

Pandemic Influenza in a Nutshell – 27 January 2007

Pandemic:

- Regular disease experience (business as usual)
- Epidemic (more than expected)
- Pandemic (a really big epidemic, involving many people and countries)

Influenza: a virus affecting birds and mammals, e.g. humans, cats, dogs, horses, camels, etc.

- A vs B (A tends to cause more severe disease)

Different kinds of influenza going by who's affected – human influenza mostly affects humans, bird influenza mostly affects birds, etc.

- Bird influenza is also called “avian influenza” (AI) – normally, it doesn't make birds sick at all or if it does, it just gives them diarrhea

Influenza has a “coat of many colours” – we give it different names depending on the different types of protein on the outside coat of the virus

- H-types and N-types – e.g., H5N1 or H3N2
 - The virus “changes the shading of the colours” of its coat so the immune system won't recognize it

Regular human influenza: aka seasonal influenza – comes around every winter

- Causes anything from no symptoms to cough with aching, prostration, and sometimes fever

Epidemic human influenza: a season when more people than usual get influenza

- Usually because the virus has changed the colours of its coat somewhat

Pandemic influenza: when many more people than usual get influenza, in many countries

- Usually because the virus has changed the colours of its coat a lot, so nobody's immune system is ready to fight it off
- Right now we have ongoing pandemic influenza in birds – influenza A H5N1 – making birds sick and killing them – a BAD virus for birds.
 - If humans catch it, it's a BAD virus for humans, too – over 50% death rate
- So far, AI H5N1 is hard for humans to catch – has been some human to human transmission but not much.
 - If AI H5N1 learns to go from human to human efficiently, we will have a human pandemic.
 - We HOPE if this happens, the changes the virus has to make to jump easily from human to human will also make it less lethal to humans, but no guarantees.
 - The 1918 influenza pandemic we think had around 2-5% mortality
 - Expect a pandemic to come in waves (2nd wave worst) lasting 6 mo or more

What H5N1 infections does to humans

- May start with cough, or with diarrhea, or with headache and confusion
- Kills by cytokine storm – triggers such a fierce immune response, the body damages its own tissues – massive organ failure and death
 - Worst illness and highest mortality in teens and young adults (was same in 1918)
 - 1918 virus recreated – caused cytokine storm illness in monkeys

Influenza virus has four ways to get from one host to another:

1. Direct sharing of infected body fluids (e.g., kissing)
2. Infected droplets (from coughing, singing, loud talking, diarrhea, toilet flushing) – can travel 3 feet or more
3. Dried out droplets (droplet nuclei) – can float in air for hours and go through ventilation systems
4. Via things (can last for days on surfaces): hands, money, doorknobs, rails, salt shakers, toilet handles, etc. etc.

Four ways not to get influenza

1. Safe greetings – elbow bump, no-touch high fives, air kisses, hugs, “bow hello and wave goodbye”
2. Catch droplets before they can spread – everyone out in public wears masks
3. Stopping droplet nuclei: UV light, moist air, special N95 masks to protect the uninfected
4. Killing virus on surfaces: hand-washing, hand-washing, hand sanitizing, hot water washing & dryer drying of laundry, alcohol or dilute bleach on frequently touched surfaces

Don't give the virus a head start: the bigger the dose of virus you get into you, the more of a head start the virus has on your immune system

Stock up and cocoon - the less people mingle, the harder it is for the virus to spread

- Schools will be closed
- Work from home
- Remote shopping with delivery of goods
- Staggered and/or cooperative shopping

Treatment

- Antivirals (e.g., oseltamivir – Tamiflu, others) may be some help
- Statins & correcting vitamin D deficiency may help by reducing cytokine storm
- Symptomatic and supportive (oxygen)
- Passive antibodies transfusion (from those who have recovered)
- Take time (weeks) for recovery – sudden death after recovery from 1918 pan flu (?cardiac)

Vaccine

Expect about 6 months from start of an influenza pandemic until vaccine available

Be ready

- If enough people get sick, despite the best planning, services will begin to fail
 - Health care will be under the greatest stress (wartime type triaging may be needed)
 - Water, power, other utilities
 - Resupply of good to retailers (food, medicine, bleach, masks, toilet paper, soap, etc.)
- Who will feed & care for your family if you are sick?
 - Mutual assistance pacts with small groups who live close together