Influenza and Current Pandemic :
School Children / Parents' Perspectives

Dr B V Tandale (MD)
Scientist D
Epidemiologist
NIV Pune
Email: tandale.bv@niv.co.in

When does the pandemic start?

- Usually not known
- H5N1 is not the only avian influenza A virus to worry about
- Circulation of H5N1 viruses among poultry must be controlled
- WHO Pandemic alert period:

  Phase 3 (Avian H5N1 influenza)

  Phase 6 (Novel H1N1 influenza)

Pre-requisites for an Influenza Pandemic

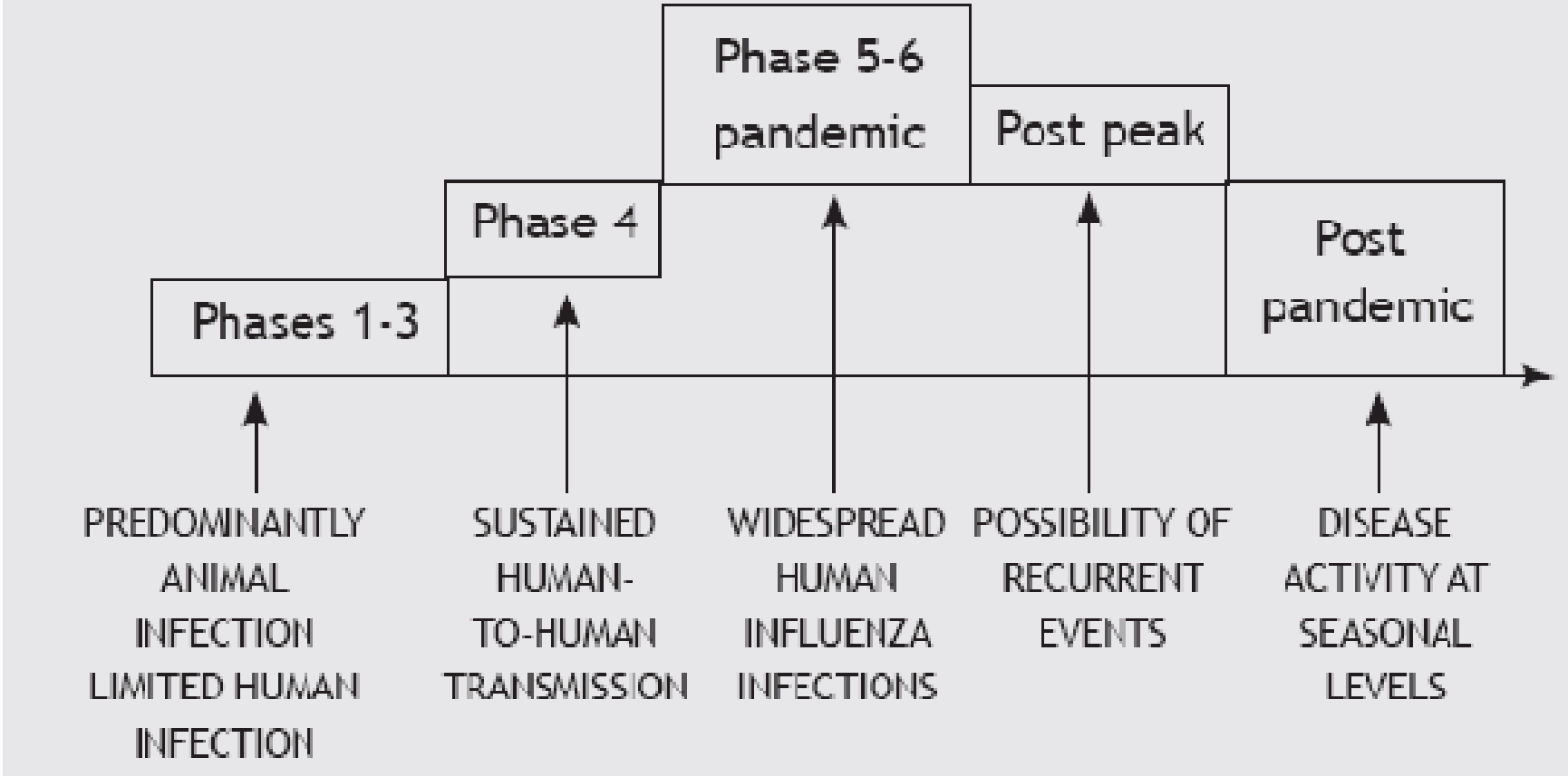
(i) Emergence of a novel virus to which all humans are susceptible

