

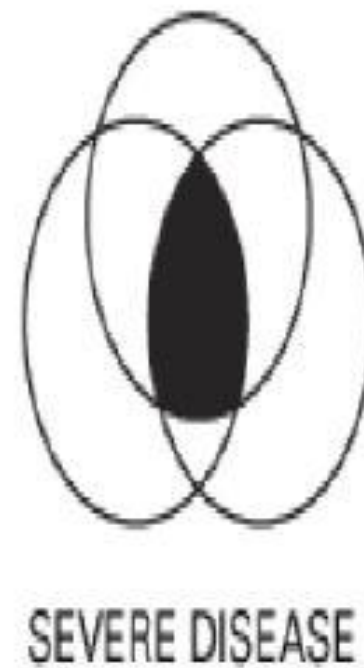
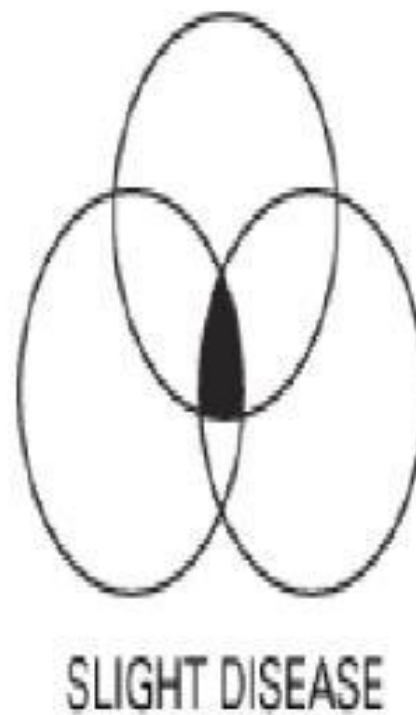
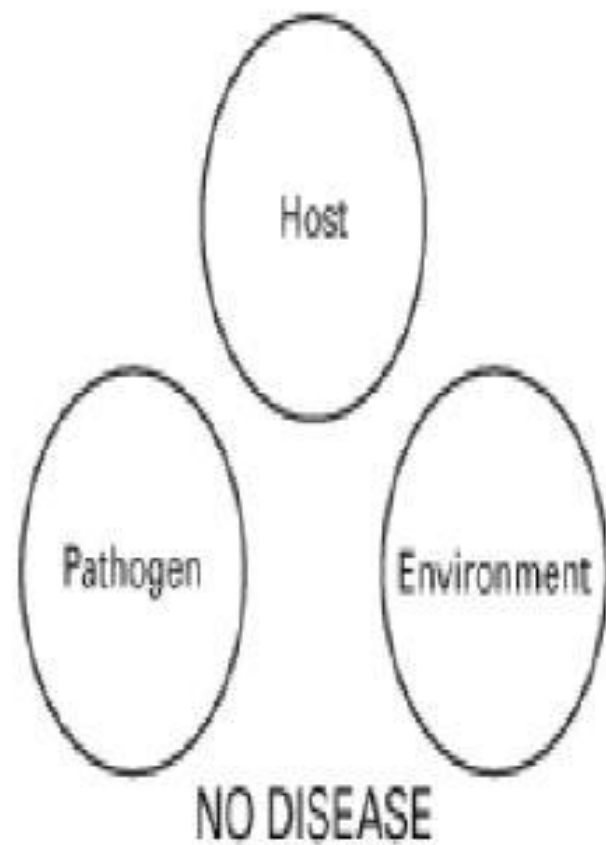
Disease development process

Three important components of disease development process

1. Susceptible host
2. Virulent pathogen
3. Favourable environment

Note: For disease to occur all three of these must be present

Disease Triangle



Properties of Pathogen

- Level of virulence
- Adaptability
- Dispersal efficiency
- Survival efficiency
- Reproductive fitness

Properties of Host

- Susceptibility
- Growth stage & form
- Population density & structure
- General health

Properties of Environment

- Temperature
- pH
- DO
- Nitrite
- Ammonia
- H₂S
- Salinity
- Organic load etc.

Stages in Disease Development

5 stages:

1. Inoculation
2. Penetration
3. Infection
4. Growth and Reproduction
5. Dissemination of Pathogen

1) Inoculation

❖ **Inoculation : The arrival of pathogen on the host**

❖ **Inoculum**

- **The pathogen (s) that land on the host or**
- **Any part of the pathogen that can initiate infection**

Types of inoculum

❖ **Primary inoculum**

- An inoculum that survives the dormant period & caused the first infections

❖ **Primary infections**

- Infection caused by primary inoculum

❖ **Secondary inoculum**

- An inoculum produced from primary infections

❖ **Secondary infections**

- Infection caused by secondary inoculum

2) Penetration

- ❖ **The initial invasion of a host by a pathogen:**
 - 1. Direct Penetration**
 - 2. Penetration Through Natural Openings**
 - 3. Penetration Through Wounds**

3) Infection

- ❖ **Establishment of pathogen with vulnerable cells or tissues of the host and obtain the nutrients from them**
 - ❖ **Successful infection will produce symptoms**
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- ❖ **Incubation period** : The time interval between inoculation and the appearance of disease symptoms.
 - ❖ **Latent infection** : The state in which a host is infected with a pathogen but does not show any symptoms.



4) Growth and Reproduction

- ❖ The pathogen will grow and multiply within the infected host.**
- ❖ Fungi – spores**
- ❖ Viruses – replicated by the cell**
- ❖ Nematodes – reproduce by means of eggs**

5. Dissemination of Pathogen

- By water
- Pathogens in the soil – dissemination by rain / irrigation water that moves on the surface / through soil.
- By Insects, Nematodes & other Vectors.
- By human -through handling of diseased fish.
- Transporting contaminated soil on their feet / equipment contaminated container.
- Using infected seed / nursery stock.