

Preventive Medicine

Dr. Madhuri D. Pandole

Assistant Professor,

Depat. of Pharmacology & Pharmacy Practice

Saraswati Institute of Pharmaceutical Sciences

Epidemiology

- “the study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the prevention and control of health problems”
(BONITA 2006)

Prevention of disease

- The outcome of any investigation on risk is to determine what can be done to reduce health risks within populations

Prevention of disease

- The decline in death rates that occurred during the 19th century in high-income countries was principally due to a decrease in deaths from infectious disease.
- Most of the decline in mortality took place before specific disease prevention interventions and has been attributed to *improvements in nutrition, housing, sanitation* and other environmental health

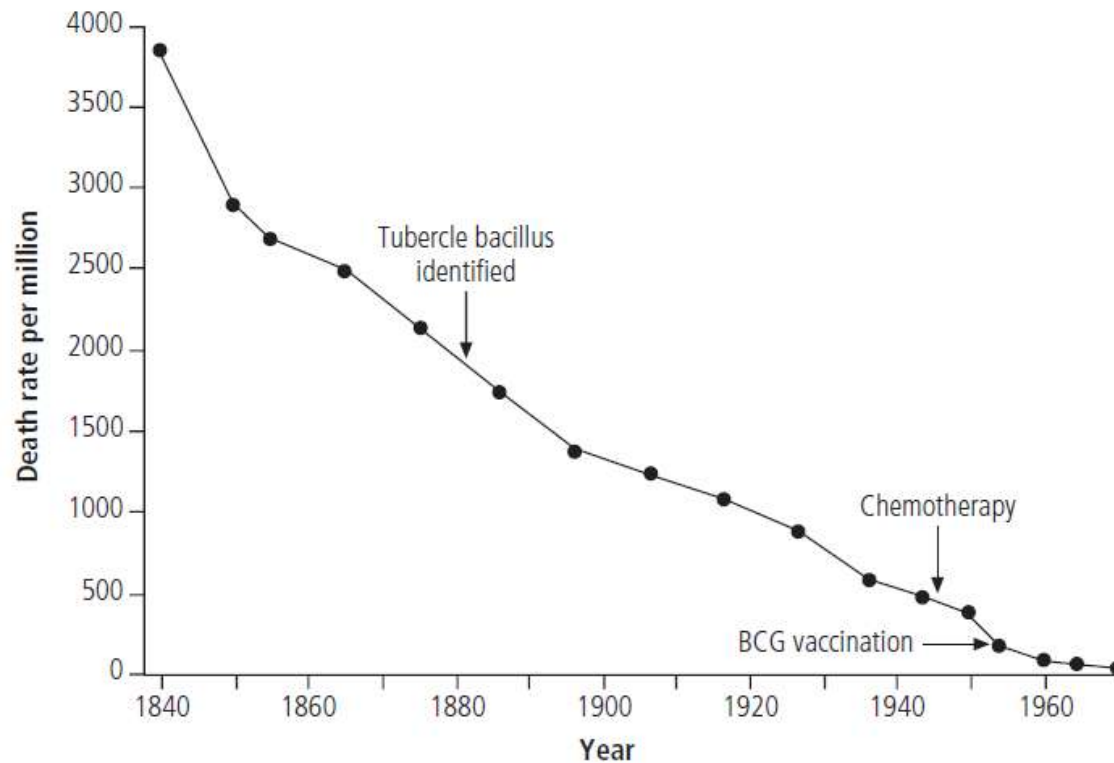
Prevention of disease

- In the 20th century, the declines in death rates from cardiovascular disease have accelerated in high-income countries.
- These gains have been the result of a wide range of measures directed at both whole populations and individuals

Preventive potential

- Major causes of disease are preventable.

