Pandemic influenza preparedness and mitigation in refugee and displaced populations
WHO training modules for humanitarian agencies

Module 1
Influenza - what is it and how do you get it?

World Health Organization

Objectives of module 1

- Understand the difference between avian (bird), pandemic, and seasonal influenza
- Understand how pandemic influenza arises
- Understand the magnitude and consequences of pandemic influenza
- Know the symptoms and signs of influenza
- Understand how influenza is spread (bird-to-bird, bird-to-human and from human-to-human)
- Understand how to reduce the spread of influenza from birds to humans now, and how to reduce its spread between humans during a pandemic

What is influenza?

Acute contagious **infection of the airways and lungs**

It is caused by one of the **influenza viruses**.

What the difference between avian, pandemic and seasonal influenza?

- All are caused by viruses called **INFLUENZA VIRUSES**
- Avian influenza occurs in birds ("bird flu")
- Pandemic influenza – happens every 30-40 years, affects humans and causes widespread (millions of cases of) disease and death worldwide in a short period of 2-3 months.
- Seasonal influenza – happens yearly during winter season / cold months, affects humans and causes disease but on a smaller scale. Vulnerable populations such as the elderly are at greater risk.

Where does influenza come from?

- So far, all human influenza viruses have originally come from birds
- There are many types of bird (avian) influenza viruses
- **Birds** have bird (or avian) influenza viruses and get "bird flu"
- That means bird (or avian) influenzas usually only infect birds and **not** humans
- Animals also have their own influenza viruses which generally don't infect other species (e.g. cats, horses, bats etc..) – they have never been passed on to humans but it is always a possibility

How do birds pass influenza to other birds?

- Sick birds can **cough and sneeze** → these respiratory droplets can be breathed in by other birds
- Birds can also transmit influenza through their **faeces**

Can humans get avian (bird) influenzas?

- YES
- When birds and humans live close together → there is a chance that a bird influenza virus can change itself and jump to infect a human.
- The more close contact there is between birds and humans → the higher this chance that a bird virus will jump to infect a human

How can bird influenza be passed from birds to humans?

- Contact with sick or dead birds/chickens
- Contact with faeces of sick or dead birds/chickens
- Plucking, preparing sick or dead birds/chickens for food
- Eating sick or dead birds/chickens
- Not cooking chickens or eggs thoroughly before eating
- Not washing hands after touching raw chicken and juices
- Not washing surfaces that have been used to prepare food

Has a bird virus recently infected humans? (1)

- YES
- A **new bird virus** has emerged recently called H5N1
- It is **very lethal** - millions of birds in many countries have been infected and killed by H5N1.
- This **virus has changed** since it first emerged in birds and has now developed the ability to **jump from bird to human**

Has a bird virus recently infected humans? (2)

- **H5N1 bird virus** has jumped from birds to infect over 250 humans and about 60% of those who were infected have died → **very lethal in humans**
- To be infected, **humans need close contact with sick/dead birds or their products** (one of the actions described on slide 8)
- **Up to now**, humans infected with this bird virus cannot pass the virus from human to human easily.

What happens if humans get bird influenzas?

- Since humans don't **normally** get bird viruses → we have **NO IMMUNITY OR PROTECTION** against them

- Because we don't have immunity, when a bird virus jumps and infects a human → **the disease in humans is very severe**

Is human contact with a bird always necessary to get a bird influenza virus? (1)

- In general, that is the case..
- BUT a bird influenza virus can **change itself again** and may develop the ability to **pass easily from human to human through coughs/sneezes**
  - **It has now become a human influenza virus**
  - **Humans will not need contact with birds to be infected any more**
  - **The disease can spread rapidly around the world as coughs and sneezes are common and humans have no immunity or protection against the virus**

→ **this is what is called an influenza PANDEMIC.**

Is human contact with a bird always necessary to get a bird influenza virus? (2)

- **This is what the world is worried about!** - if the H5N1 influenza virus changes again and gets this ability to pass easily from human to human.
- The virus just needs **ONE opportunity** to change itself to get this ability.
- It can happen in just **ONE person** and a pandemic will result.
- It can **happen at any time** – the more contact there is between sick birds and humans → the more opportunity for the virus to change

What is a pandemic?

- A pandemic is a worldwide spread of an influenza virus affecting all humans and making them sick
- PAN = ALL
- DEMOS = HUMANS
- It can be viewed as hundreds of large epidemics occurring in many different countries at the same time

Pandemic Influenza

- So, a pandemic can start when **three things** have happened:
  - a new influenza virus emerges; √
  - it infects humans, causing serious illness; √
  - it spreads easily from human to human, without needing contact with birds ☐

- Historically, pandemics occur about 3 times per century
- In the 1918 pandemic – there were 40-50 million deaths worldwide
- In the 1957 pandemic – there were 2 million deaths
- In the 1968 pandemic – there were 1 million deaths

What will happen during a pandemic?