(ii) New virus is able to replicate and cause diseases in humans

(iii) New virus is transmitted efficiently from human-to-human

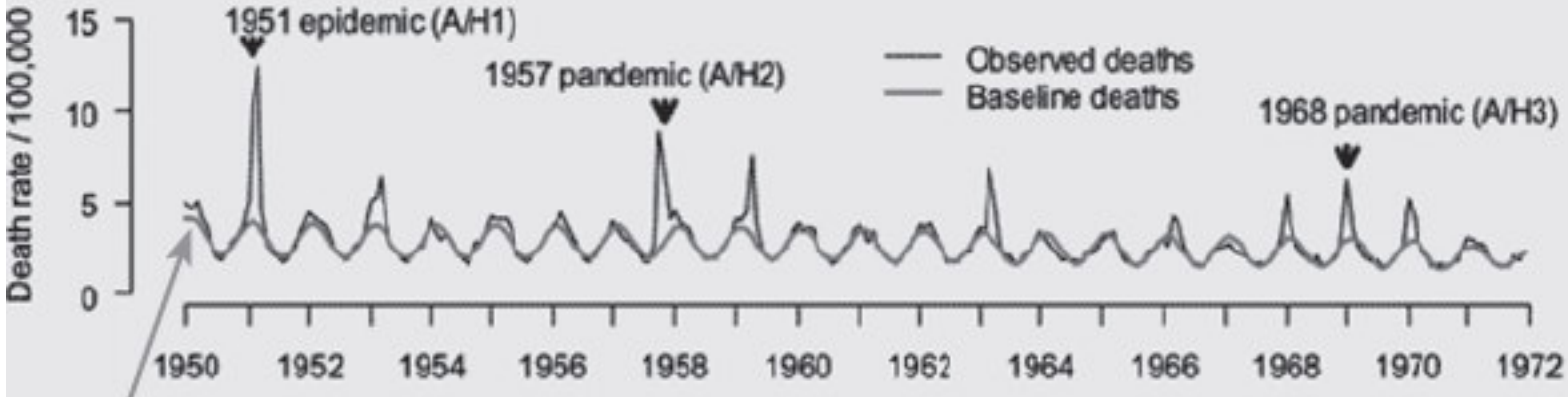
All Criteria Met for the Novel Influenza A H1N1

WHO Phasing of Pandemic Influenza



Epidemiology Terms

- Endemic
  - A disease that occurs at an expected constant level in a population
  - "Background" level

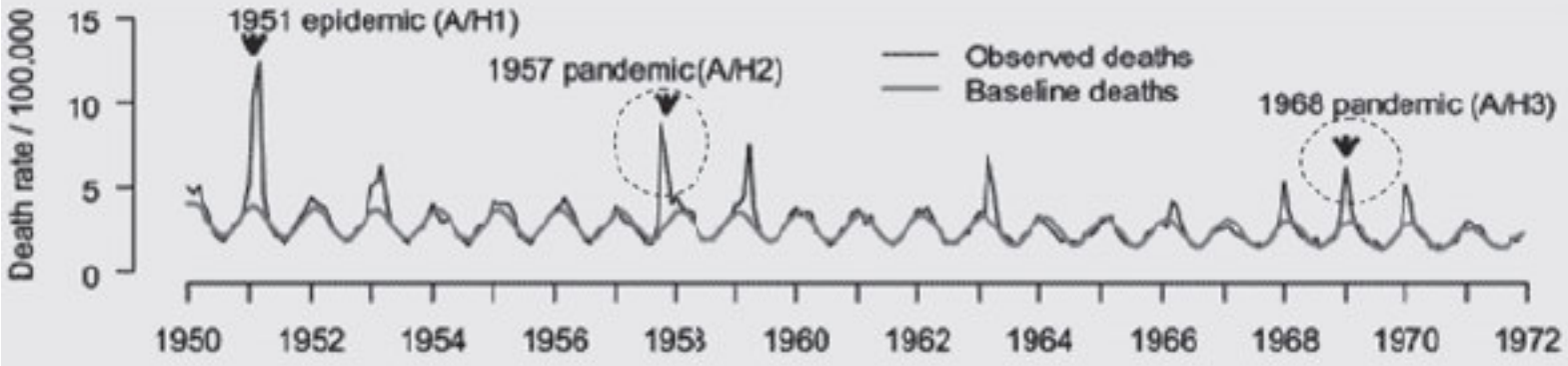


Gray line: Expected deaths each year

Cécile Viboud, et al. Emerg Infect Dis. 2006 Apr. Available from http://www.cdc.gov/ncidod/EID/vol12no04/05-0695-G2.htm

Epidemiology Terms

- Epidemic
  - When the cases of a disease exceed what is normally expected
- Pandemic
  - An epidemic that occurs over a large geographic area, or across the whole world



Pandemic Influenza

A worldwide surge in cases caused by the introduction of a new influenza type A surface protein (antigenic shift)

A pandemic is a ***global*** disease outbreak.

Seasonal Epidemics vs. Pandemics

Seasonal Influenza	Influenza Pandemics
A public health problem each year	Appears in the human population rarely and unpredictably
Usually some immunity built up from previous exposures to the same subtype	Human population lacks any immunity. Virulence and mortality not entirely linked to immunity
Infants and elderly most at risk	All age groups, including healthy young adults, may be at increased risk for serious complications
Result of Antigenic Drift	Result of Antigenic Shift

Influenza: Key Characteristics—Environmental Factors

Seasonality

- Temperate zones: epidemics occur in winter
- Tropics: epidemics occur in rainy season
- Sporadic cases: any month

Overcrowding

- Enhances transmission
- Higher attack rates in closed population groups (schools, institutions, ships etc.)

