Community 432 Medicine

4 Natural history and spectrum of diseases

Objectives

1. **Describe natural history of diseases and their implications for public health.**
2. **Describe spectrum of diseases and their implications for public health.**

Done By:
Asma Al-Mohizea

Reviewed By:
Rozan Murshid

جامعة الملك سعود
King Saud University

I. Natural history:

Refers to the progress of a disease process in an ***individual*** over time, in the absence of intervention (1ry/2ry/3ry). This is usually done early on where we don't know anything about the disease or its management because if we do it's unethical to not intervene. Ex: When AIDs first broke out signs of fatal immunodeficiency were observed.

Natural history describes the course of the disease in an individual starting from the moment of **exposure** to the causal agents till one of the possible **outcomes** occurs.

Natural history phenomena:

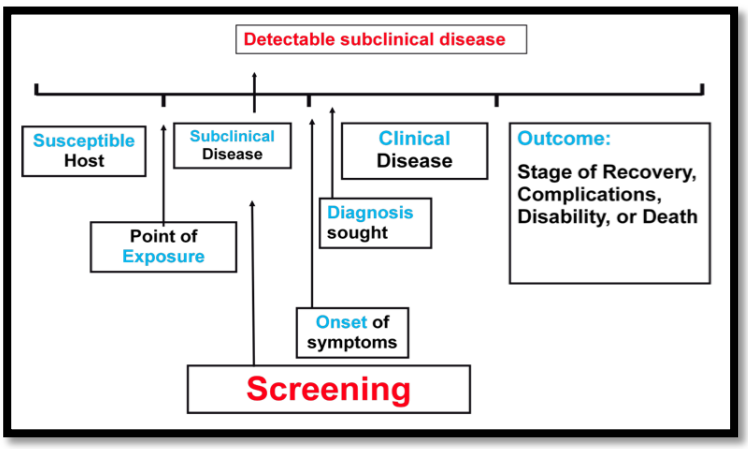
(A) Induction: time to disease initiation. Time between exposure to casual agent* and initiation of disease.

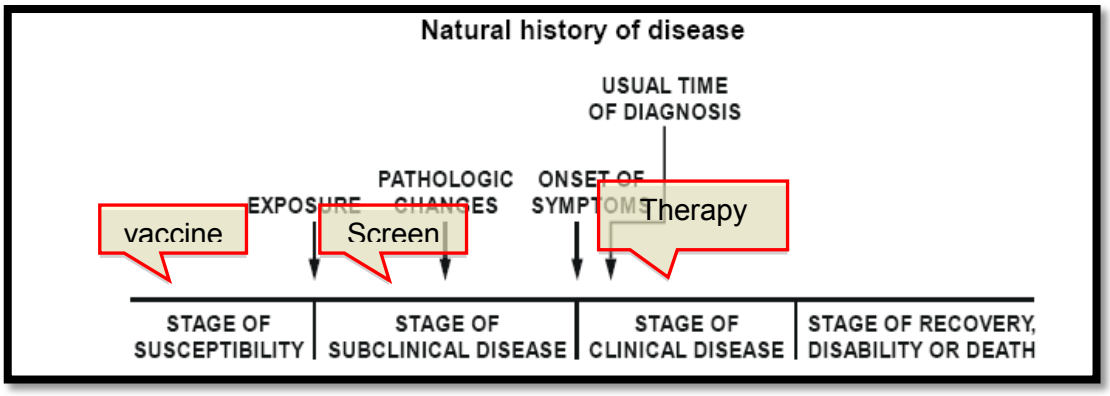
(B) Incubation: time to symptoms (infectious disease).

(C) Latency: time to detection (for non-infectious disease) or to infectiousness. Same as incubation but in non-communicable disease. Same to seeking medical care. Depending on awareness.

*Since the etiology of many diseases involves a combination of factors, each causal agent as having its own induction period.

Several important landmarks in natural history are the initiation of the disease itself (however we are defining it), the onset of symptoms, the point where a disease can be and/or is usually detected, and for communicable diseases, the point when the disease becomes transmissible.