- The virus will pass around the world from human to human
- Many sick people – many millions may become sick
- Many deaths – millions may die
- Fear
- Panic
- Social disruption
- Economic losses

How many will be affected?

WITHIN A 2-3 MONTH PERIOD

- 15 to 35% of population may fall sick (attack rate)
- Hospitalizations, 4 to 5% of population
- Case fatality rate, 1 to 2% of sick people

FOR 100,000 PEOPLE

- 15,000 to 35,000 people sick within 2-3 months
- 4000 to 5000 people with severe illness
- 150 to 700 deaths in 2-3 months

How long will it last?

- **2-3 months**
- As it travels around the world, it may **return again** for 2-3 months each year for 2-3 years (i.e. there may be **2-3 waves** of this event)

What will happen after a pandemic?

- As **more and more people are exposed** to this pandemic virus → **immunity develops** → there are less and less cases
- BUT **humanity must suffer much disease and death first** before this immunity develops
- This **pandemic virus, now a HUMAN influenza virus (no longer a bird virus)**, does not disappear → it **continues to circulate in humans**
- There are many influenza viruses from past pandemics that circulate in humans now → these cause **seasonal influenza** in humans

Seasonal influenza

- Seasonal influenza epidemics occur around the world every year
- 1 in 5 people are affected each year
- Elderly people are particularly at risk
- A vaccine is available for seasonal influenza
- This is possible as components of the viruses are already known (from past pandemics)
- It takes 6 to 8 months to produce seasonal influenza vaccine

Vaccines

- **Seasonal human influenza vaccine**
  - protects against human seasonal influenza;
  - it does **not protect against avian influenza nor pandemic influenza**

- **Pandemic influenza vaccine**
  - there is no pandemic vaccine available
  - it can **only be made once a pandemic starts** as the components of this new pandemic virus are needed for the vaccine
  - a pandemic influenza vaccine will take 6 to 8 months to develop from the time that the pandemic virus emerges
  - when available, use will be limited due to limited quantities (currently the world's vaccine factories can only produce 300 million seasonal influenza vaccines in one whole year)

Influenzas summary

- **Avian (bird) influenza affects birds primarily**
  (can affect humans occasionally)

- But bird influenzas can cause **human influenza pandemics** if the bird viruses change and develop the ability to transmit easily from human-to-human.

- **Human influenzas**
  - Pandemic - every 30-40 years, disease and death worldwide in a short period of 2-3 months. No immunity, no vaccine.

  - Seasonal - yearly during winter season, causes epidemics on a smaller scale. Some immunity already, vaccine.

Is influenza the same as the common cold?

- Influenza is **different from** the **common cold**

- It is caused by a **different viruses** **to the common cold**, with symptoms that are usually **more severe**

- **Common cold** affects **upper** parts of respiratory tract.

- **Influenza** can affect **upper** and **lower** parts of the respiratory tract.