Figure 6.1. Age-standardized death rates from tuberculosis in England and Wales, 1840–1968¹



Social determinants of health

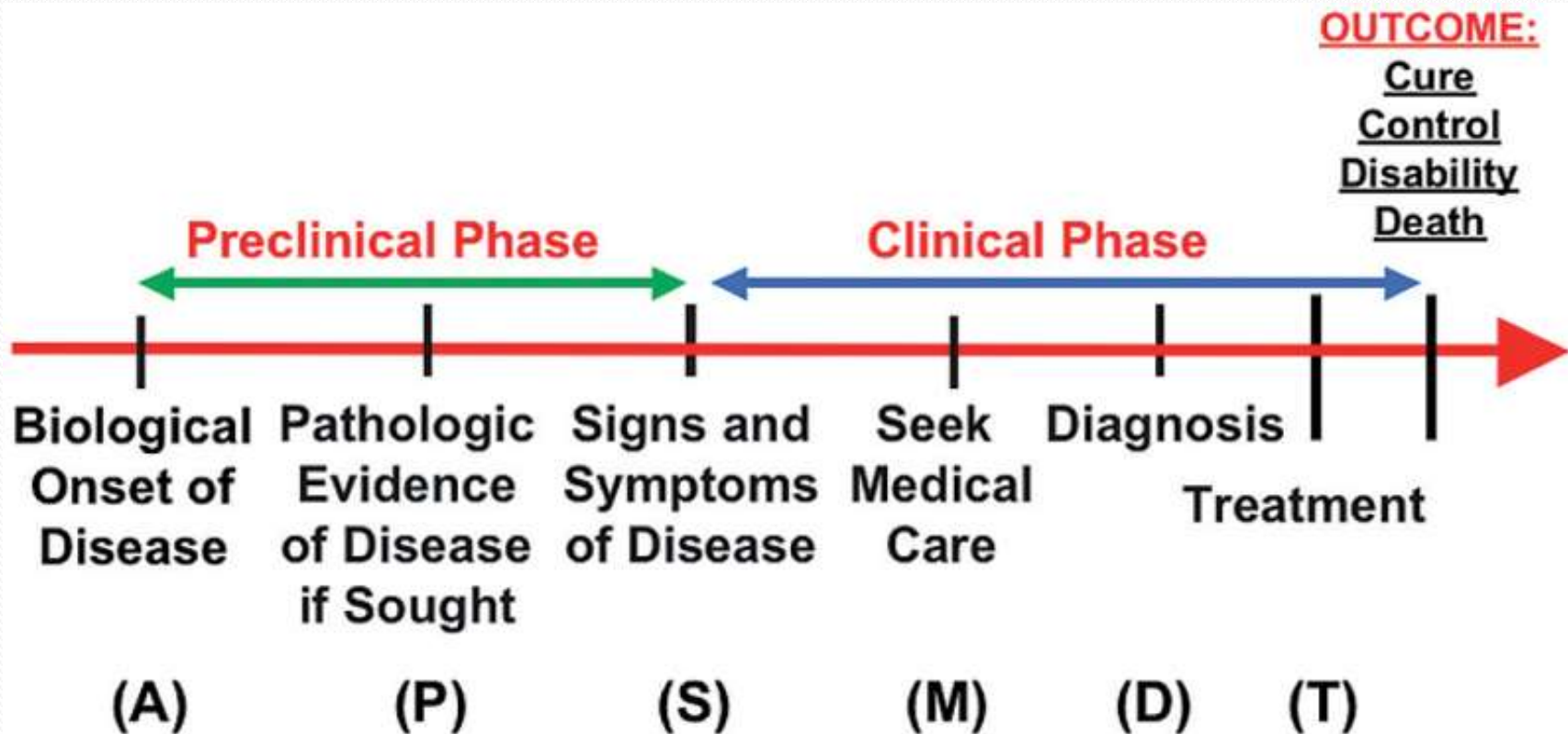
- Conditions in which people live and work.
- Addressing the social determinants of health is the fairest way to improve health for all people.
- Good medical care is vital, but the factors that can undermine people's health – such as *social position, housing conditions and occupational risks* – need to be addressed

Who should practice preventive Medicine?