Problems:

- The problem is that we might know about disease onset when symptoms occur but most likely we will only know about the disease when a person seeks care for the symptoms.
- In some situations an investigator will only become aware of a case after a diagnosis is made.

Importance of learning natural history:

- The understanding of this progression from disease onset to cure or death is important for epidemiologists.
- Natural history is as important as causal understanding for the prevention and control of disease.
- The earlier you can become aware of the attack the more likely you will be able to intervene and save lives.

Types of intervention:

Primary: Pre-emptive to susceptible hosts. (Vaccines.)

Secondary: After diagnosis with disease/risk factor. (Regular follow ups.)

Tertiary: Palliative (for example physiotherapy.)

Spectrum of disease:

The idea that an exposure can lead to varying signs, symptoms and severity of the same disease in the ***population*** is the spectrum of disease.

- Why do we have varying degrees of severity or outcome?
  Agent factors: duration of exposure. Host: Immunity. Environmental eg: Poorly ventilated rooms.
- The outcome will depend on the interactions of host, agent and environmental factors.

> ***For example**, atherosclerosis can result in a wide variety of clinical diseases. It can manifest as: coronary artery disease with symptoms of angina; peripheral artery disease that presents itself as intermittent claudications; cerebrovascular accidents.*
>
> ***Another example is** deep vein thrombosis and pulmonary embolism. Both sides of the same coin.*

Classification of disease according to severity (Spectrum of disease):

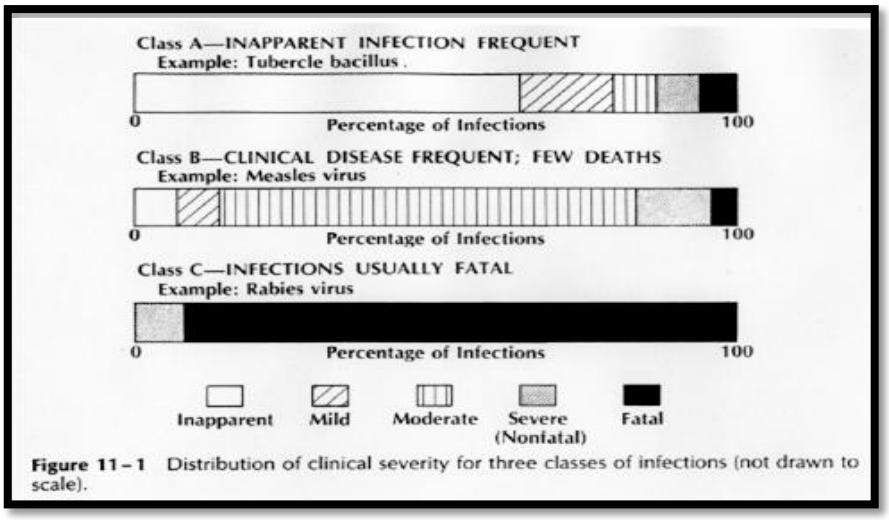


Figure 11–1 Distribution of clinical severity for three classes of infections (not drawn to scale).

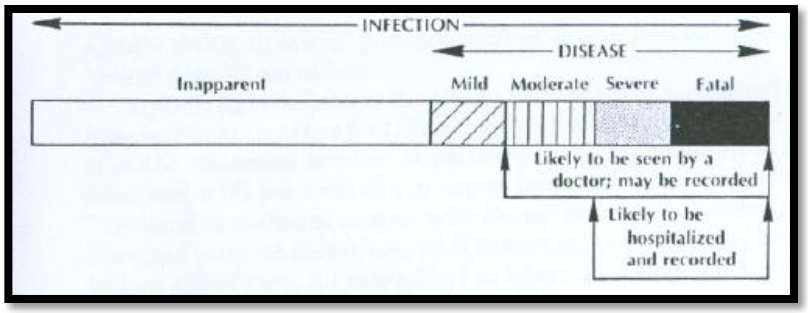
(A) Inapparent infection: Tuberculosis, Polio, Hepatitis A, Meningitis, AIDS*

(B) Classic case: Chickenpox, measles. Majority go to clinic.