Influenza: Key Characteristics—Disease Transmission

Mainly airborne

- Droplet infection
- Droplet nuclei

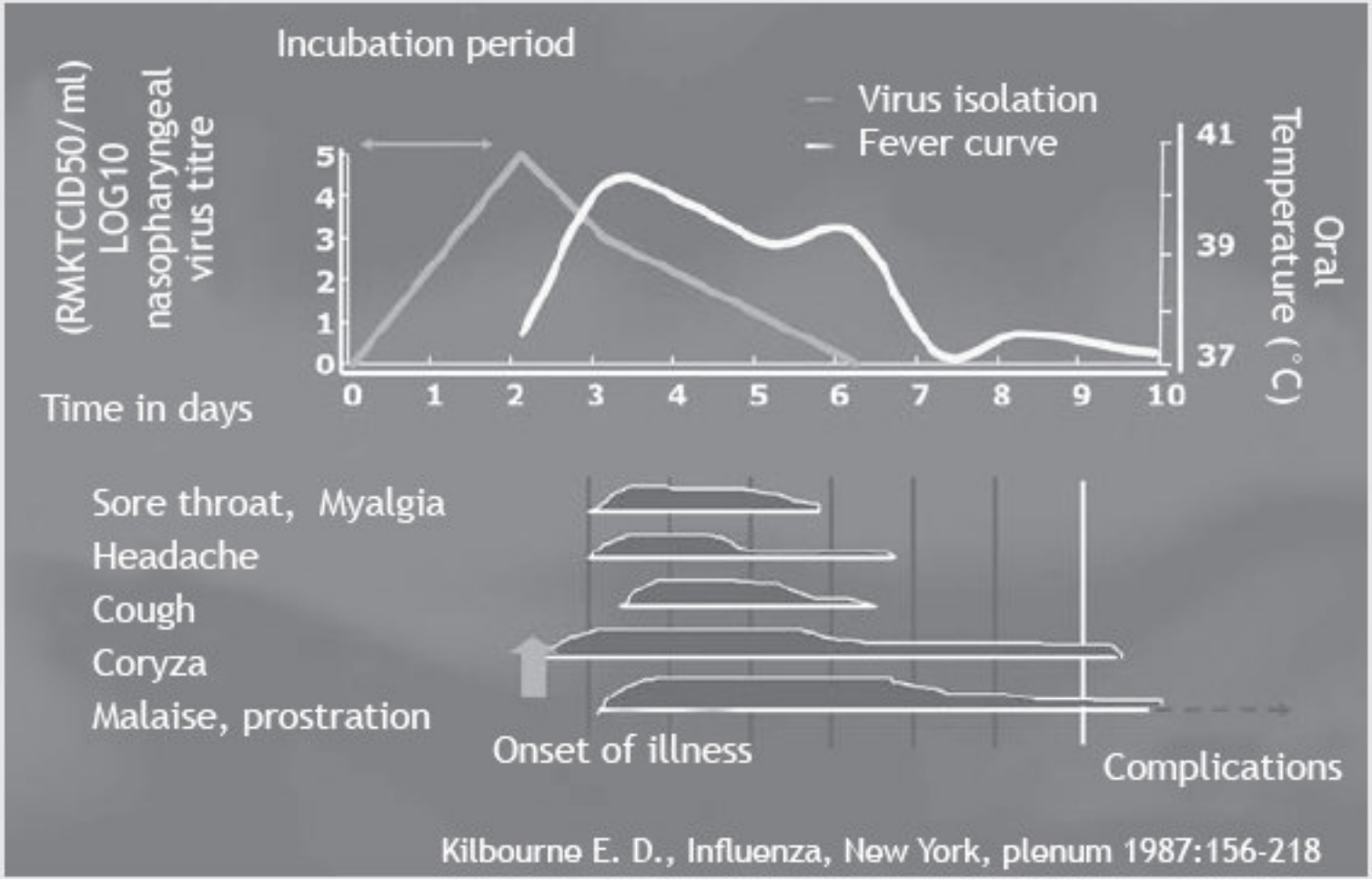
Through direct contact

Transmission from objects possible

Incubation period:

