Pandemic Influenza Planning
Child Health Network

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Objectives:

1. To briefly review why influenza pandemics occur.
2. To review the assumptions for pandemic planning for GTA.
3. To update on pandemic planning status: WHO, Federal, Provincial, Municipal, TAHSN.

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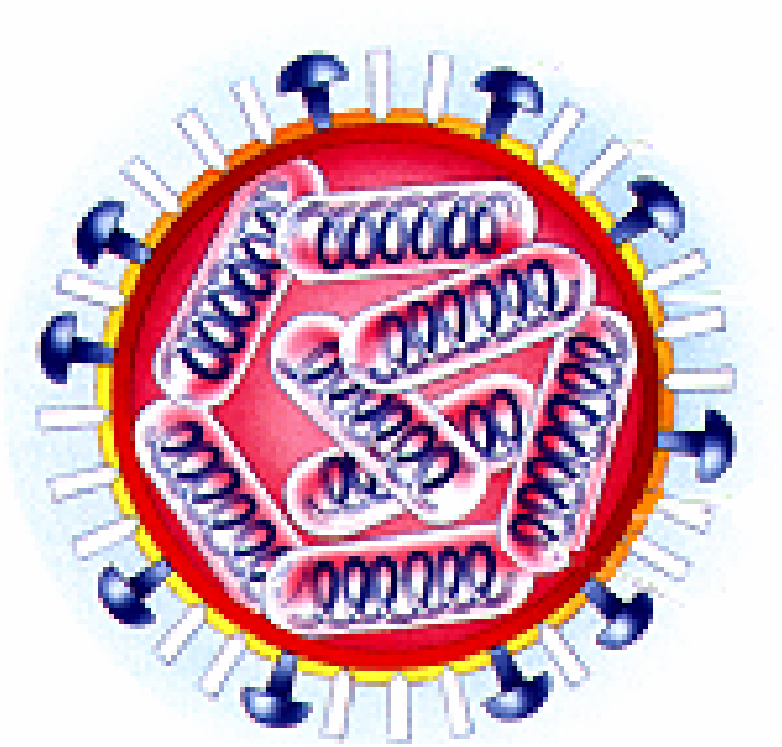
Influenza A Viruses

- **"*sloppy, capricious and promiscuous*"**
  - WHO, *Avian influenza: assessing the pandemic threat, 2005*
- lack proof-reading mechanism
  - small errors undetected/ uncorrected
  - constant stepwise changes
  - → antigenic drift: annual outbreaks, annual vaccine
- RNA segmented into 8 genes
  - swapping of gene segments during co-infection with 2 viruses → new "hybrid" virus
  - → antigenic shift: non-immune global population
  - → pandemic



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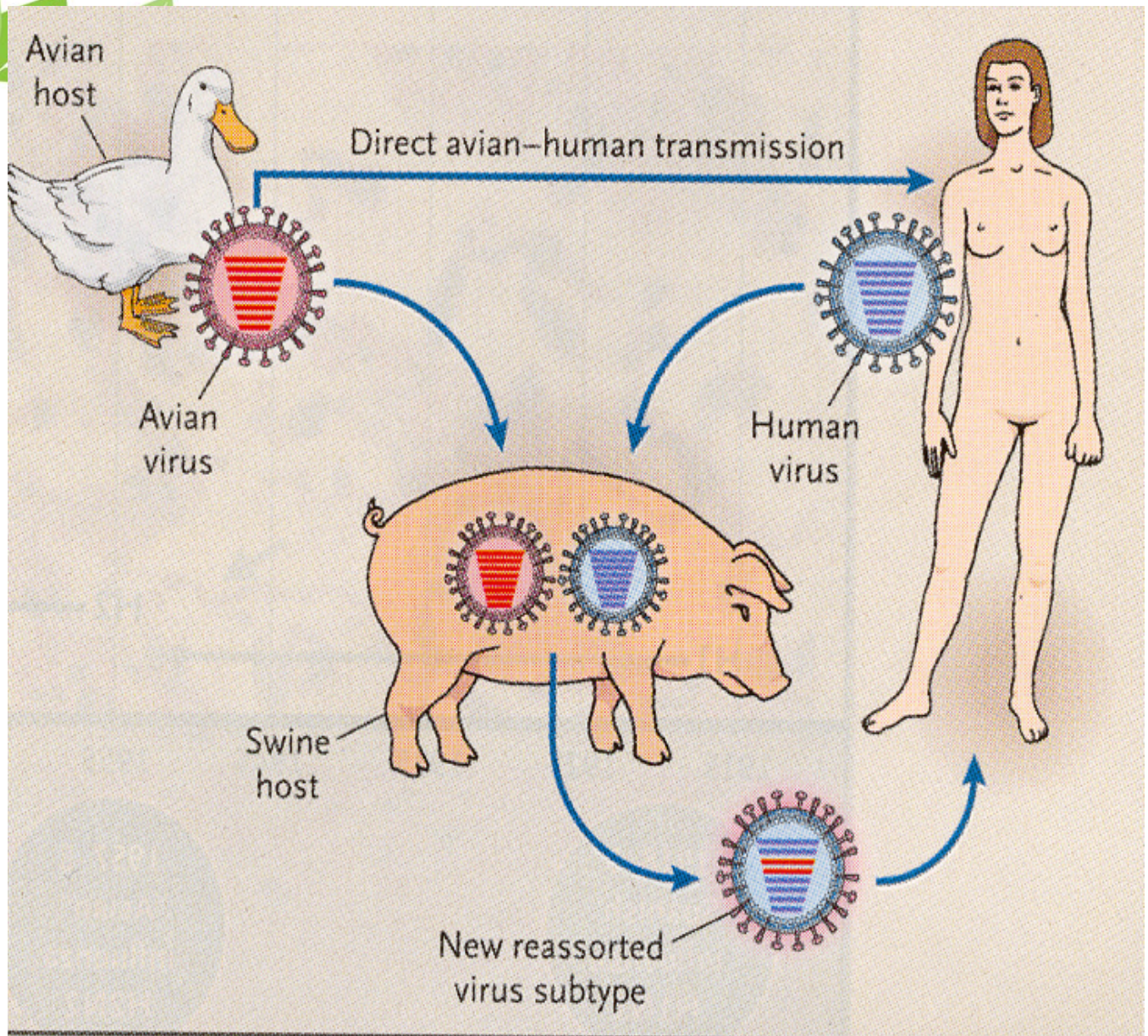

