

NATURAL HISTORY OF DISEASE DEVELOPMENT AND PREVENTION

LEARNING OBJECTIVES

- Describe the natural history of disease development
- Define the terms prevention, control, elimination and eradication
- Give examples of classes of diseases in relation to severity
- Explain the relation between disease severity and reporting
- Identify the level of prevention in relation to the natural history of disease development
- Identify the measures applied at each level of prevention

NATURAL HISTORY OF DISEASE

- It refers to the progress of a disease process in an individual over time, in the absence of intervention.
- It 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 PHENOMENON

- Induction Time to disease initiation
- Incubation Time to symptoms (infectious disease)
- Latency Time to detection (non-infectious diseases)

NATURAL HISTORY OF DISEASE AND LEVELS OF PREVENTION

		Stages of Pathogenesis			
Stage of Positive Health	Stages of Susceptibility (Pre Pathogenesis)	Asymptomatic (Early Pathogenesis)	Early, Discernible Disease	Full-Blown (Classical) Disease	Termination
<p>(A)</p> <p>(H) Well Balanced (E)</p> <p>Agent, Host and Environmental factors are in perfect balance</p>	<p>(A)</p> <p>(H) Dis Balanced (E)</p> <p>Balance between Agent, Host and Environmental Factors is disturbed; conditions have been created for disease process to start; however pathological processes have still not started.</p>	<p>Pathological process has started. However, outwardly, there are no signs or symptoms what so ever. Detection is only possible by specialized pathological / investigative studies.</p>	<p>There are very mild or non-specific signs / symptoms which occur at a very early stage of clinical course; not easy to detect at this stage unless very fine clinical acumen and / or specialized equipment is used.</p>	<p>Full fledged disease in classical form; quite easy to diagnose.</p>	<ul style="list-style-type: none"> - Complete Recovery - Chronic Disease - Life With Residual Disability - Death
Health Promotion	Specific Protection	Early Diagnosis and Prompt Treatment		Disability limitation	Rehabilitation
Primary Prevention		Secondary Prevention		Tertiary Prevention	
Levels of Prevention					

IMPORTANCE OF STUDYING THE NATURAL HISTORY OF DISEASES

- Understanding the progress from disease onset to final end point (cure or death) is important for epidemiologists.
- Knowledge of the natural history is necessary for the prevention and control of disease
- The intervention early in the course of the disease (asymptomatic stage) is likely to change the course of the disease favourably

CLASSES OF DISEASES IN RELATION TO CLINICAL SEVERITY (SPECTRUM OF DISEASE)



Class A- INAPPARENT INFECTION FREQUENT e.g. Tuberculosis, Poliomyelitis, Hepatitis A, Meningitis, HIV.AIDS



Class B- CLINICAL DISEASE FEQUENT WITH FEW DEATHS e.g. Measles, chicken pox



Class C- INFECTIOUS DISEASES USUALLY FATAL e.g. Rabies, hemorrhagic fevers caused by Ebola and muberg virus

Scale / legend



In-apparent
Zero

Mild

Moderate

Severe

Fatal

100

RELATION BETWEEN DISEASE SEVERITY AND STATISTICS

Scale/ legend

In-apparent
Zero

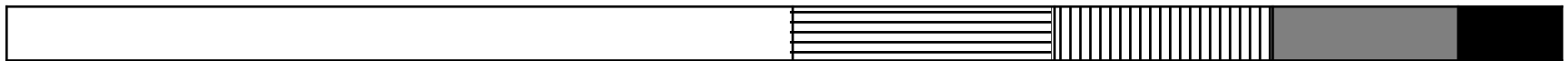
Mild

Moderate

Severe

Fatal

100



Likely to be seen by a doctor
and likely to be recorded

Likely to be
hospitalized and
recorded

PUBLIC HEALTH ASPECTS OF NATURAL HISTORY OF DISEASE AND DISEASE SEVERITY

- 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.

