Chapter 6

Health Policy and management

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6.2. Prevention strategies

6.2.1. Definition and Concept

The goals of medicine are to promote health, to preserve health, to restore health when it is impaired, and to minimize suffering and distress. These goals are embodied in the word prevention. Prevention consists of actions aimed at eradicating, eliminating or minimizing the impact of disease and disability, or if none of these are feasible, retarding the progress of the disease and disability. The concept of prevention is best defined in the context of levels, traditionally called primary, secondary and tertiary prevention.

6.2.2. Determinants of Prevention

There are basically five determinants that influence health as seen below. The area of the circle shows the magnitude of their impact on health:

- Economic, cultural and environmental conditions
- Living and working conditions
- Social and community networks
- Lifestyle choices
- Age, sex and hereditary factors

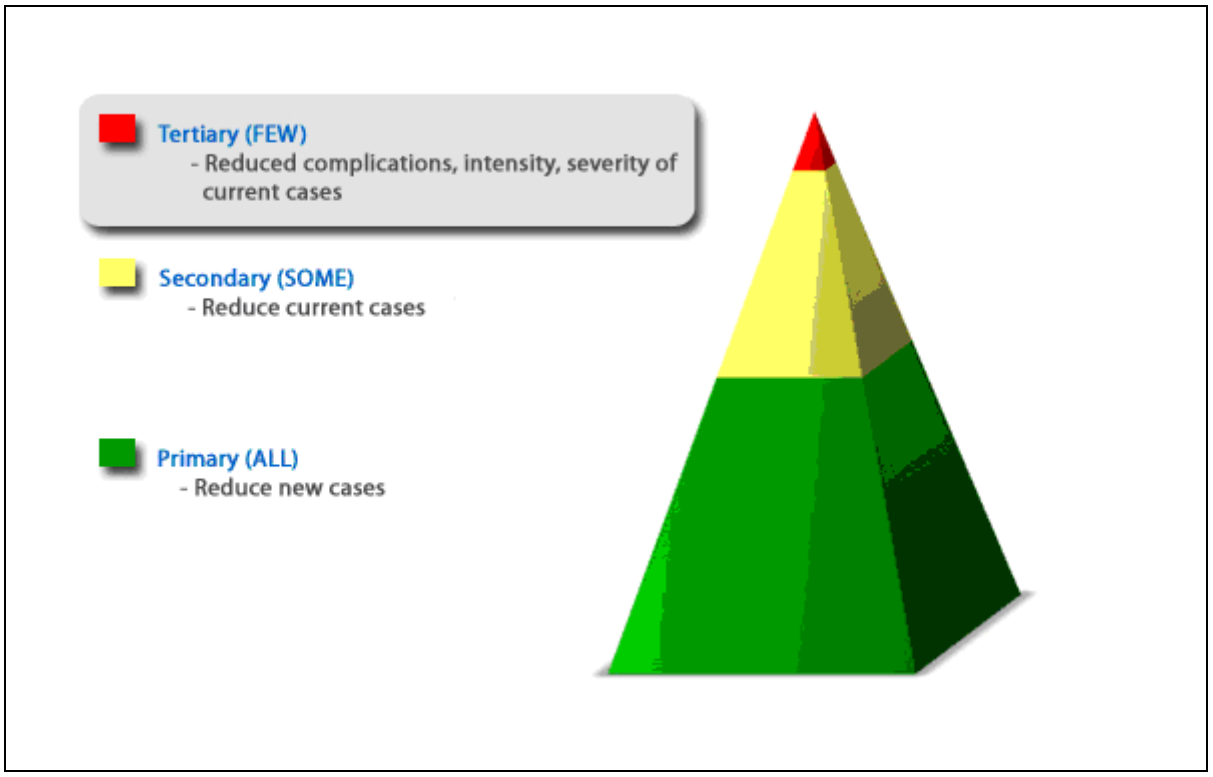
Successful prevention depends upon:

- a knowledge of causation,
- dynamics of transmission,
- identification of risk factors and risk groups,
- availability of prophylactic or early detection and treatment measures,
- an organization for applying these measures to appropriate persons or groups, and
- continuous evaluation of and development of procedures applied

6.2.3. The Three Levels of Prevention

The measures of prevention can be grouped into three levels:

- primary,
- secondary, and
- tertiary prevention.



