

**Rapid Containment:  
Pharmaceutical Measures  
(Phase 4 & 5)**

# Goal of Rapid Containment

“To ensure rapid detection and investigation of clusters of cases, closely related in time and place, and ensure immediate national/international intervention aimed at preventing the emergence of a fully transmissible pandemic virus or delaying its international spread.”

Source: WHO strategic action plan for pandemic influenza 2006-2007

# Modeling Studies:

## Possible to Contain Emerging Virus Stain in South-East Asia

- ❑ Antivirals would need to reach a sizeable proportion of affected persons (80%-90%)
- ❑ Accompanied by rapid and effective implementation of non-pharmaceutical measures (i.e. quarantine movement restriction)
- ❑ Over a very short period of time (days to 3 weeks)

# Containment Strategy:

## Key Assumptions

- ❑ Virus will not be highly transmissible
- ❑ Emergence will be geographically circumscribed
- ❑ Initial clusters will be rapidly detected and reported
- ❑ Antivirals will be rapidly mobilised and administered
- ❑ Population movement will be restricted

# Critical Actions for Rapid Containment

- ❑ Signal detection
- ❑ Initial investigation and control measures
- ❑ Notification and assessment
- ❑ Containment decision and strategy
- ❑ Implementation of containment measures
- ❑ Monitoring and evaluation

# Influenza Public Health Interventions

- Pharmaceutical interventions
  - Vaccines
  - Antivirals
- Non-pharmaceutical public health measures
  - Case or cohort isolation
  - Voluntary quarantine
  - Social distancing - school closure
  - Hand hygiene, cough etiquette
  - Respiratory protection (mask use)

# Major Activities – Rapid Containment

## Antiviral Prophylaxis

### Chemoprophylaxis of target groups based on risk assessment:

- To protect identified contacts
- To break chain of transmission

#### 1. **Layered approach** - prophylaxis of exposed contacts

Family members, close (face-to-face-) contacts at school, workplace, etc. (e.g., socially targeted)

#### 2. **Ring prophylaxis** - to cover a specific geographic area

Prophylaxis of whole population in the containment zone

# Major Activities – Rapid Containment

## Antiviral Prophylaxis

- **Index Cluster**
  - Contacts of Cases
  
- **Containment Zone**
  - All persons in the zone
  
- **Buffer Zone**
  - Contacts of Cases

# Oseltamivir Overview

- ❑ **Effective for treatment and prophylaxis**
  - Early treatment reduces complications, antibiotic use, hospitalisations
- ❑ **Antiviral for pandemic containment of choiced**
  - WHO and countries have rapid response stockpile of oseltamivir
- ❑ **Excellent oral absorption**
  - Long plasma half-life → infrequent dosing
- ❑ **Antiviral resistance may occur**
  - Treatment failure in H5N1 observed

# Oseltamivir Oral Formulations

- Capsules 75 mg each
- 10 capsules per box
- Store at room temperature (15 - 30°C)



## Liquid Suspension

(for pediatric use)

- White powder mixed with 23 ml of drinking water
- Fruit flavored
- Refrigeration required
- Use within 10 days
- Oral dispenser included

# Oseltamivir Doses\*

Patient Age	Dose
$\geq 13$ years	1 capsule (75 mg)
1 to 12 years	<ul style="list-style-type: none"><li>❑ <math>&lt; 15</math> kg: 30 mg</li><li>❑ 15-<math>&lt;23</math> kg: 45 mg</li><li>❑ 23-<math>&lt;40</math> kg: 60 mg</li><li>❑ <math>\geq 40</math> kg: 75 mg</li></ul>

\*Duration of prophylaxis depends on epidemiologic setting. Post-exposure use is typically for 7 to 10 days after last day of exposure.

Prophylaxis: Once a day, Treatment: twice a day

# Common Oseltamivir Side Effects

## □ Likely related to oseltamivir

- Nausea (10-15%), vomiting (9%)

## □ Likely related to underlying illness

- Headache (20%)\*, fatigue (8%)\*, diarrhea (7%), cough (6%)\*
- Bronchitis, abdominal pain, dizziness (2%)
- Insomnia, vertigo (1%)

# Oseltamivir Reactions

## Serious Adverse Events\*

Allergic reactions

Skin rash (sometimes severe)

Facial swelling

Neuro-psychiatric reactions

Hepatitis

**\*A causal relationship has not been established for most of these**

# Contraindications and Precautions

- ❑ **Pregnant women or breastfeeding mothers**
  - No recognized birth defects in pre-clinical testing
  - No human clinical studies demonstrating safety or efficacy
  - Use if benefit outweighs risk
- ❑ **Infants (< 1 year of age)**
- ❑ **Kidney disease**
  - Decrease dose based on creatinine clearance

# Contraindications and Precautions

## Contraindications and Precautions - H1N1

### Outbreaks

Severe illness among pregnant women and infants have been reported in outbreak of H1N1 pandemic. CDC and FDA have therefore authorised the use of oseltamivir for use in pregnant women and children under the Emergency Use Authorization (EUA)\*

\*Refer: [http://www.cdc.gov/h1n1flu/clinician\\_pregnant.htm](http://www.cdc.gov/h1n1flu/clinician_pregnant.htm)

[http://cdc.gov/h1n1flu/clinician\\_childrentreatment.htm](http://cdc.gov/h1n1flu/clinician_childrentreatment.htm).

# Role of Vaccines in Rapid Containment

- ❑ Non-existent, stockpiling not possible

or

- ❑ Poorly matched pre-pandemic vaccine in small amount
  - 2-4 weeks after inoculation
  - Second dose required
  - Uncertain efficacy/effectiveness
- ❑ Pandemic vaccine
  - 6 months until vaccine production
  - little surge capacity



**Thank you**