

Epidemiology . 3

- The starting point of communicable disease is :- Existence of source or reservoir.

Source of infection : The Person, animal, object from which an infection agent passes or disseminates to the host.

Reservoir : any person, animal, arthropod, plant, soil or combination of these in which infectious agent ^① live and multiply ^② depend on primarily for survival ^③ reproduce itself (can be transmitted to susceptible host)

(The reservoir is the natural habitat where the organism metabolize and replicate)

* Type of Reservoir :

① Human Reservoir :

- the most important source or reservoir of infection is the human
- may be case or carrier

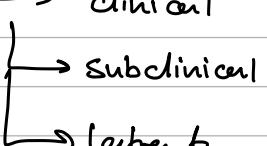
① **Cases** : Person that having the particular disease or health disorder under investigation.

→ identified by (clinical, biochemical, laboratory) criteria.

⇒ may be mild, moderate, severe, fatal
typical, atypical.

* The Presence of infection → may be

source of infection
(the agent is leaving the body
by vomiting, coughing, stools,
sneezing)



Note
mild cases more important
source of infection than severe
because the ambulant ones spread the
infection while severe is confined to bed

Subclinical : - unapparent, cover, missed, abortive cases

- the agent multiply in the host but doesn't manifest by signs and symptoms.

have a dominant role on maintain the chain of infection (endemicity) - the agent contaminates the environment (as clinical) (shed) - Transmit the infection more than symptomatic patient (clinical) - The person unknown to them self and others.

↳ detect only by laboratory test (organism · Ab response · biochemical)

- **Latent infection** : - doesn't shed the infectious agent
(lies dormant within the host)
 - without symptoms
 - without demonstrable presence in blood, tissue, body secretion) of the host
 - play great role in the perpetuation of certain infection.

Ex: latent infection in herpes simplex.

Primary Cases : 1st case of communicable disease introduced to population.

Index Cases : 1st case come to the attention of investigator (not always the primary)

Secondary Cases : cases developing from contact with Primary cases.

Suspect cases : individuals who have all the signs and symptoms of the disease, but yet hasn't been diagnosed with disease, or having the suspected Pathogen.

② **Carriers** : - an infected person or animal that harbours a specific infectious agent in the absence of clinical disease.

- they escape recognition
- serve as a source of infection
- carriers are less infectious than cases
- live normally among ~~and~~ but, they are more dangerous than cases

susceptible individuals over a wider area and longer period.

* The Element of the Carrier:

- ① Presence in the body of disease agent.
- ② absence of signs and symptoms.
- ③ shedding of disease agent (source of infection)

→ Carrier state result from : incomplete elimination of disease agent due to inadequate treatment or immune response.

Carriers classified according to

Type chronologically

- incubatory
- Convalescent
- Healthy

Duration

- Temporary
- Chronic

Portal of Exit

- urinary
- intestinal
- respiratory
- others

incubatory carriers

- shed the infectious agent during the [↑] incubation period
 - infecting others before onset of illness.
- ex: 1. mump 2. Polio 3. Pertussis 4. influenza
5. Diphtheria 6. HIV 7. HBU

last few days of

Convalescent Carriers

- shedding continue during the convalescence (period of recovery)
- the clinical recovery doesn't coincide with bacteriological recovery
- a serious threat to the unprotected household members
- This highlights the importance of bacteriological surveillance after clinical recovery.

- ex- 1. Typhoid Fever 2. dysentery cholera 3. Diphtheria
shed to [~] 4. Whooping Cough
(6-8) weeks

Contact Carrier

- infected persons like doctor or nurses usually with transient type.
- common in Cholera, Typhoid

Healthy Carriers

- emerge from subclinical case (subclinical infection without suffering from overt disease)
 - shedding the disease agent
- ex. 1. Poliomyelitis 2. meningococcal meningitis
3. salmonellosis 4. Diphtheria

Note: subclinical case may or may not be a carrier

- in Polio \rightarrow subclinical infection \rightarrow act as temporary carriers
- in TB \rightarrow with positive test \rightarrow no disseminate tubercle bacilli)

(every healthy carrier is subclinical case, but not every subclinical case is a carrier)

Transient carrier: Persons harbor and excrete the organism up to weeks

Temporary Carrier: - sheer for short period (<3 months)
- include incubatory, convalescent, healthy carriers.

Chronic Carrier: - excrete the infection for indefinite period (>3m, > year)
- duration of carrier state varies with the disease.
* in typhoid and HBV → last for several years

early detection to limit the spread.

- The longer the carrier state → the greater risk on community
- some carriers excrete intermittently and some continuously
- * Chronic carriers far more important source of infection than Cases

Permanent carrier: For life

Animal Reservoir

- animal can act as a reservoir whether diseased or carriers. (like: pigs, ducks)
* zoonosis: infectious agent transmissible under normal condition from vertebrate animal to man.

ex.

- 1. cattle in Bovine TB
- 2. Goats in Brucellosis
- 3. Dogs in Rabies
- 4. Rats in Plague
- 5. Mice, rodents, ducks and Cows in Salmonella
- 6. monkey in Yellow fever

Reservoir in non-living things: - soil and inanimate matters act as reservoir
ex. soil harbor agent of tetanus, anthrax.

⇒ Portal of exit → urinary, intestinal, respiratory, nasal skin eruption (open wound and blood)

* portal of exit and the occupational status → are important epidemiological consideration.

* in Typhoid Fever Carriers dangerous because:

- 1. They don't show any clinical manifestation.
- 2. The carrier and his contact are not aware
- 3. difficult to discover them
- 4. long period of carriage in some disease

→ model of exit of reservoir

① Alimentary canal

- in feces as in (Typhoid, Paratyphoid, cholera)

- in vomitus as in (cholera)

→ disease where the primary site of infection in bowel → organism will pass in feces (like: HAV, Polio affect CNS)

② Respiratory tract

- organism leave the body through mouth and nose
(coughing, sneezing, laughing, talking)

- ex: 1. whooping cough 2. Diphtheria
3. Streptococcal sore throat 4. influenza
5. common cold 6. mumps
7. meningococci

③ Urinary Tract: - occur in disease where infection is general and organism are found in Blood.

ex. Typhoid - Bilharziasis - genitourinary tract
Paratyphoid

④ Discharge from skin and mucous lesions:

- discharge from mucous membrane
as in Purulent conjunctivitis and venereal disease.

⑤ Insect Bites:

- mosquitoes → malaria
- Lice → Typhus
- Fleas → Plague

⑥ Syringes and taking blood from donors

- viral hepatitis

- AIDS

⑦ In-utero passage (transplacental)

AIDS, Syphilis, German measles