- Public health nurses, medical sociologists, psychologists, health economists, sanitary engineers, pollution control experts and occupational hygienists are all involved in disease-prevention efforts.
- All people!!!!!!!!!!!!

Levels of prevention

- Four levels
- Each level targets conditions which have an established role in causing disease.
- Approaches to prevention overlap and merge
- Primordial and primary prevention contribute most to the health of the whole population
- Secondary and tertiary prevention are generally focused on people who already have signs of disease



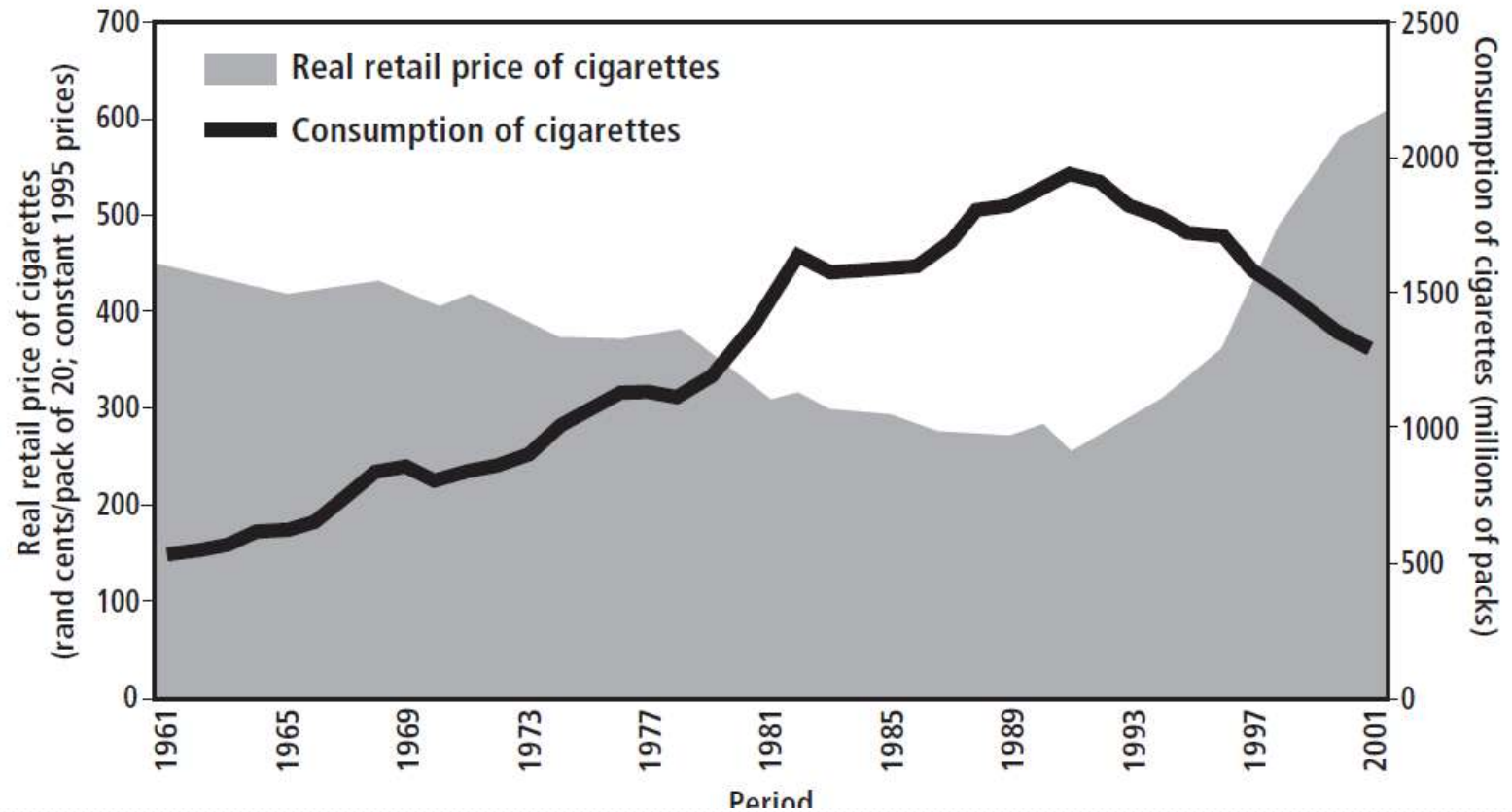
Gordis: Epidemiology, 4th Edition.