- 18 to 72 hours

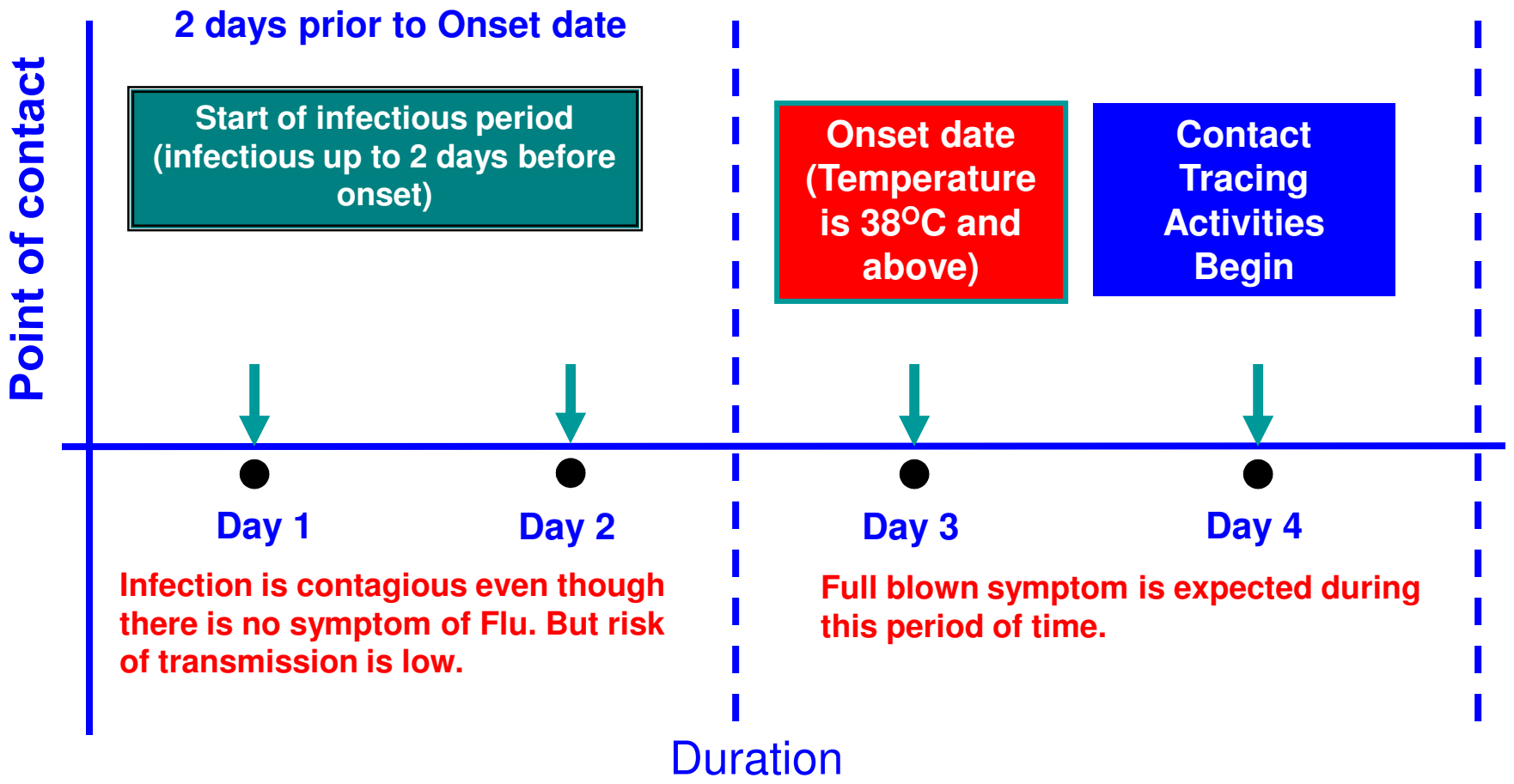
Classical Influenza



Kilbourne E. D., Influenza, New York, plenum 1987:156-218

Transmissibility

(Guidelines for Fever Handling Procedure)



Influenza Viral Shedding

Influenza A & B viruses are primarily shed in the upper respiratory tract of humans

- Viral shedding occurs the day before illness onset
- Peak viral shedding on day 1 of illness
- Duration
  - Adults may shed viruses for 4-6 days
  - Young children may shed for longer periods
  - Immunocompromised can shed for months

Physical Findings: Influenza vs Common Cold

Symptoms	Influenza	Cold
• Fever	Usually high, lasts 3-4 days	Unusual
• Headache	Yes	Unusual
• Fatigue/ weakness	Can last up to 2-3 weeks	Mild
• Pains, aches	Usual and often severe	Slight
• Exhaustion	Early and sometimes severe	Never
• Stuffy nose	Sometimes	Common
• Sore throat	Sometimes	Common
• Cough	Yes	Unusual
• Chest discomfort	Common, maybe severe	Mild/moderate
• Complications	Bronchitis, pneumonia; In severe cases life-threatening	Sinus congestion

Influenza like Illness (ILI)