PREVENTION

Averting a disease or ill-health before its occurrence

Control of Communicable Diseases in Men, 2013

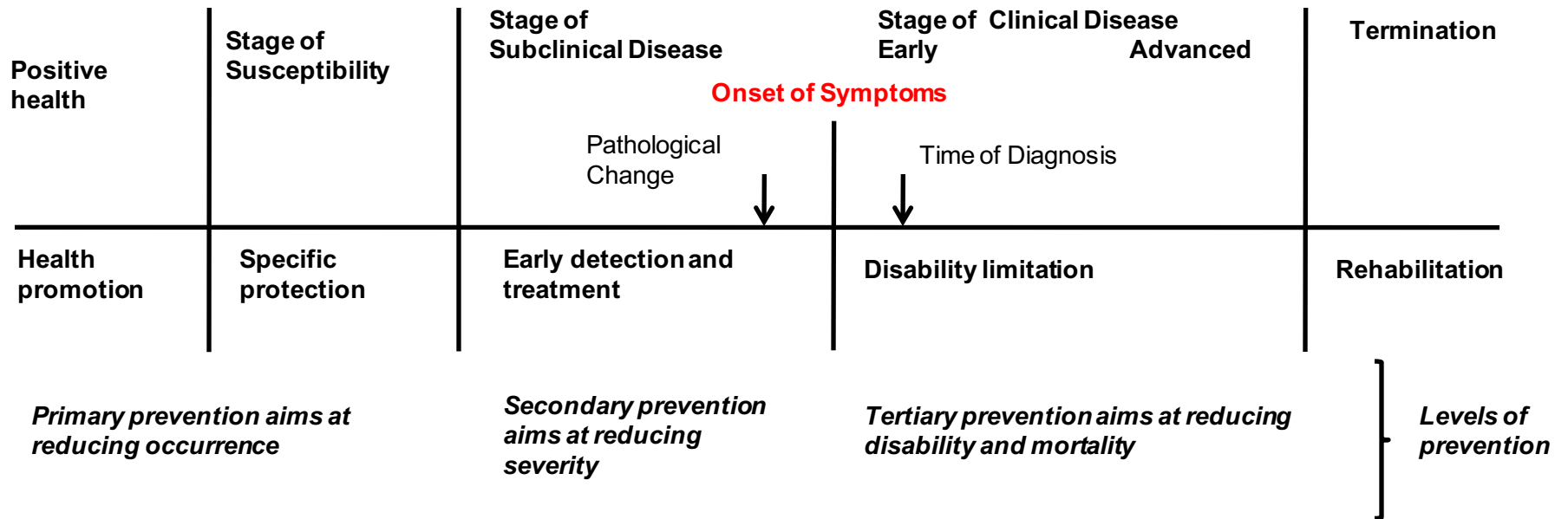
PREVENTION

Actions aiming at eradicating, eliminating, or minimizing the impact of disease and disability, or if none of these is feasible, retarding the progress of disease and disability.

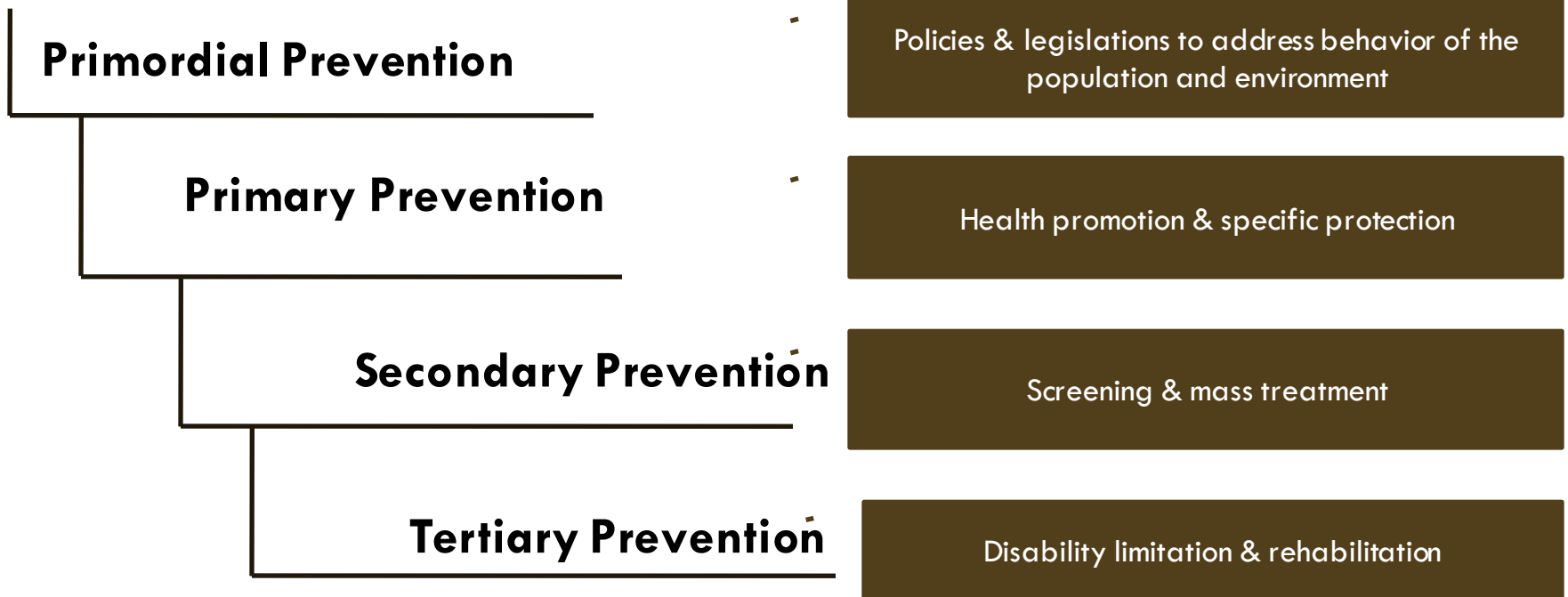
The concept of *prevention* is best defined in the context of *levels of prevention*; *primary, secondary, and tertiary prevention*.

Oxford Dictionary, 2008

NATURAL HISTORY OF DISEASE AND LEVELS OF PREVENTION



LEVELS OF PREVENTION



PRIMARY PREVENTION

□ HEALTH PROMOTION

- Health education
- Nutrition intervention
- Sanitation of the environment
- Life style modification

□ SPECIFIC PROTECTION

- Immunization
- Chemoprophylaxis
- Specific micronutrient
- Protection from unintentional injuries
- Protection from environmental hazards

DISABILITY LIMITATION & REHABILITATION

- Disability limitation ===== Prevent progress
- Rehabilitation ===== Attain highest level of functional abilities
 - Medical rehabilitation
 - Vocational rehabilitation
 - Social rehabilitation
 - Psychological rehabilitation

REFERENCES

- Principles of Epidemiology in Public Health Practice. Third Edition. An Introduction to Applied Epidemiology and Biostatistics. Centers for Disease Control and Prevention (CDC)
- Gordis L. Epidemiology. 2009