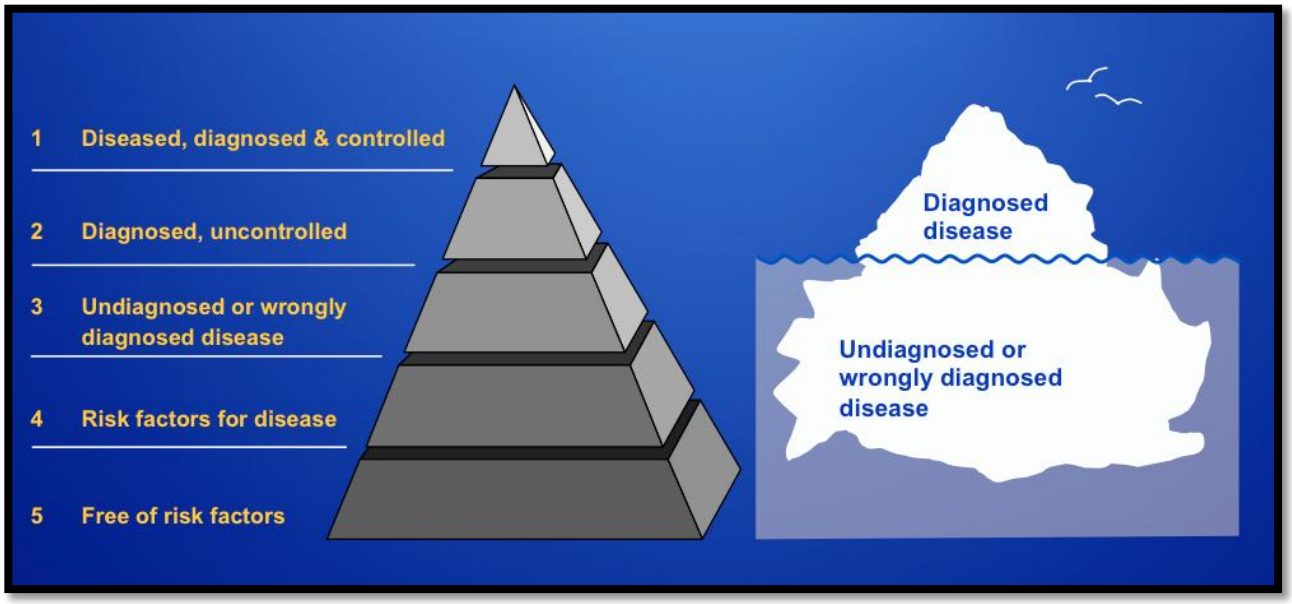
(C) Severe/fatal infection: Rabies, hemmorhagic fever caused by Ebola and Murberg viruses. Dengue fever, Pneumonic plague.

*Hx negative. How do we know if they're inapparent? By effective screening.

Q: Which class is of major public health importance? Class A. Because a large percentage can be subclinical and pass on undetected but infectious.



The relation of severity of illness to disease statistics



The pyramid and iceberg of disease:

- Cases of illness correctly diagnosed by clinicians in the community often represent only the "**tip of the iceberg**."
- Many additional cases may be too early to diagnose or may remain asymptomatic.
- Examples: Tuberculosis, meningitis, polio, hepatitis A, AIDS.
- **The risk** is that persons with in-apparent or undiagnosed infections may be **able to transmit** infection to others.

Implications of the concepts of natural history and spectrum of disease:

- Persons with in-apparent or undiagnosed infections can transmit infections to others.
- Control measures must be directed toward all infections capable of being transmitted to others;

-Both clinically apparent cases and

-Those with in-apparent or undiagnosed infections.

MCQs

Q1: Which of the following describes the progress of a disease in an individual over time, in the absence of any intervention:

A. Natural history of the disease

B. Spectrum of the disease

C. Subclinical stage of the disease

D. Disease pathogenicity

Answer A

Special thanks to the 430 community medicine team

Community medicine team leader :

Rozan Murshid

If you find any Mistakes please contact me:

Roza1066@gmail.com