MEDICAL EDUCATION RESOURCE

VIRAL DISEASES: General

VIRAL DISEASES ?

Definition ?

- **Viral diseases** are **communicable diseases caused by viruses**
- Characterized by:
    - High infectivity
    - Rapid spread
    - Epidemic potential ?

Public Health Importance ?

- Major contributors to:
    - **Morbidity and mortality worldwide ?**
- Features:
    - **Frequent outbreaks and epidemics ?**

- Pandemic potential (e.g., influenza, COVID-19)

- High burden in:
  - Children
  - Immunocompromised

Viral Diseases as an Important Group ?

- Form a **significant proportion of communicable diseases**
- Key characteristics:
  - High infectivity ?
  - Short incubation period
  - Rapid transmission

Common Epidemiological Features of Viral Diseases ?

- **High infectivity ?**
- **Epidemic and outbreak tendency ?**
- **Subclinical infections common ?**
  - Silent transmission
- **Carrier state in selected viral diseases ?**

- Seasonal variation (e.g., influenza)

Modes of Transmission ? (VERY IMPORTANT)

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1. Droplet Spread ?

- Spread via:
    - Coughing
    - Sneezing
- Example:
    - Influenza

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2. Airborne Transmission ?

- Small droplet nuclei remain suspended
- Example:
    - Measles

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3. Direct Contact ?

- Skin-to-skin contact
- Example:
    - Viral skin infections

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4. Indirect Contact (Fomites) ?

- Contaminated objects
- Example:
    - Respiratory viruses

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5. Feco-oral Transmission ?

- Contaminated food/water
- Example:
    - Poliovirus
    - Hepatitis A

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6. Vertical Transmission ?

- Mother ? fetus
- Example:
    - Rubella
    - HIV

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7. Zoonotic / Pandemic Transmission ?

- Animal ? human transmission
- Example:
    - Influenza strains

- COVID-19

Host Factors ?

General Host Factors ?

- **Age ?**
  - Children and elderly more vulnerable
- **Immunity ?**
  - Previous infection or vaccination
- **Nutritional Status ?**
  - Malnutrition increases susceptibility
- **Vaccination Status ?**
  - Unvaccinated individuals at higher risk
- **Pregnancy ?**
  - Increased risk of severe disease
- **Immunocompromised State ?**
  - Severe infections (HIV, transplant patients)

Prevention Principles Common to Viral Diseases ?

1. Breaking Transmission ?

- Isolation of cases
- Hand hygiene
- Mask use

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2. Environmental Measures ?

- Disinfection
- Ventilation

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3. Personal Protection ?

- Avoid crowding
- Respiratory hygiene

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4. Health Education ?

- Awareness of symptoms and prevention

Role of Immunization ? (VERY IMPORTANT)

- **Most effective preventive strategy ?**
- Provides:
    - Active immunity

    - Herd immunity

- Examples:
    - Measles vaccine
    - Polio vaccine
    - COVID-19 vaccine

Outbreak Potential & Surveillance Relevance ?

- Viral diseases:
    - **High outbreak potential ?**
- Need for:
    - **Early detection (surveillance) ?**
    - Notification systems
    - Rapid response

Key Public Health Actions ?

- Surveillance systems
- Isolation and quarantine
- Notification of cases
- Outbreak investigation

- Immunization campaigns

? Ultra High-Yield Points ?

- **Viruses = high infectivity + epidemic tendency ?**
- **Subclinical infection = important in spread ?**
- **Transmission = droplet + airborne + feco-oral ?**
- **Immunization = most effective prevention ?**
- **Surveillance = key for outbreak control ?**

Table: Common Viral Diseases and Mode of Transmission ?

DISEASE	MODE OF TRANSMISSION	KEY POINT
Influenza ?	Droplet	Seasonal outbreaks
Measles ?	Airborne	Highly infectious ?
Chickenpox (Varicella)	Airborne + contact	Vesicular rash
Polio ?	Feco-oral	Paralysis
Hepatitis A ?	Feco-oral	Food/water-borne

DISEASE	MODE OF TRANSMISSION	KEY POINT
Hepatitis B ?	Blood, sexual, vertical	Chronic infection
Rubella ?	Droplet	Congenital defects
COVID-19 ?	Droplet + airborne	Pandemic disease

Table: General Epidemiological Determinants of Viral Diseases ?

