

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

<b>Responsible/facilitators</b>	Agency medical coordinator
<b>General Objective</b>	Understand the mechanism how influenza is transmitted.
<b>Specific Objectives</b>	<ul style="list-style-type: none"> <li>• Understand the difference between avian (bird), pandemic, and seasonal influenza</li> <li>• Understand how pandemic influenza arises</li> <li>• Understand the magnitude and consequences of pandemic influenza</li> <li>• Know the symptoms and signs of influenza</li> <li>• Understand how influenza is spread (bird-to-bird, bird-to-human and from human-to-human)</li> <li>• Understand how to reduce the spread of influenza from birds to humans now, and how to reduce its spread between humans during a pandemic</li> </ul>
<b>Methodology</b>	Presentation: Power point or printed in A3 (laminated)
<b>Instructions for facilitators</b>	Use time to get to know their participants, their level and their perceived needs. Participants could present each other.  Included in body of module
<b>Messages to retain</b>	That simple methods are available to limit disease and therefore death  Their immediate application can limit transmission of many other communicable diseases, including influenza, now and in the future
<b>Contents</b>	See text
<b>Documents</b>	Power point or printed in A3 presentation
<b>Bibliography</b>	none

- Duration = 1 hour 15 minutes

SLIDE 1

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?



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SLIDE 2

## 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

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## What is influenza?

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

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

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- Influenza is a term for a viral infection of the respiratory tract caused by an influenza virus.

## What the difference between avian, pandemic and seasonal influenza?

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- 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.

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## Where does influenza come from?

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- 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



- Avian influenza is a disease of birds, it does not affect humans except in rare circumstances. Avian influenza is known commonly as "bird flu".
- There are many types of "avian influenza". Most cause a mild disease in birds and are called "low pathogenic (LPAI)".
- Some avian influenza viruses can cause serious illness and death in birds, and are called "highly pathogenic avian influenzas (HPAI)".

## How do birds pass influenza to other birds?

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- 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?

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- 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?

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- **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)

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- 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**



- The highly pathogenic forms of bird influenzas (HPAI) can sometimes change and develop the capacity to cause disease in humans - as has occurred with the H5N1 avian influenza virus.

## Has a bird virus recently infected humans? (2)

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- **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?

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- 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**.

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## 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

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## What is a pandemic?

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- 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

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- It is important to note that ANY new influenza virus meeting the 3 conditions above could cause a pandemic.
- The H5N1 avian influenza virus met the first two conditions on the above slide: a new virus for humans (H5N1 viruses have never circulated widely among people), and more than 100 human infections, killing over half of them.
- All prerequisites for the start of a pandemic have therefore been met bar one: the establishment of efficient and sustained human-to-human transmission of the virus.
- The risk that the H5N1 virus will acquire this ability will persist as long as opportunities for human infections occur.
- These opportunities, in turn, will persist as long as the virus continues to circulate in birds, and this situation could endure for some years to come.

## 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)

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## 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

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## 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**



- Annual outbreaks of seasonal influenza occur since the influenza virus changes slightly every year and thus can by-pass the immunity people have developed previously.
- One in 5 people are affected each year. Elderly people are particularly at risk and may die of the disease.
- Seasonal influenza is also responsible for many lost working days.

## 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)

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## 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.

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## SLIDE 23

### Is influenza the same as the common cold?

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- 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.

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- "Colds" are very common, particularly during winter and are caused by respiratory viruses. Most cases are mild involving a cough or a runny nose with headache and general malaise with little or no fever.
- Influenza "or flu" is caused by specific respiratory viruses called influenza viruses and is also common in winter. Influenza is a more severe version of a common cold but unlike colds it is accompanied by fever.

## SLIDE 24

### Influenza signs and symptoms

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- 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

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- Key features are fever and dry cough.
- Other symptoms include muscle aches and pains, sore throat and chills.
- There may be shortness of breath and difficulty breathing in more severe cases.

## SLIDE 25

### 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.bio.ed.ac.uk/biomicrobes/airborne.htm>

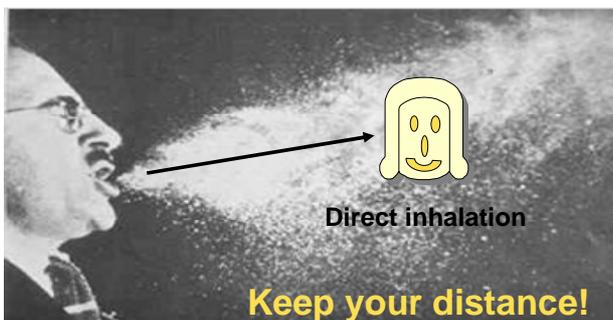
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- Look at the photo and make participants describe what they see, in terms of distance, distribution, weight, size of the droplets.
- This is an example of large respiratory droplet transmission when someone sneezes.
- Some droplets may make it beyond 1 meter but the bulk of them fall at a relative short distance.

## SLIDE 26

### 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.bio.ed.ac.uk/biomicrobes/airborne.htm>

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- These respiratory droplets can enter the respiratory tract of someone who is standing close to this person.
  - **Social distancing is therefore a key measure in preventing infection.**

## SLIDE 27

### 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.bio.ed.ac.uk/biomicrobes/airborne.htm>

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- If the person covered his sneeze with a tissue or scarf or mask, or coughed/sneezed into his sleeve, the risk of spraying the droplets onto someone else or onto surfaces would be gently reduced.
  - **Thus covering coughs and sneezes is a second key behaviour.**

## SLIDE 28

### 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.bio.ed.ac.uk/biomicrobes/airborne.htm>

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- These droplets, however, could land on a surface which may in turn be touched by someone else who could contract the infection.
- If hands are not washed after coming in contact with these respiratory droplets (either from coughing/sneezing directly onto them, or after touching a contaminated surface, or from caring for a sick person and touching them or their contaminated clothes/utensils) - infection can be further transmitted.
  - **Thus washing hands with soap and water is another key way of preventing infection.**

## 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).



- Thus the key ways of preventing transmission of infection through large particle respiratory droplets are:
  - **Keeping your distance** from others
  - **Covering your coughs and sneezes (respiratory etiquette)**
    - sneeze/cough into your sleeve or cover with tissue or scarf or mask
    - if you have coughed/sneezed into your hands, wash hands immediately with soap and water
    - wear masks (or scarves if masks unavailable) when in close contact with others

## 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.



- **Hand washing** is key in preventing hand-mouth, hand-nose, hand-eye transmission.
  - Hand washing should be performed before eating or feeding others, after coughing/sneezing onto hands, after touching a sick person or their bed sheets, clothes and utensils, before and after preparing food, after going to the toilet.
- Some procedures practised inside health units, such as suction or aspiration of the throat or intubation or nasopharyngeal swabbing, can produce respiratory particles that are very small and can remain suspended longer in the air and travel longer distances. These are called aerosolized particles.
- In these cases a regular surgical mask will not be sufficient to prevent transmission and specialized, tight-fitting masks called **particulate respirators** are needed. This will be addressed in the infection control module.

## What to do? (1)

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- Prepare
  - Prepare
  - Prepare
- Plan and then...  
Put into practice  
now

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

- During a pandemic, people will only be able to implement actions for which they have prepared.

## What to do? (2)

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- **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 !

- Infection control is a key public health pillar.
- Strengthening universal hygiene behaviors in the community and infection control procedures in health care facilities is not only important during a pandemic but for the prevention of a vast array of communicable diseases in the present and in the future.

## Summary of what we learnt

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- 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!

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