- Sudden onset of a fever over 38°C

AND

- Cough or sore throat

AND

- An absence of other diagnoses

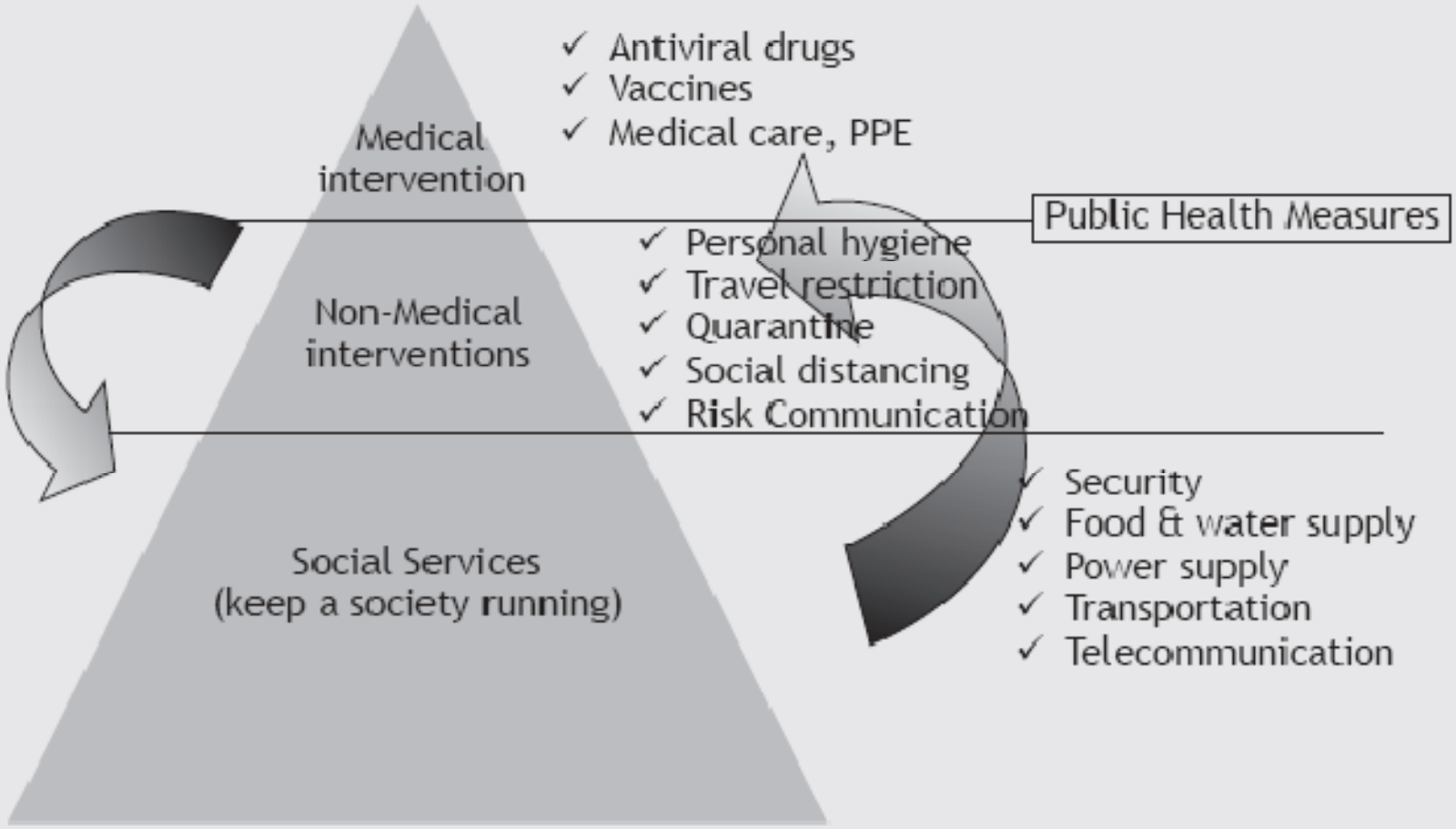
Reye's Syndrome

- Combination of liver disease and non inflammatory encephalopathy
- Associated with previous viral infections, such as influenza (more common with type B), or chickenpox
- Strong link between the administration of aspirin and Reye's syndrome

High-Risk Groups for Complications of Influenza

- Infants and young children
- Elderly
- Persons of any age with chronic conditions:
  - Chronic pulmonary or cardiovascular diseases
  - Chronic neurological diseases that impair breathing or clearance of respiratory secretions
  - Chronic metabolic diseases
  - Renal dysfunction
  - Hemoglobinopathies
  - Immunosuppressed/immunocompromised
  - Children 6 months - 18 years on chronic aspirin therapy
  - Pregnant women
  - Nursing home residents, chronic care facility residents

Pandemic Response



Adapted from Dr. T. Kasai, WHO WPRO)

- **Vaccine** – best countermeasure but will probably be unavailable during first wave of pandemic
- **Antiviral treatment** - may improve outcomes but will have only modest effects on transmission
- **Antiviral prophylaxis** – may have more substantial effects on reducing transmission
- **Non-pharmaceutical interventions** - may reduce and delay transmission, giving time to prepare

Pandemic Vaccine

- Priority groups will differ by country and depend on the goals
  - Maintain essential services
  - Reduce deaths and hospitalisations
  - Reduce morbidity
- Prioritisation can also be based on the nature of the pandemic
- Vaccine availability and population structure
- Logistics availability for distribution and administration of vaccine in the health system
- Experiences gained in mass vaccination programmes such as Pulse Polio need to be appropriately adapted and used

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 flavoured
- Refrigeration required
- Use within 10 days
- Oral dispenser included

Oseltamivir Doses*

Patient Age	Dose
> 13 years	1 capsule (75 mg)
1 to 12 years	• <15 kg: 30 mg • 15-<23 kg: 45 mg • 23-<40 kg: 60 mg • >40 kg: 75 mg

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

Note: 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.

Antiviral Prophylaxis

- Prioritisation may be necessary based on available stockpile and logistics for distribution and delivery
- Priority groups will differ by country and depend on the goals
  - Maintain essential services
  - Reduce stress on health services
  - Reduce speed of geographic spread
  - Reduce morbidity
- Antiviral availability and population structure
- Logistics availability for distribution and mass administration of drug in the health system
- Experiences gained in mass drug administration programmes such as for filariasis need to be appropriately adapted and used
- Policy resolution on whether and when the current restriction of drug availability for retailing needs to be removed

