Pandemic H1N1 2009

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WHO Role during pandemic (H1N1) 2009

• Under the International Health Regulations (2005)
  – Detect event (notification by Member States of unusual event of potential international concern)
  – Alert MS (announcement of the Public Health Emergency of International Concern (PHEIC) on 25 April 2009 to all NFP)
  – Assess the international risk
  – Provide recommendations (based on the advice of the Emergency Committee)
  – Monitor the event (including pandemic phases announcement)
  – Support country's response: GOARN, supplies (vaccine, antiviral, reagents)

• Normative functions
  – Provide guidelines: e.g. clinical management, infection control in hospitals, on aircraft, on ships, guideline on use of antiviral, mass gathering and so on
Conditions for a pandemic

- Emergence of a novel virus
  - Virus A mutated
  - Reassorted virus
  - Virus A subtype not circulated since a long time
- The population has little or no immunity
- The virus is able to produce sustained human to human transmission
Origins of gene segments, 2009 A(H1N1) virus

(Garten, et al. Science 2009)
Pandemic (H1N1) 2009 disease

- Young age groups affected
- High proportion of GI symptoms (10-50%)
- Deaths mainly due to viral pneumonia
- 20-40% of deaths occurring in healthy adults (with no underlying conditions)
Age-Related distribution of deaths from severe pneumonia, Mexico, 24 March- 29 April 09 compared to influenza seasons 2006-8

- During 5-weeks period, 2155 cases of severe pneumonia with 821 hospitalizations + 100 deaths: 87% of deaths and 71% of severe pneumonia cases aged 5-59 yrs

Chowell G et al, NEJM 2009
Description of pandemic

- Spread
  - Rapid
  - Slow
  - Waves
- Severity
  - Mild
  - Moderate
  - High
Influenza Pandemics in 20th Century Varied Widely in Terms of Severity and Spread

1918: “Spanish Flu”
2 waves, rapid spread
40-50 million deaths

1957: “Asian Flu”
1-2 waves, rapid spread
1-4 million deaths

1968: “Hong Kong Flu”
2-3 waves, slow spread
1 million deaths

H1N1  H2N2  H3N2
Pandemics spread

• 1957: spread to all China in 6 weeks and to the entire world in 6 months
• 2009-2010: spread to all continents in less than 9 weeks but to the entire world in 10 months.
  – Announcement of pandemic phase 6 on 11 June 2009- 74 countries reporting cases of (H1N1) 2009 virus
  – West Africa reported A(H1N1)pdm outbreaks only in early 2010
Continued Global Spread of H1N1
April 2009 - February 2010

April 2009
May 2009 (1 month)
July 2009 (3 months)
September 2009 (5 Months)
December 2009 (8 months)
February 2010 (10 months)
INFLUENZA PANDEMIC
MORTALITY IN AMERICA AND EUROPE DURING 1918 AND 1919

DEATHS FROM ALL CAUSES EACH WEEK EXPRESSED AS AN ANNUAL RATE PER 1000

NEW YORK
LONDON
PARIS
BERLIN

BERLIN RATES MISSING FOR AUG. 17, 31, OCT. 19, 1919.
**Time Course of the H1N1 Pandemic for select countries**

*Data sources vary by country and include: country provided epi curves of case onset, ILI consultation rates, Virus isolates by date, % positive specimens collected, media source (first case report for some countries)*

*Table developed by: Maria Van Kerkove PhD, MRC Centre for Outbreak Analysis and Modeling, Imperial College London*
Background pandemic phases (PP guidelines 2005)

• Phases are conceptual tool
  – To assist with planning on timing of control measures by countries & WHO
• Most national plans utilize 6-phase approach
  – WG consensus to retain 6 phases (in the 2009 PP guidelines) to minimize disruption to current plans
2005 Phases Structure & Pandemic Disease "Risk"

Phases 1-2

Interpandemic Period

Phases 3-5

Pandemic Alert

Pandemic

Phase 6

Post Pandemic

Time
Issues Raised by 2005 Phases

• Interpretation, especially regarding phase 4
  – "small cluster (s) with limited human-to-human transmission but spread is highly localized, suggesting virus is not well adapted to humans"
  – Why aren't we in phase 4 for H5N1?
• When to implement rapid containment?
• Do phases accurately portray pandemic "risk"? Does this pandemic phase system help to plan/ respond to pandemic?
• Revision of the 2005 Pandemic preparedness guidelines started in 2007 and was finalized early 2009
Proposed 2009 Phases Structure & Pandemic Disease "Risk"

1 - 3
Predominantly animal Infections; Limited transmissibility among people

4
Sustained H-2-H transmission

5 - 6
Geographic spread

Post Peak

Post Pandemic

Time
Gap between "technical" and "public" communication

It is just a technical definition!
WHO Member States with publicly available Pandemic Preparedness Plans at the start of the Pandemic (H1N1) 2009

* Plans published before April 2009

Note: Hong Kong reported a Pandemic Influenza Preparedness Plan in 2006.
Impact/severity of the pandemic

1. Disease
2. Vulnerability of the population
3. Capacity to respond

Proportion of at risk population
Previous immunity
What is different in this pandemic?

- First large scale response under the revised International Health Regulations (2005) framework
- Global sharing of information (and viruses) through expert networks
- Significant previous preparedness efforts including in the area of risk communication
- Access to antibiotics, antiviral, vaccine and high quality health care (ICU)
- Early detection and response at international level
Concluding Observations

• Certain events correctly anticipated
  – Eventual emergence of pandemic & more rapid spread than past
• Certain events theoretically acknowledged but a surprise
  – Start in North America
  – Origin of pandemic virus from swine H1 viruses
• Certain events simply surprising
  – Effectiveness of one vaccine dose
Concluding Observations

• Preparedness was crucial
  – Major difference from the past
• Preparedness remains significantly incomplete
  – Need to learn from this pandemic
• Flexibility & adaptation are essential
• Impact of control measure on the spread and severity are being assessed
Thank you!