Copyright © 2008 by Saunders, an imprint of Elsevier, Inc. All rights reserved

Primordial prevention

- Avoid the emergence and establishment of *the social, economic and cultural* patterns of living that are known to contribute to an elevated risk of disease.


Figure 6.5. Inverse relation between real price of cigarettes and cigarette consumption, South Africa, 1961–2001³



Level	Phase of disease	Aim	Actions	Target
Primordial	Underlying economic, social, and environmental conditions leading to causation	Establish and maintain conditions that minimize hazards to health	Measures that inhibit the emergence of environmental, economic, social and behavioural conditions.	Total population or selected groups; achieved through public health policy and health promotion.

Primary prevention

- To limit the incidence of disease by controlling specific causes and risk factors at:
 - The whole population with the aim of reducing average risk (the population or “mass” strategy)
 - People at high risk as a result of particular exposures (the high-risk-individual




Level	Phase of disease	Aim	Actions	Target
Primary	Specific causal factors	Reduce the incidence of disease	Protection of health by personal and communal efforts, such as enhancing nutritional status, providing immunizations, and eliminating environmental risks.	Total population, selected groups and individuals at high risk; achieved through public health programmes

Table 6.2. Advantages and disadvantages of primary prevention strategies^{18, 22}

Feature	Population strategy	High-risk-individual strategy
Advantages	<ul style="list-style-type: none"> Radical Large potential for whole population Behaviourally appropriate 	<ul style="list-style-type: none"> Appropriate for individuals Subject motivation Physician motivation Favourable benefit-to-risk ratio
Disadvantages	<ul style="list-style-type: none"> Small benefit to individuals Poor motivation of subjects Poor motivation of physicians Benefit-to-risk ratio may be low 	<ul style="list-style-type: none"> Difficulties in identifying high-risk individuals Temporary effect Limited effect Behaviourally appropriate

Secondary prevention

- To reduce the more serious consequences of disease through early diagnosis and treatment
- Between the onset of disease and the normal time of diagnosis