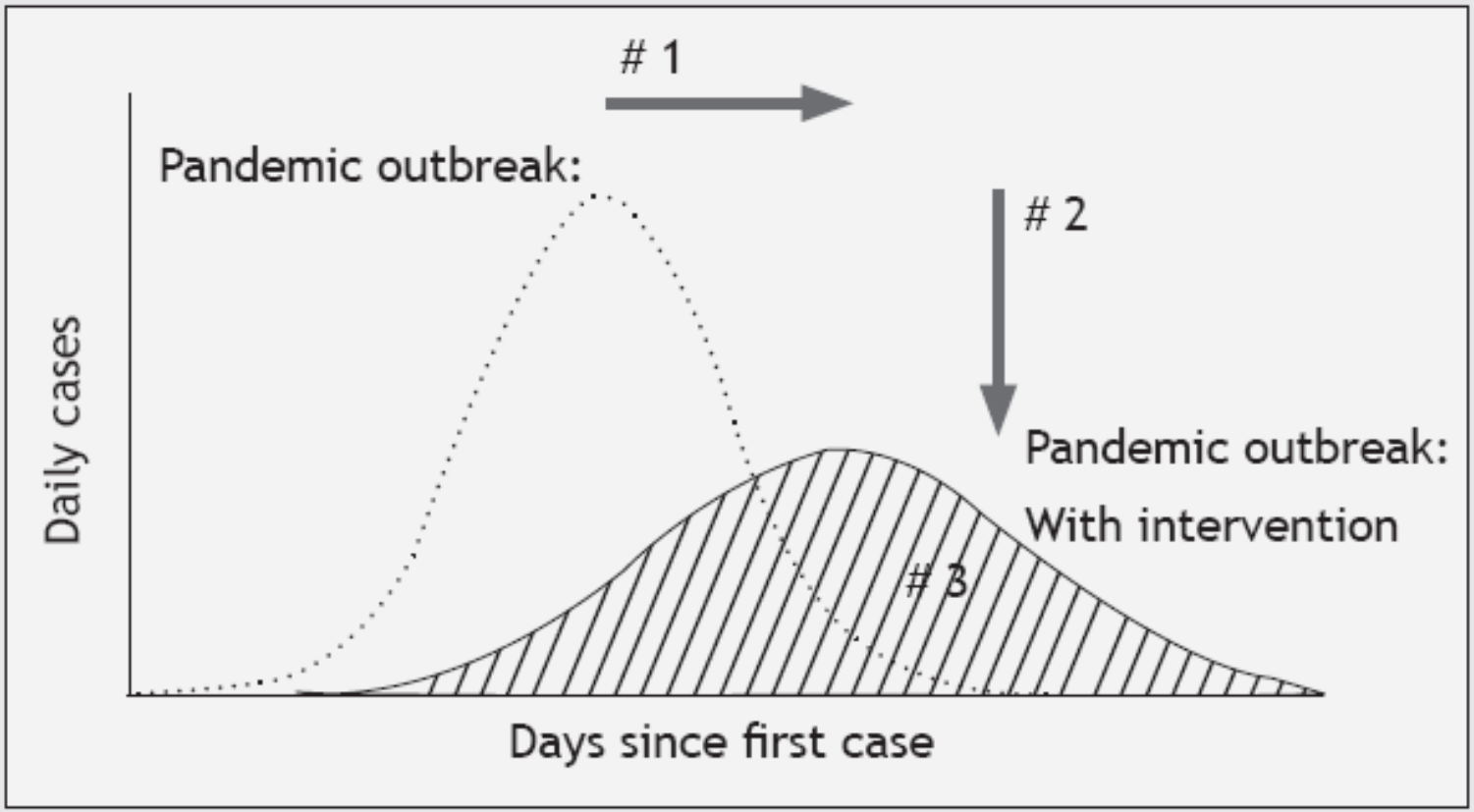
Oseltamivir Chemoprophylaxis Doses*

Patient Age	Prophylactic Dose
≥ 13 years	1 capsule (75 mg) once a day
1 to 12 years	• < 15 kg: 30 mg once a day • 15-<23 kg: 45 mg once a day • 23-<40 kg: 60 mg once a day • > 40 kg: 75 mg once a day

*Duration of prophylaxis depends on epidemiological setting (several weeks in pandemic setting). Post-exposure use is typically for 7 to 10 days.

Non-Pharmaceutical Interventions

1. Delay disease transmission and outbreak peak
2. Reduce peak burden on healthcare infrastructure
3. Diminish overall cases and health impacts



Non-Pharmaceutical Interventions

Individual Level

- Isolation
- Quarantine
- Infection control
  - Hand washing
  - Respiratory etiquettes
  - Stay away from ill persons/if ill
  - Use of Personal Protective Equipment (PPE)

Non-Pharmaceutical Interventions

Community Level

- Quarantine of groups/sites
- Community wide quarantine-*Cordon Sanitaire*
- Measures to increase social distance
  - School closures
  - Business and market closure
  - Cancellation of events
  - Movement restrictions
- Infection control measures

Non-Pharmaceutical Interventions

National/International Level

- Non-essential travel deferred
- Provide information to travelers
- Self recognition of illness and self reporting
- Entry screening
- Exit screening
- Maritime/airport quarantine
- Ban of flights/ships originating from affected area

Non-Pharmaceutical Interventions

Isolation

- Separation and restricted movement of ill persons with contagious disease
- Often in a hospital setting
- Primarily individual level
- Can be voluntary or legally mandated