6.2.4. Primary Prevention

Primary prevention is used before the onset of a disease. It aims to prevent the disease from occurring. It is an intervention in the pre-pathogenesis phase of a disease or health problem. So primary prevention reduces primarily the incidence of a disease, but by doing so, prevalence decreases as well. Primary prevention may be accomplished by measures of *health promotion* and *specific protection*.

Health promotion
Health promotion is the process of enabling people to increase control over the determinants of health and thereby improve their health.

The main areas of health promotion include:

- Health education
- Environmental modification
- Nutritional interventions
- Lifestyle and behavioral changes

Specific protection
Specific protection basically means preventive measure taken against specific diseases. The main possibilities are:

- Immunization and seroprophylaxis
- Chemoprophylaxis
- Use of specific nutrients or supplementation
- Protection against occupational hazards
- Safety drugs and food
- Control of environmental hazards

Approaches of Primary Prevention

The WHO has recommended the following approaches for the primary prevention of chronic diseases where the risk factors are established:

- *Population (mass) strategy* is directed at the whole population irrespective of individual risk levels. For example, studies have shown that even a small reduction in the average blood pressure or serum cholesterol of a population would produce a large reduction in the incidence of cardiovascular disease The population approach is directed towards socio-economic, behavioral and lifestyle changes.
- *High-risk strategy:* aims to bring preventive care to individuals at special risk. This requires detection of individuals at high risk by the optimum use of clinical methods.

6.2.5. Secondary Prevention

Secondary prevention is used

- after the disease has occurred, *but*
- before the person notices the symptoms.

It is defined as an action which halts the progress of a disease at its incipient stage and prevents complications. Secondary prevention primarily decreases prevalence. The specific interventions of secondary prevention are:

- *early diagnosis* (e.g. screening tests and case finding programs) and
- adequate *treatment*.

Secondary prevention attempts to arrest the disease process, restore health by seeking out unrecognized disease and treating it before irreversible pathological changes take place, and reverse communicability of infectious diseases. In case of infectious diseases it protects others in the community from acquiring the infection and provides at once secondary prevention for the infected ones and primary prevention for their potential contacts.

Early diagnose: the WHO Expert Committee in 1973 defined early detection of health disorders as the detection of disturbances of homoeostatic and compensatory mechanism while biochemical, morphological and functional changes are still reversible. The earlier the disease is diagnosed and treated, the better it is for prognosis of the case and in the prevention of the occurrence of other secondary cases.

Screening: in medicine, is a strategy used in a population to identify an unrecognized disease in individuals without signs or symptoms. This can include individuals with pre-symptomatic or unrecognized symptomatic disease. As such, screening tests are somewhat unique in that they are performed on persons apparently in good health.

Screening interventions are designed to identify diseases in a community early, thus enabling earlier intervention and management in the hope to reduce mortality and suffering from a disease. Although screening may lead to an earlier diagnosis, not all screening tests have been shown to benefit the person being screened; over-diagnosis, misdiagnosis, and creating a false sense of security are some potential adverse effects of screening. For these reasons, a test used in a screening program, especially for a disease with low incidence, must have good sensitivity in addition to acceptable specificity.

Types of screening

- Mass screening: Mass screening means the screening of a whole population or a subgroup. It is offered to all, irrespective of the risk status of the individual.
- High risk or selective screening: High risk screening is conducted among risk populations only.

- Multiphase screening: It is the application of two or more screening tests to a large population at one time instead of carrying out separate screening tests for single diseases.

6.2.6. Tertiary Prevention

Tertiary prevention targets the person who already has symptoms of the disease. The goals of tertiary prevention are:

- prevent damage and pain from the disease
- slow down the disease
- prevent complications
- give better care to people with the disease
- make people with the disease healthy again and able to do what they used to do

Tertiary prevention is used when the disease process has advanced beyond its early stages. It is defined as all the measures available to reduce or limit impairments and disabilities, and to promote the patients' adjustment to irremediable conditions. Intervention that should be accomplished in the stage of tertiary prevention is *disability limitation* and *rehabilitation*.