Figure 4. Generation of New Influenza A Virus Subtypes with Pandemic Potential.

INFLUENZA PANDEMICS

Year	Type	Estimated deaths
1889-1890	H2N2	unreported
1918-1919 (Spanish flu)	H1N1	20-30 million
1957 (Asian flu)	H2N2	1 million
1968 (Hong Kong flu)	H3N2	1 million

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Influenza ≠ SARS

SARS = Containment

Pandemic Influenza = Capacity

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Pandemic Influenza Planning Assumptions

- When pandemic strain identified, it will appear in GTA in 1-3 months
- For the GTA, a pandemic of moderate severity will result in:
  - 1 million people ill
  - 420,000 will require some level of medical assistance
  - 7-8,000 will require hospital admission

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Pandemic Influenza Planning Assumptions

- influenza is a **community spread** organism
  - once introduced, spreads rapidly
- self-sufficiency will be required as situation will be global
- first wave will last 6-8 weeks
  - will be followed by 1-2 more waves
  - subsequent waves may be more severe
- will need to continue with other urgent work

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Pandemic Influenza Planning Assumptions

- Vaccine will not be available for the first wave
  - supply/distribution controlled by Public Health Agency of Canada priority list
  - HCWs are top priority once vaccine available
- Antiviral agents will be in inadequate supply
  - supply/distribution controlled by Public Health Agency of Canada priority list
  - some provinces considering own stockpile

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Pandemic Influenza Planning Assumptions

- Large numbers of patients will require triage
- Current hospital beds will be overwhelmed
- Current ventilator capacity will be overwhelmed
- Health care providers and their families will be ill

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Impact of 35% Influenza Attack Rate on Hospital Capacity

35% Attack Rate - 8 Weeks		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Hospital Admission	Weekly admissions	3,675	6,125	9,188	11,638	11,638	9,188	6,125	3,675
	Peak admissions / day				1,814	*1,814*			
Hospital Capacity	# of patients in hospital	2,702	4,503	6,754	8,555	8,858	7,786	5,971	3,917
	% capacity needed	16%	26%	39%	50%	*52%*	45%	35%	23%
ICU Capacity	# of patients in ICU	551	1,169	1,795	2,371	2,566	2,497	1,984	1,370
	% ICU capacity needed	37%	77%	119%	157%	*170%*	165%	131%	91%
Ventilator Capacity	# patients on ventilators	276	585	898	1,186	1,283	1,248	992	685
	% usage of ventilators	25%	53%	82%	108%	*117%*	114%	91%	62%
Deaths	# of influenza deaths			726	1,209	1,814	2,298	2,298	1,814
	# of deaths in hospital			508	847	1,270	1,609	1,609	1,270