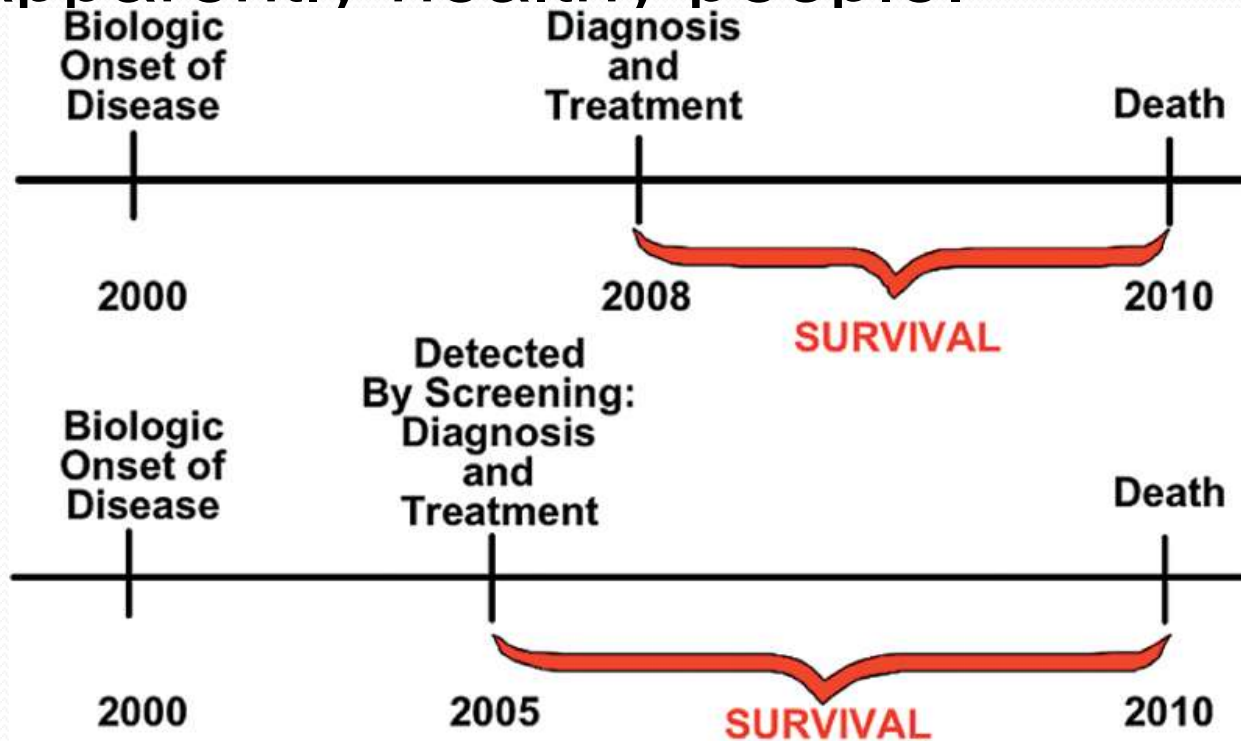
Level	Phase of disease	Aim	Actions	Target
Secondary	Early stage of disease	Reduce the prevalence of disease by shortening its duration	Measures available to individuals and communities for early detection and prompt intervention to control disease and minimize disability (e.g. through screening programs).	Individuals with established disease; achieved through early diagnosis and treatment.

Requirements for secondary prevention

- The two main requirements for a useful secondary prevention programme are:
 - Safe and accurate method of detecting the disease
 - Effective methods of intervention.

Screening

- The process of using tests on a large scale to identify the presence of disease in apparently healthy people.



Types of screening

- Mass screening = for the whole population (or subset)
- Multiple or multiphasic screening uses several screening tests at the same time
- Targeted screening of groups with specific exposures
- Case-finding or opportunistic screening = at

Criteria for screening

Table 6.4. Requirements for instituting a medical screening programme

Disorder	Well-defined
Prevalence	Known
Natural history	Long period between first signs and overt disease; medically important disorder for which there is an effective remedy
Test choice	Simple and safe
Test performance	Distributions of test values in affected and unaffected individuals known
Financial	Cost-effective
Facilities	Available or easily provided
Acceptability	Procedures following a positive result are generally agreed upon and acceptable to both the screening authorities and to those screened.
Equity	Equity of access to screening services; effective, acceptable and safe treatment available

Screening tests: match the columns

Table 6.5. Validity of a screening test

		Disease status		
		Present	Absent	Total
Screening test	Positive	a	b	$a+b$
	Negative	c	d	$c+d$
	Total	$a+c$	$b+d$	$a+b+c+d$