Disease limitation

A disease in general may have various adverse effects on an individual, and may lead to impairment, disability and handicap. The different types of effects differ in severity. By proper measurements progression can be halted.

Impairment is any loss or abnormality of psychological, physiological or anatomical structure or function.

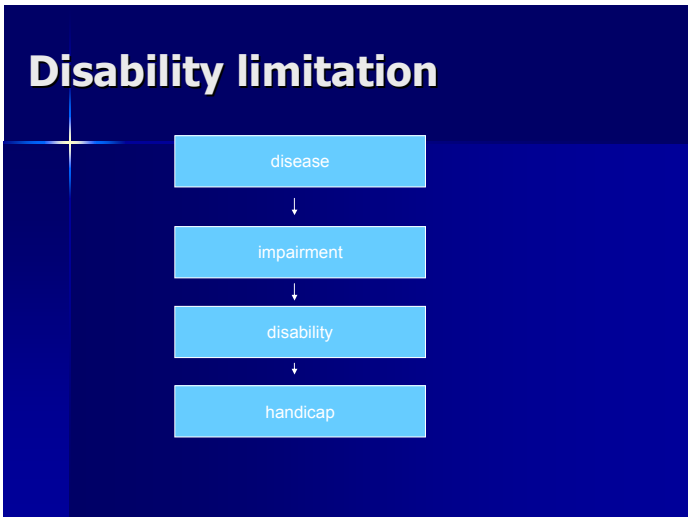
Disability is any restriction or lack of ability to perform an activity in the manner or within the range considered normal for the human being.

Handicap is termed as a disadvantage for a given individual, resulting from an impairment or disability that limits or prevents the fulfillment of a role in the community that is normal (depending on age, sex, and social and cultural factors) for that individual.

Rehabilitation

Rehabilitation is the combined and coordinated use of medical, social, educational, and vocational measures for training and retraining the individual to the highest possible level of functional ability.

Rehabilitation may include:

