

AIR, FOOD AND WATER-BORNE HUMAN INFECTIONS



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AIR-BORNE HUMAN INFECTIONS



Objectives

- Define airborne diseases and droplet infections
- Transmission mode
- Who is at risk
- Possible causes
- Symptoms
- Prevention modes

Airborne diseases

- Diseases caused by pathogens that small enough to be discharged from an infected person in a form of tiny drops called aerosols
- The pathogen remains suspended in air dust particles, or respiratory and water droplets that are $<5\mu\text{m}$ in diameter

Droplets infections

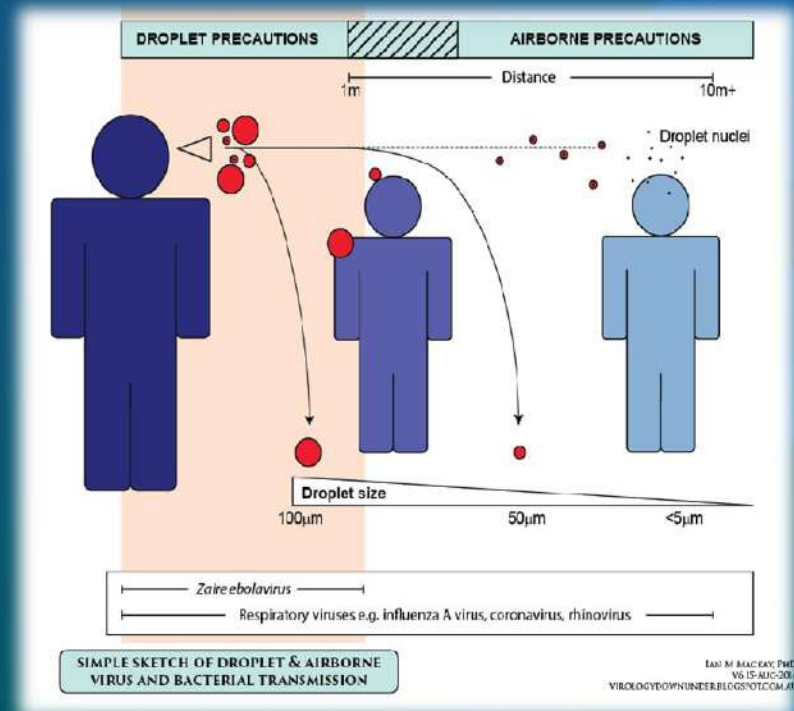
- Caused by ingestion or aspiration of droplets carrying pathogens
- Droplets are respiratory secretions (>5 μm in diameter) that produced during laughing, talking, coughing or sneezing

Droplets infections

- Transmission occur when an infected droplet propelled a short distance in the air and then fall on the host's mouth or nasal mucosa or eyes
- Droplet travel 1-2 meter before drying out or falling on the ground

Why droplets are not considered as an airborne transmission

- Droplets are larger than aerosols and don't remain airborne for long
- They fall into the ground or onto surface shortly after being expelled



Airborne and droplets infectious diseases

Airborne

Influenza _ both*

Varicella (chickenpox)

Measles

Anthrax

Tuberculosis

Droplet

SARS_both*

Pertussis

Strep throat

Ebola

Norovirus_both*

Upper respiratory tract (URT)

- Indigenous microflora of the URT may cause opportunistic infections
- Infectious diseases of the URT (e.g., colds and sore throats) are more common than of the LRT
- They may predispose the patient to more serious infections, such as sinusitis, otitis media, bronchitis, and pneumonia

Lower respiratory tract infections are the most common cause of death from infectious diseases

Transmission

Airborne

Aerosol mist or dust containing the pathogen

Particles are suspended in air and travel long distances from their origin

Indirect: Face-to-face contact not needed

Droplet

Close contact with an infected individual (1-2m)

Direct contact with a contaminated object (touching)

Improper hand cleaning

Sharing food, drinks or eating utensils with an infected

Who is at risk

Measles

- Reports of measles go back to at least 700 years
- The first scientific description of the disease and its distinction from smallpox attributed to the Muslim physician Ibn Razi(Rhazes) 860-932 who published a book entitled "Smallpox and Measles"

The Serious of the disease

According to WHO:

- It remains a leading cause of death among young children globally
- An estimated 197 000 people died from measles in 2007, mostly children under the age of five
- More than 20 million people worldwide are affected by measles each year
- Measles outbreaks are common in many areas, including Europe. For many U.S. travelers and expatriates

The causative agent

- Measles is an infection of the respiratory system caused by a virus
- A Paramyxovirus of the genus Morbillivirus

Transmission

- Through respiration:
 - The highly contagious virus is spread by coughing and sneezing, close personal contact
 - or direct contact with infected nasal or throat secretion
- The infection has an average incubation period of 14 days (range 6-19 days)
- Infectivity lasts from **2-4 days prior** and to **2-5 days following** the onset of the rash

People at high risk

- Measles a Childhood Infection
- Highest in susceptible infants younger than 12 months, school-aged children, or young adults
- Children with immunodeficiency due to HIV or acquired immunodeficiency syndrome (AIDS), leukaemia, alkylating agents, or corticosteroid therapy, regardless of immunization status
- Malnutrition
- Pregnancy
- Vitamin A deficiency

Disease manifestations

- 10 days after the initial exposure to the virus:
 - The classic viral symptoms:
 - Fever
 - Non-productive cough
 - Conjunctivitis
 - Malaise
 - A rash is leading symptoms
 - Typically begins at the hairline and spreads caudally over the next 3 days
 - The rash lasts 4-6 days and then fades from the head downward

Precautions

- Follow standard precautions
 - Hand washing
 - Wearing mask
 - Patient must use tissue while coughing or sneezing
 - Avoid close contact with patient's belongings

Prevention

- VACCINATION

- The Vaccines are Live attenuated
- The immunity produce may be life long
- Measles vaccine is given as MMR Vaccine
- The measles vaccine is often incorporated with rubella and/or mumps vaccines in countries where these illnesses are problems
- It is equally effective in the single or combined form
- The combination proved to be effective and safe
- Two doses of Measles Vaccine

The End