Non-Pharmaceutical Interventions

Quarantine

- Refers to separation and restriction of movement or activities of persons who, while not yet ill, have been exposed to an infectious agent and therefore may become infectious
- Often at home, may be designated residential facility or hospital
- Individual or community level
- Can be voluntary or legally mandated

Non-Pharmaceutical Interventions

Community-wide Quarantine-*Cordon Sanitaire*

- Closing of community with barriers around a geographic area
- Prohibition of travel in and out of the area
- Helpful in closes settings (Military Barracks, University campuses etc.) or remote settings
- May be impractical in most settings

Non-Pharmaceutical Interventions

Closure of Schools and Facilities

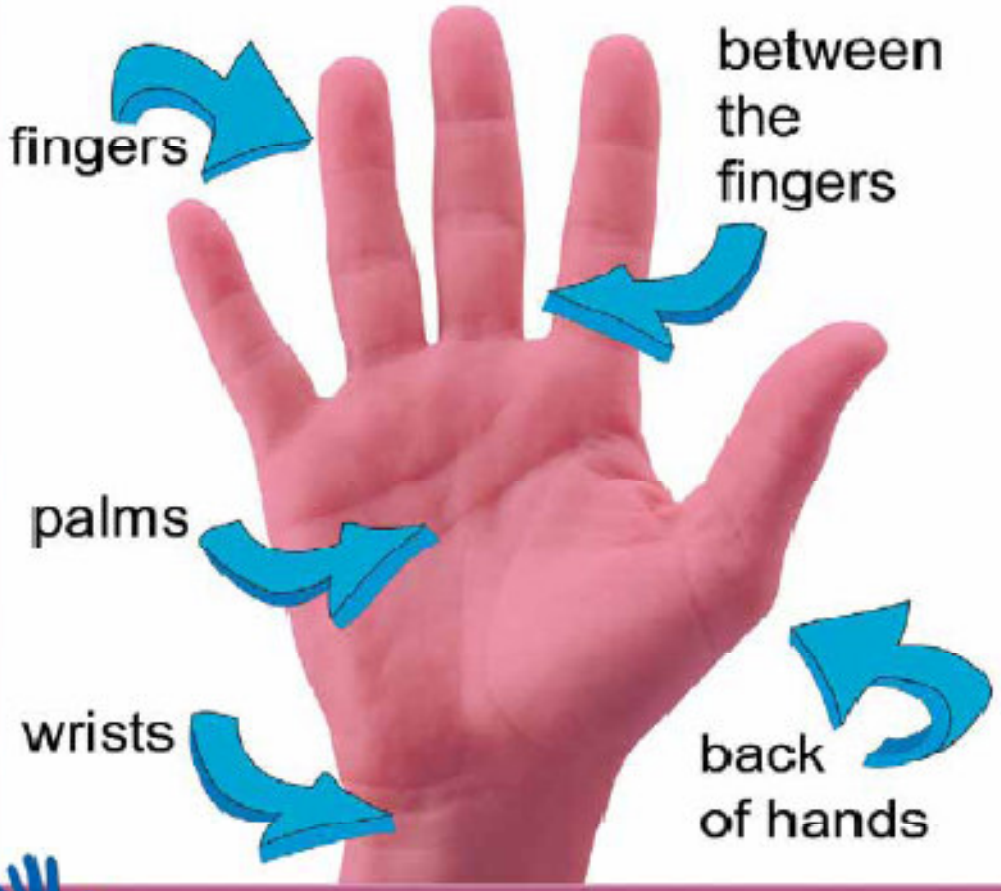
- Schools
  - Should be implemented early
  - Especially useful if high morbidity among children
- Business and market closures
  - Access to and availability of necessities
  - Economic considerations

THE FOUR FLU FIGHTERS

1. Keep your distance
2. Wash your hands
3. Cover coughs and sneezes
4. Separate the sick

WHERE TO WASH

Wash all surfaces thoroughly



Infection: Don't Pass It On

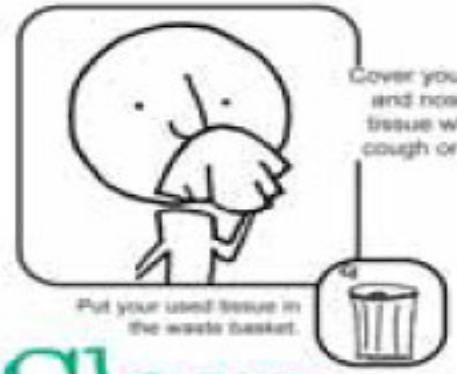
www.publichealth.va.gov/InfectionDontPassItOn

Department of Veterans Affairs

Wash 1 - All

Stop the spread of germs that make you and others sick!

Cover your Cough



Cover your mouth and nose with a tissue when you cough or sneeze

or

cough or sneeze into your upper sleeve, not your hands.

Put your used tissue in the waste basket.

Clean your Hands

after coughing or sneezing.

Wash hands with soap and warm water for 20 seconds

or

clean with alcohol-based hand cleaner.

CDC MDH APIC

HOW TO COVER YOUR COUGHS AND SNEEZES

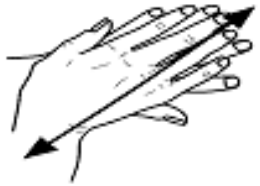
- Coughs and sneezes should be covered with a single-use tissue or a cloth that can be washed frequently, preferably immediately after use. If these are not at hand, use your upper arm sleeve—bring your elbow up to your face. You can also keep from spreading the droplets by wearing a mask if you are sick.