Sensitivity

Specificity

Positive predictive value

Negative predictive value

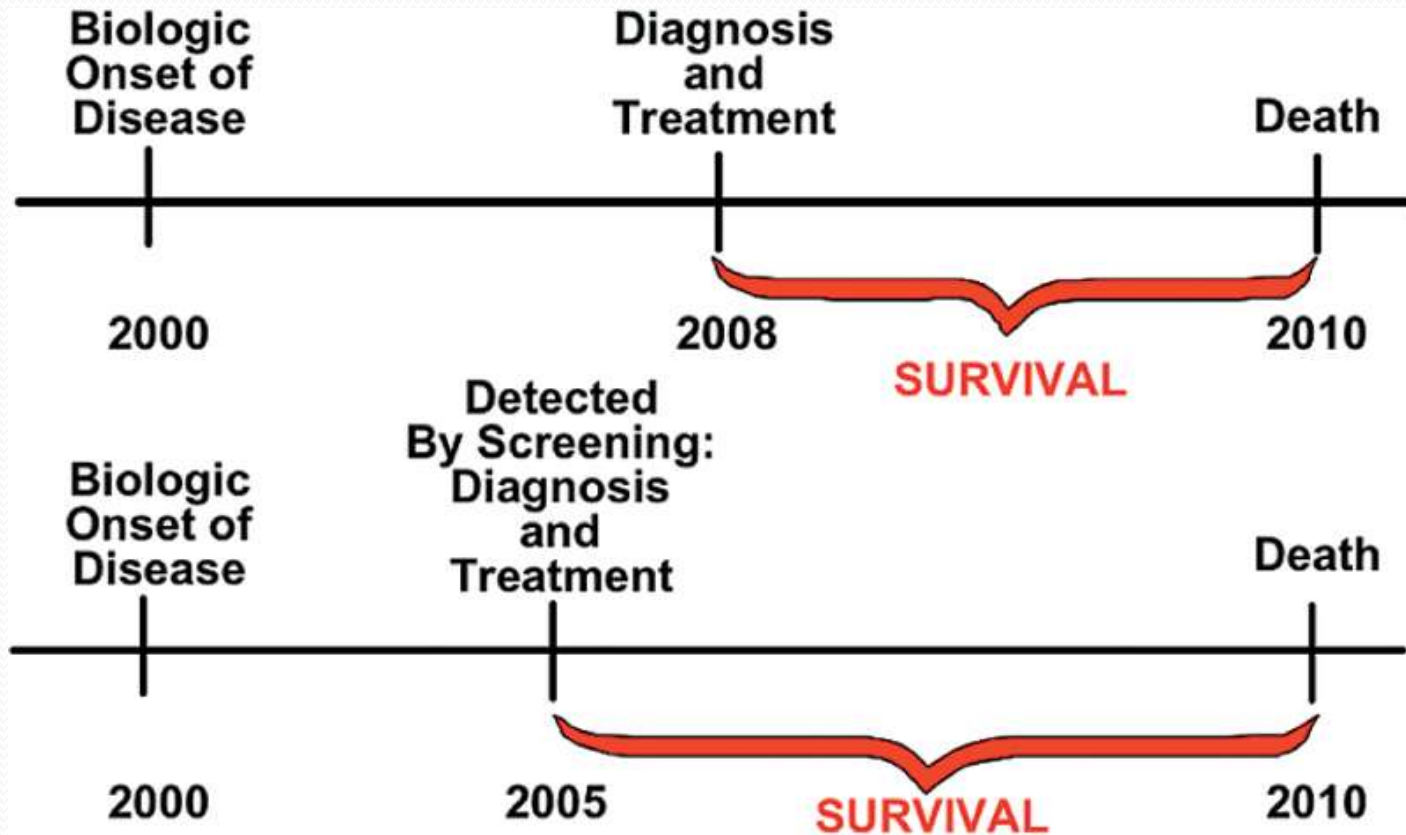
$$d/(c+d)$$

$$a/(a+c)$$

$$a/(a+b)$$

$$d/(b+d)$$

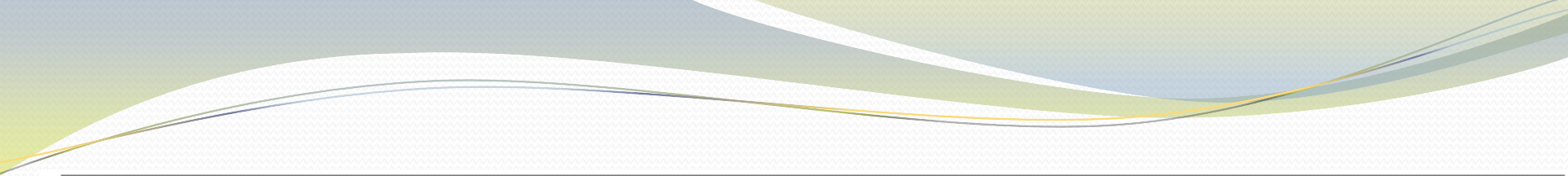
Length Bias



Gordis: Epidemiology, 4th Edition.
Copyright © 2008 by Saunders, an imprint of Elsevier, Inc. All rights reserved