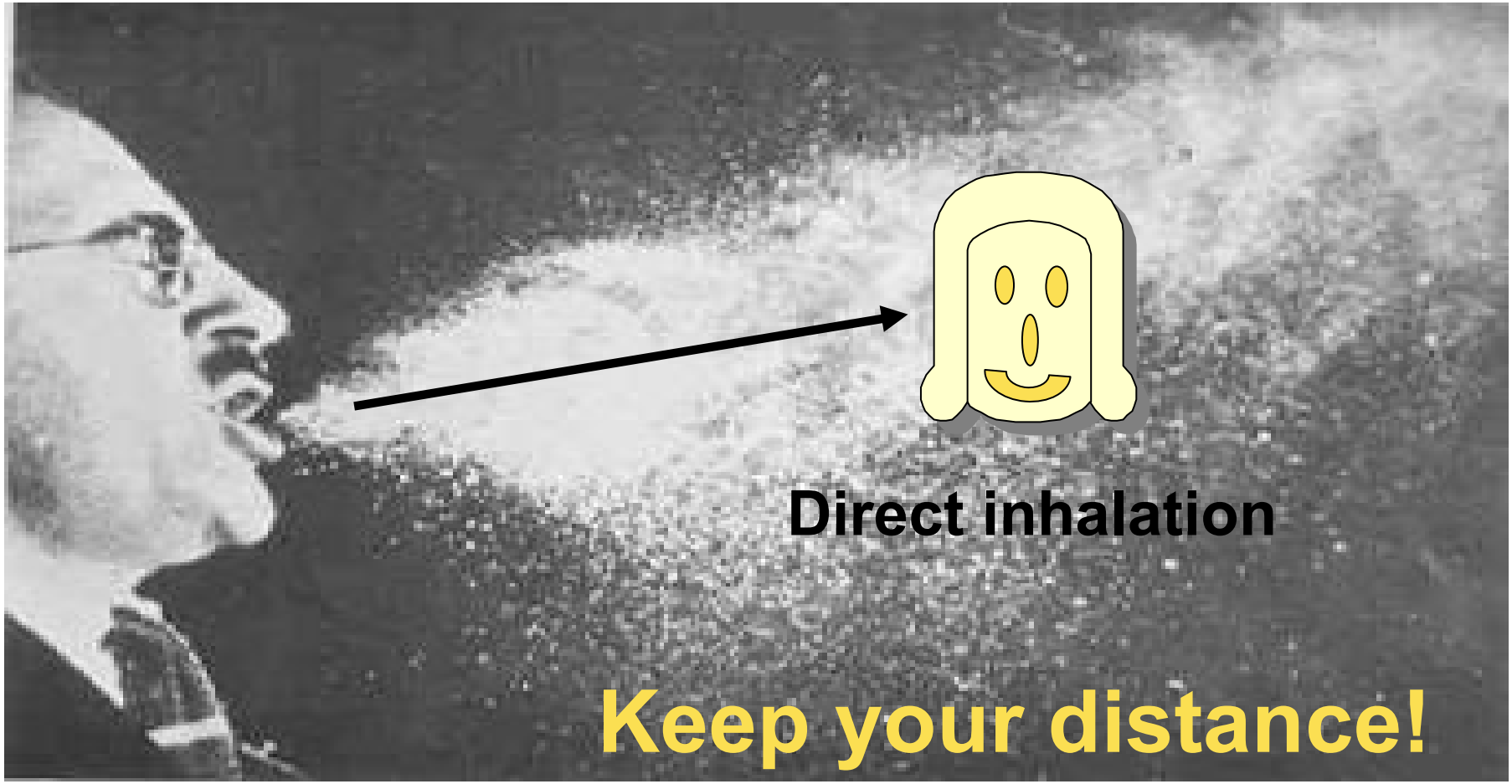
Influenza signs and symptoms

- Rapid onset of:
  - **Fever > 38.5°**/Chills
  - **Dry (non-productive) cough**
  - Body aches / headaches
  - Sore throat
- Range of symptoms differ by age
  - Vomiting, diarrhoea, encephalitis are more common in children
  - Fever, often alone, in infants
- Symptoms indicating severity and need for referral
  - Shortness of breath / difficulty breathing

How is influenza spread between humans?

Source: Photo from the slide collection, Department of Medical Microbiology, Edinburgh University. From The Microbial World: Airborne Microorganisms, by Jim Deacon, Institute of Cell and Molecular Biology, The University of Edinburgh, at http://helios.bto.ed.ac.uk/bto/microbes/airborne.htm

How is influenza spread between humans?



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Commonest way of spreading influenza between humans

- **Large particle respiratory droplets**
  - **produced when someone coughs or sneezes**
  - **inhaled by someone who is in close proximity (usually 1m or less)**
- This is the commonest way of transmitting influenza virus
- Large particle respiratory droplets travel only **short distances (usually 1 m or less) through the air**
  - The droplets do not remain suspended in the air
- Requires close contact (usually 1m or less) between source (sick person) and recipient (well person).

Other ways of spreading influenza between humans

- **Self-contamination through hand-to-nose, hand-to-eye, hand-to-mouth transmission**
  - important, but secondary to direct large particle respiratory droplet.
  - direct contact
    (touching virus-contaminated skin/hands of another person, AND then touching your own nose, eye or mouth.
  - indirect contact
    (after touching virus-contaminated clothes, objects, surfaces, AND then touching your own nose, eye or mouth)

- **Small particle transmission at several metres (aerosol)**
  - Respiratory particles *can* be suspended as small particles in air but only with special medical procedures such as suction, aspiration, intubation, nasopharyngeal swabbing.

What to do? (1)

- Prepare
- Prepare
- Prepare

Plan and then…
Put into practice now

Pandemics are naturally recurring events; **sooner or later a pandemic will arrive**.

What to do? (2)

- **Strengthen surveillance now** (help in early detection of not only influenza but also other epidemic-prone diseases!)

- Implementation of **measures to prevent infection** (which will prevent many other infectious diseases like DDs and ARI now!)

  - **Keep your distance !**
  - **Cover coughs and sneezes !**
  - **Wash your hands !**

Summary of what we learnt

- The difference between bird, pandemic, and seasonal influenza
- How pandemic influenza arises
- The magnitude and consequences of pandemic influenza
- Symptoms and signs of influenza
- How influenza is spread (bird-to-bird, bird-to-human and from human-to-human)
- How to reduce the spread of influenza from bird-to-human now, and from human-to-human during a pandemic

Thank you!