.
National Public Health Laboratory,
Ministry of Health Malaysia

Workshop on One Health
5TH October – HATTEN Hotel, Melaka
Avian Influenza Field Simulation Exercise

Dr Khebir M.D.
National Public Health Laboratory,
Ministry of Health Malaysia

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Ebola

Ebola is a rare and deadly disease caused by infection with an Ebola virus.

How Ebola Germs are Spread

Ebola can only be spread by direct contact with blood or body fluids from:
- A person who is sick or who has died of Ebola.
- Objects like needles that have been in contact with the blood or body fluids of a person sick with Ebola.
- Ebola cannot spread in the air or by water or food.

Who Gets Ebola?

People most at risk of getting Ebola are:
- Healthcare providers taking care of Ebola patients.
- Friends and family who have had unprotected direct contact with blood or body fluids of a person sick with Ebola.

Signs and Symptoms of Ebola

The signs and symptoms of Ebola can appear 2 to 21 days after exposure. The average time is 8 to 10 days. Symptoms of Ebola develop over several days and become progressively more severe:
- People with Ebola cannot spread the virus until symptoms appear.

EBOLA BASICS

When is someone able to spread the disease to others?

Ebola only spreads when people are sick. A patient must have symptoms to spread the disease to others.

After 21 days, if an exposed person does not develop symptoms, they will not become sick with Ebola.

cdc.gov/ebola

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FLOW CHART: JOINT ALERT AND COMMUNICATION SYSTEM FOR AVIAN INFLUENZA

MINISTRY OF HEALTH

Surveillance Operation Room
(Disease Control Division, Ministry of Health
03-88810200, 03-88810300)

STATE LEVEL

State Health Department and
District Health Office
(Alert and Put On Standby)

DISTRICT LEVEL

Activate
Rapid Response Team
(Refer to Alert, Enhanced
Surveillance and Management of Avian
Influenza in Human)

Note:
- Positive HPAI detected
- Negative HPAI detected
- Investigation Report

DEPARTMENT OF VETERINARY SERVICES

Surveillance Team
(Dept. Of Veterinary Services)

Farmer Notification

Mortality > 3% (Poultry)

Steering Committee
Inter Agencies Committee
Cabinet Committee

Rapid Action Team (RAT)
(Dept. Of Veterinary Services)

Alert Management Team
(Disease Control Unit, Dept. Of Veterinary Services
03-88702041, 03-88702042)

State Veterinary Services

Gazet and Notify Farm

Field Operation
Culling and Carcasses Disposal
Biosecurity & Decontamination
Compensation
Movement Control
Enforcement
**Good Practices in Medicine**

**In the Era of Infectious Disease: History of Exposure is very important**

- Exposure is about
  - **geography** (location) - Where you live, where you work (+ part time & hobby), where you eat, where you play & where you travel?
  - **timing** (when) – related to incubation period, recent event and
  - **practices** (what was done) - slaughtering/contact with animals, swimming, white water rafting, drinking raw water.

- Zoonotic Diseases diseases have reinforced these standard questions in clinical history taking.
ZOOONOSIS: Exposure History

For zoonotic infection apart from clinical presentation (most have nonspecific presentation, mimic a number of conditions, it is most often misdiagnosed), EXPOSURE HISTORY IS VERY IMPORTANT:

- **Animal contact** eg. Avian Influenza, toxoplasmosis, rabies
- **Place of stay** eg. P. knowlesi malaria, Leptospirosis, Nipah
- **Work & including part time or hobby**
  - eg. Leptospirosis, Q Fever, Cryptosporidoisis
- **Leisure activity** eg. Leptospirosis
- **Travel & recent event (i.e flooding)** eg Avian influenza, MERS-CoV, Leptospirosis
- **Food consumption (animal origin including milk) & water usage** eg. Sarcocytosis, Brucellosis
Prevention & Control of Zoonoses

- **Control of infection source**
  - reduce certain animal reservoir population
  - separation of animal from human habitations – fences, screens
  - immunisation for animal
  - removal of rubbish, keeping human habitation clean
  - do not leave food around recreational areas
  - treat infected animal
Prevention & Control of Zoonoses

- **Interruption of transmission**
  - human vaccination
  - avoiding contact with infected animals
  - use of protective equipments
  - meat & milk hygiene
  - vector control
  - restriction / control animal movement
Prevention & Control of Zoonoses

- **Human protection**
  - human vaccination
  - avoiding contact with infected animals
  - use of protective equipments
  - awareness on the zoonotic diseases
  - chemoprophylaxis
Prevention & Control of Zoonoses

- **Communication, education**
  - education to medical & health staff
  - training of high risk population
Prevention & Control of Zoonoses

- **Detection, surveillance**
  - cases should be detected – awareness/training on diseases
  - notifiable diseases, laboratory-based surveillance, syndromic surveillance
  - outbreak investigation
Challenges

- Preparedness
- Early & accurate surveillance
- Rapid response
- Prevention and control measures
- Early identification of pathogen
- Multi-sectoral cooperation — “One Health Approach”
- Political commitment to invest of the uncertainty
- International trend
  Cross-border and cross continent issues
Conclusion

• Surveillance, early detection and rapid response are the keys to reducing the risks from emerging diseases.

• Way forward through the scope of IHR (2005) with the One Health approach of collaboration and continued core capacity building.

• Strong political commitment and well-trained and committed health workers crucial.
TERIMA KASIH
(Thank You)