DETERMINANT	DETAILS
Agent Factors ?	Virulence, infectivity, antigenic variation
Host Factors ?	Age, immunity, nutrition, vaccination status
Environmental Factors ?	Climate, crowding, sanitation
Transmission Factors ?	Mode of spread (droplet, airborne, feco-oral)
Social Factors	Population density, travel, migration

Table: Childhood Viral Exanthems at a Glance ?

DISEASE	KEY FEATURE	RASH TYPE
Measles ?	Koplik spots, high fever	Maculopapular
Rubella ?	Mild fever, lymphadenopathy	Maculopapular
Chickenpox ?	Itchy vesicles	Vesicular
Roseola	High fever ? rash	Macular

DISEASE	KEY FEATURE	RASH TYPE
Erythema infectiosum	Slapped cheek appearance	Erythematous

Table: Vaccine-Preventable Viral Diseases in this Chapter ?

DISEASE	VACCINE AVAILABLE	PROGRAMME
Measles ?	Measles/MR vaccine	UIP
Rubella ?	MR vaccine	UIP
Polio ?	OPV/IPV	UIP
Hepatitis B ?	Hepatitis B vaccine	UIP
Japanese Encephalitis ?	JE vaccine	Endemic areas
COVID-19 ?	COVID vaccine	National programme

? High-Yield Points ?

- **Measles = most infectious viral disease ?**
- **Feco-oral = polio, hepatitis A ?**
- **Blood-borne = hepatitis B ?**
- **Vaccines = cornerstone of prevention ?**
- **Childhood exanthems = common exam topic ?**

Flowchart: Viral Transmission Routes ?

Source of infection (infected person / animal)
?
Shedding of virus
?
Modes of transmission

- Droplet spread ?
- Airborne spread ?
- Direct contact
- Indirect contact (fomites)
- Feco-oral route ?
- Vertical transmission ?
- Vector / zoonotic transmission

?
Entry into susceptible host
?
Viral infection ?

Flowchart: Susceptible Host ? Infection ? Immunity / Complications ?

Susceptible host ?
?
Exposure to virus
?
Entry into body

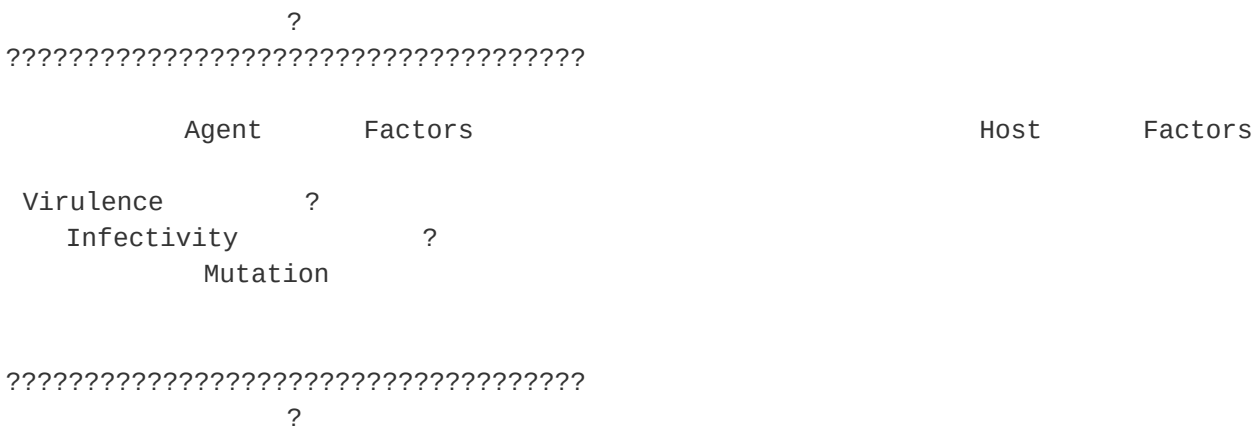
?
Viral replication
?
Clinical infection

?
Two possible outcomes

Path 1 ?
Recovery
?
Development of immunity ?

Path 2 ?
Severe disease
?
Complications
?
Disability / death ?

Figure: Common Determinants of Spread of Viral Diseases ?



? **Key Concept ?**

- Spread depends on:
  - **Agent + Host + Environment ?**

- Core epidemiological triad governs viral diseases