World Health Organization

Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1) Reported to WHO

19 February 2007

Country	2003		2004		2005		2006		2007		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
Azerbaijan	0	0	0	0	0	0	8	5	0	0	8	5
Cambodia	0	0	0	0	4	4	2	2	0	0	6	6
China	1	1	0	0	8	5	13	8	0	0	22	14
Djibouti	0	0	0	0	0	0	1	0	0	0	1	0
Egypt	0	0	0	0	0	0	18	10	4	3	22	13
Indonesia	0	0	0	0	19	12	56	46	6	5	81	63
Iraq	0	0	0	0	0	0	3	2	0	0	3	2
Nigeria	0	0	0	0	0	0	0	0	1	1	1	1
Thailand	0	0	17	12	5	2	3	3	0	0	25	17
Turkey	0	0	0	0	0	0	12	4	0	0	12	4
Viet Nam	3	3	29	20	61	19	0	0	0	0	93	42
Total	4	4	46	32	97	42	116	80	11	9	274	167

Total number of cases includes number of deaths.
WHO reports only laboratory-confirmed cases.
All dates refer to onset of illness.

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Avian Influenza

≠

Pandemic Influenza

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WHO Pandemic Influenza Phases

Interpandemic period:

- Phase 1: no new influenza virus in humans
- Phase 2: circulating animal virus presents risk of human disease

Pandemic alert period:

- Phase 3: human infection with new subtype; no or rare human-to-human spread
- Phase 4: small clusters; limited, localized human-to-human spread
- Phase 5: large clusters; human-to-human spread still localized

Pandemic period:

- Phase 6: increased and sustained transmission in general population

Postpandemic period: return to interpandemic period

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Canadian Pandemic Influenza Plan for the Health Sector (CPIP)

- http://www.phac-aspc.gc.ca/cpip-pclcpi/
- updated version December 2006
- some new annexes, e.g. Public Health Measures
- some existing annexes targeted for revision in 2007, e.g. Clinical Care Guidelines and Tools
- Pandemic Planning Directorate created
  - ongoing dialogue with WHO, UK, US, etc.

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Ontario Health Pandemic Influenza Plan (OHPIP)

- http://www.health.gov.on.ca/english/providers/program/emu/pan_flu/pan_flu_plan.html
- version 3 September 2006
- significant additional material
  - Chapter 18 Paediatric Services
  - Chapter 17 Acute Care Services
- Campbell SARS Commission Final Report
  - precautionary principle

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Toronto Public Health Pandemic Influenza Plan

- http://www.toronto.ca/health/pandemicflu/pandemicflu_plan.htm
- updated March 2006
- current work emphasizing development of assessment and treatment centers
  - Goal: to provide “early treatment” and to keep influenza patients out of hospital emergency departments
  - distribution centers for oseltamivir
  - working with TAHSN

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TAHSN Pandemic Influenza Planning Guidelines

- http://portal/tahsn/Shared%20Documents/Pandemic%20Planning/TAHSN%20Pandemic%20Influenza%20Planning%20Guidelines%20-%20May%2031,%202006.pdf
- May 2006
- proposal to have cross-sector meeting in spring to compare planning assumptions
- proposal to have system-wide table-top exercise

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Next steps: “evergreen” documents

Review current plans as more information available and situation changes:

- monitor revisions of federal/provincial/local plans
- monitor WHO updates:
- http://www.who.int/csr/disease/avian_influenza/en/

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First Case of Avian Influenza in Florida

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Infection Control

- influenza is transmitted mainly by droplet and contact routes
- PPE for droplet/contact transmission is: hand hygiene, mask/respirator, gloves, gown, eye protection
  - hand hygiene most important, followed by mask
- once influenza has entered the community, use of PPE within the health care setting will have limited efficacy

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Limitation of effectiveness of PPE during a pandemic

- Influenza spreads rapidly in the community
  - Risk of acquiring influenza is in all community settings
- Facility infection control strategies will have little overall impact on preventing staff acquisition of influenza
  - Personal protective equipment will be worn at work; once HCWs leave work they are exposed in the community
- Influenza attack rates of HCWs are equal to general population
  - Majority of infections do not occur in hospital

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Antiviral prophylaxis for HCWs

- Health care resources will quickly become overwhelmed when the pandemic strain enters the community
- All available health care personnel will be required to assess/treat influenza patients and provide other urgent/emergent services
  - in order to reduce morbidity and mortality in the general population, we must maintain the health of our health care workforce
- Without prophylaxis, assume attack rate of HCWs equal to general population (35% for moderate pandemic)
- The only way to protect HCWs 24/7 is with antivirals

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