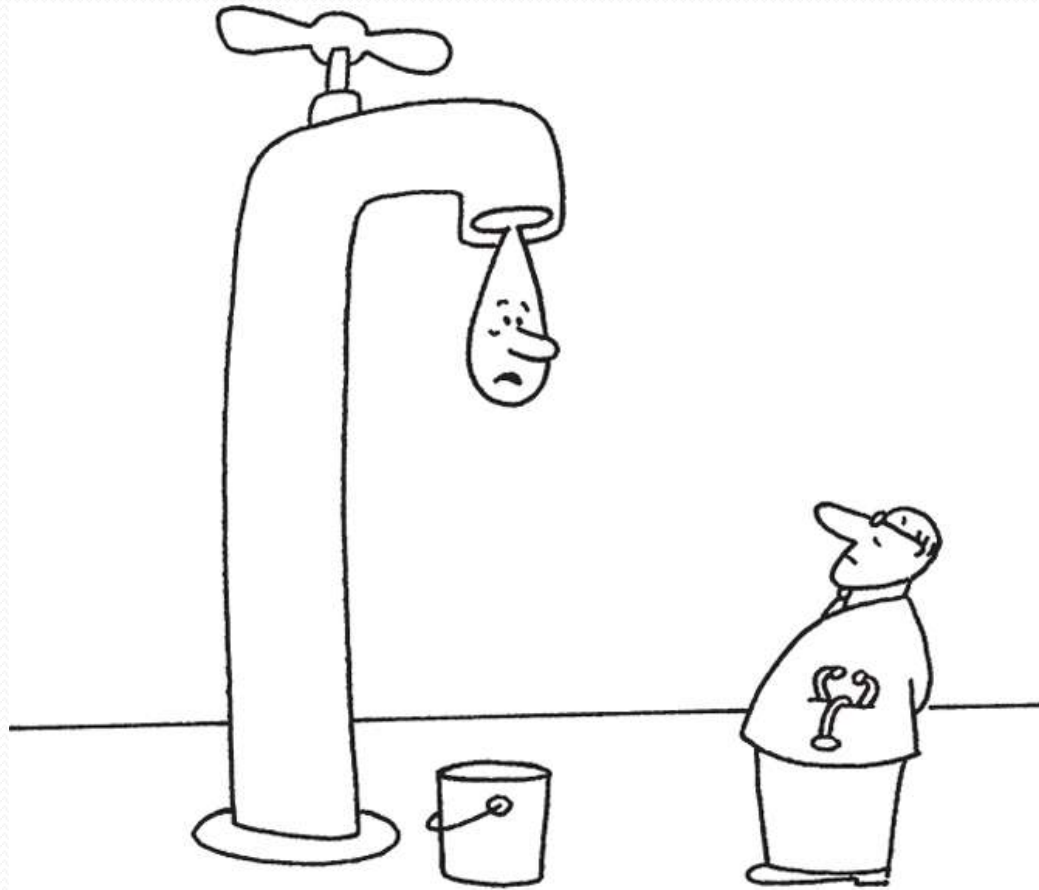
Tertiary prevention

- To reduce the progress or complications of established disease
- Important aspect of therapeutic and rehabilitation medicine.
- Consists of the measures intended to reduce impairments and disabilities, minimize suffering caused by poor health and promote patients' adjustment to



Level	Phase of disease	Aim	Actions	Target
Tertiary	Late stage of disease (treatment, rehabilitation)	Reduce the number and/or impact of complications	Measures aimed at softening the impact of long-term disease and disability; minimizing suffering; maximizing potential years of useful life.	Patients; achieved through rehabilitation.

Thank you



C. Barvetti

"How much time do I have, Doc?"

Gordis: Epidemiology, 4th Edition.

Copyright © 2008 by Saunders, an imprint of Elsevier, Inc. All rights reserved