- Whenever possible, wash hands after coughing or sneezing.

Routine Hand Wash

Procedure 1

Wet hands and wrists. Apply soap.



Procedure 2

Right palm over left, left over right.

Procedure 3

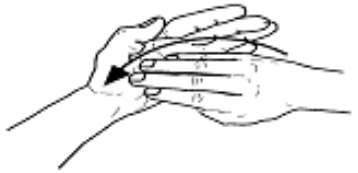
Palm to palm, fingers interlaced.

Procedure 4

Back fingers to opposing fingers interlocked.

Procedure 5

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



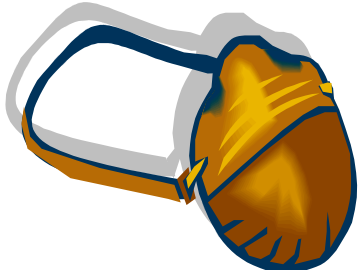
Procedure 6

Rotational rubbing backwards and forwards with tops of fingers and thumb of right hand in left and vice versa.

Taking precautions

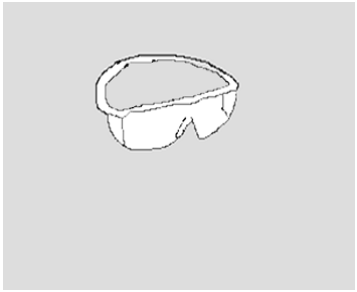
Medical Supplies

- Availability of Clinical thermometer for self monitoring.
- Temperature Monitoring devices available & calibrated.
- N95 (mouth piece)
- Clinical gloves etc etc

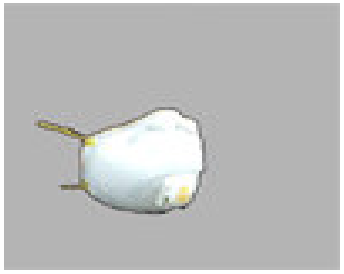


Personal Protection Equipments

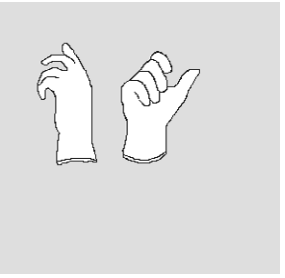
Goggles



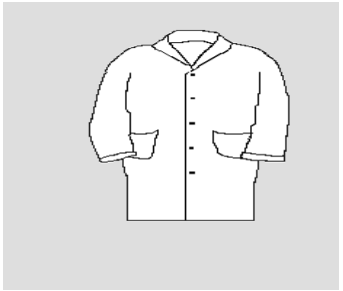
N-95 Mask



Gloves

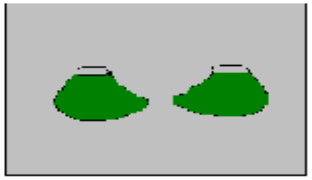


Gown (must for lab work) covers



Triple layer Mask

Shoe



How to Don a Mask

- Place over nose, mouth and chin
- Fit flexible nose piece over nose bridge
- Secure on head with ties or elastic
- Adjust to fit

Removing a Mask

- Untie the bottom, then top, tie
- Remove from face
- Discard

WHO/UNICEF recommended behaviors

To reduce transmission :

- Keep your distance from someone who is coughing and sneezing
- Stay home if you feel ill
- Cover your coughs and sneezes
- Wash your hands with soap and water

To lessen the health impact :

- Give sick people a separate space at home
- Assign a single caregiver to a sick person
- Give plenty of fluids to the sick person
- Recognize danger signs and seek prompt care

Key Issues for Schools

- Absenteeism is likely to be increased for students and staff.
  - "Normal" flu produces a 4% to 5% peak rate.
  - Experience in other countries suggests peak may be 10% to 15%.
- Infection control policies will be very important.
  - Aimed at reducing risk of school dismissals and unnecessary absenteeism
- Schools as venues for mass immunization.
  - Coordinate with local health departments

Why school children are important?

Compared to adults, children are:

- more likely to become infected
- the first group to become ill
- shed greater quantities of influenza virus and for a longer duration
- have poorer hygiene
- generally have more contact with other humans (school classrooms)

Influenza manifests differently in children & will require different treatment

- Symptoms may be more non-specific
- Gastrointestinal symptoms are more likely
- Difference between concurrent diseases difficult
- Current antivirals not approved for children <1 yr
- Young children require presence of parent/ adult
- Surge capacity must accommodate space for parent/ caregiver & child

Parents Can help

Parents can help reduce the spread of flu like illness and other diseases in child care settings by:

☑ Keeping sick children home. Sick children should not attend school, child care or other group setting. Children should be fever free, without the use of fever-reducing medications for at least 24 hours before returning to school, child care or other group setting.

☑Having a back up plan in place in case your child is sick or in case your school or child care closes due to illness

☑Practicing good health habits at home and encouraging your children to do the same.

THANK YOU!

ACKNOWLEDGEMENTS:

DR AC MISHRA (DIRECTOR)

DR MS CHADHA

DR SD PAWAR

DR VARSHA POTDAR