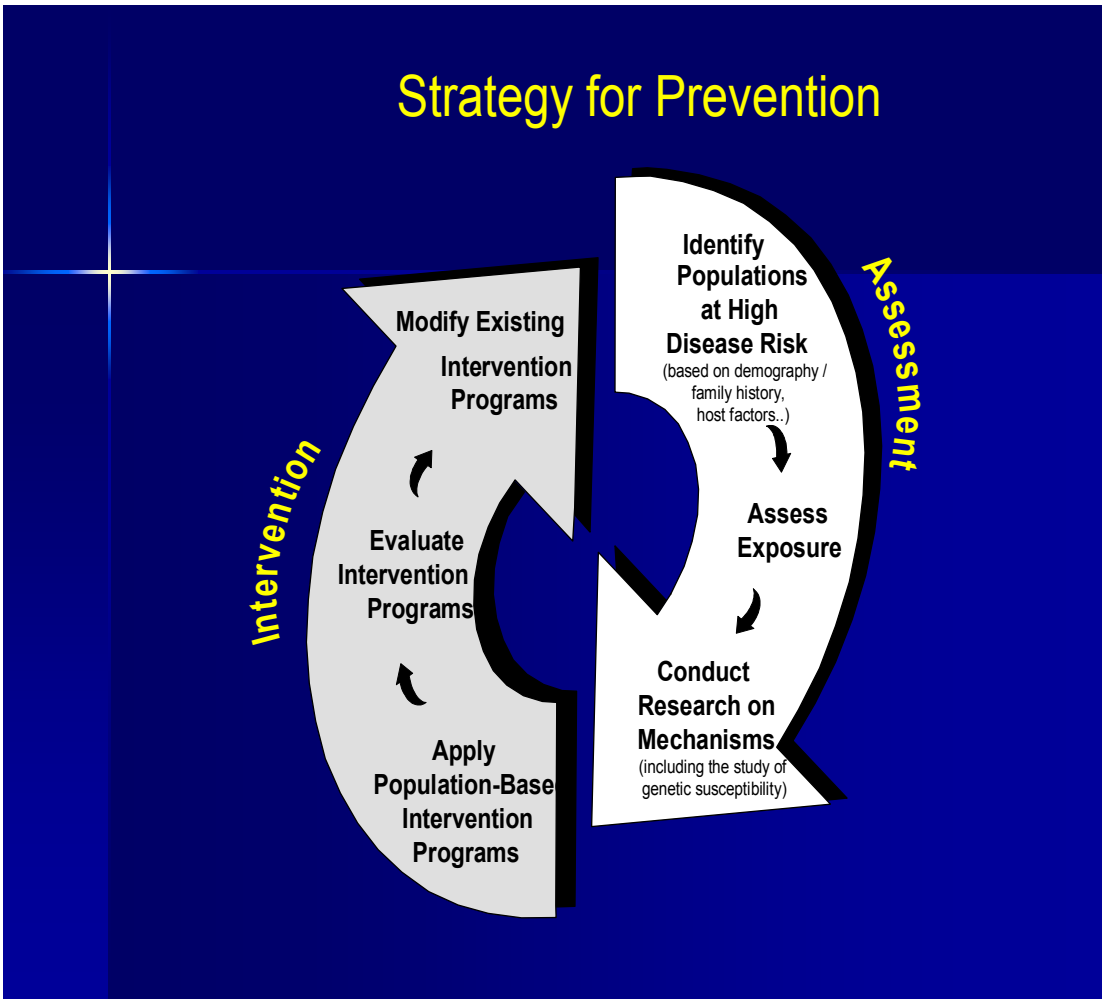


- Medical rehabilitation
- Vocational rehabilitation
- Social rehabilitation
- Psychological rehabilitation

6.2.7. The basics of prevention strategies

The prevention cycle summarizes how a given disease is eliminated or eradicated from a population. The process basically starts with assessment, only after is a given intervention imple-

mented. An intervention is successful if the prevalence of the disease decreases when the evaluation takes place.



Concept of control: The term disease control describes ongoing operations aimed at reducing the:

- incidence of disease
- duration of disease and consequently the risk of transmission
- effects of infection, including both the physical and psychosocial complications
- financial burden to the community.

Control activities focus on primary prevention or secondary prevention, but most programs combine both. The three basic goals of disease control are:

1) Control
2) Elimination: The term is used to describe interruption of transmission of disease, as for example, elimination of measles, polio and diphtheria from large geographic regions or areas
3) Eradication is the process of terminating all transmission of infection by extermination of the infectious agent through surveillance and containment. To date, only one disease has been eradicated, that is smallpox.

Concept of monitoring: is the performance and analysis of routine measurements aimed at detecting changes in the environment or health status of population. It also refers to on-going

measurement of performance of a health service or a health professional, or of the extent to which patients comply with or adhere to advice from health professionals.

Surveillance: is defined as the continuous scrutiny (inspection) of the factors that determine the occurrence and distribution of diseases and other conditions of ill-health.
The main objectives of surveillance are:

- to provide information about new and changing trends in the health status of a population (e.g., morbidity, mortality, nutritional status or other indicators and environmental hazards, health practices and other factors that may affect health),
- to provide feed-back which may be expected to modify the policy and the system itself and lead to redefinition of objectives, and
- provide timely warning of public health disasters so that interventions can be mobilized.

Evaluation of control: is the process by which results are compared with the intended objectives, or more simply the assessment of how well a program is performing. Evaluation should always be considered during the planning and implementation stages of a program or activity. Evaluation may be crucial in identifying the health benefits derived (impact on morbidity, mortality, patient satisfaction). It can be useful indentifying performance difficulties. Evaluation studies may also be carried out to generate information for other purposes (e.g., to attract attention to a problem, extension of control activities, training and patient management, etc.).

6.2.8. The focus of preventive medicine

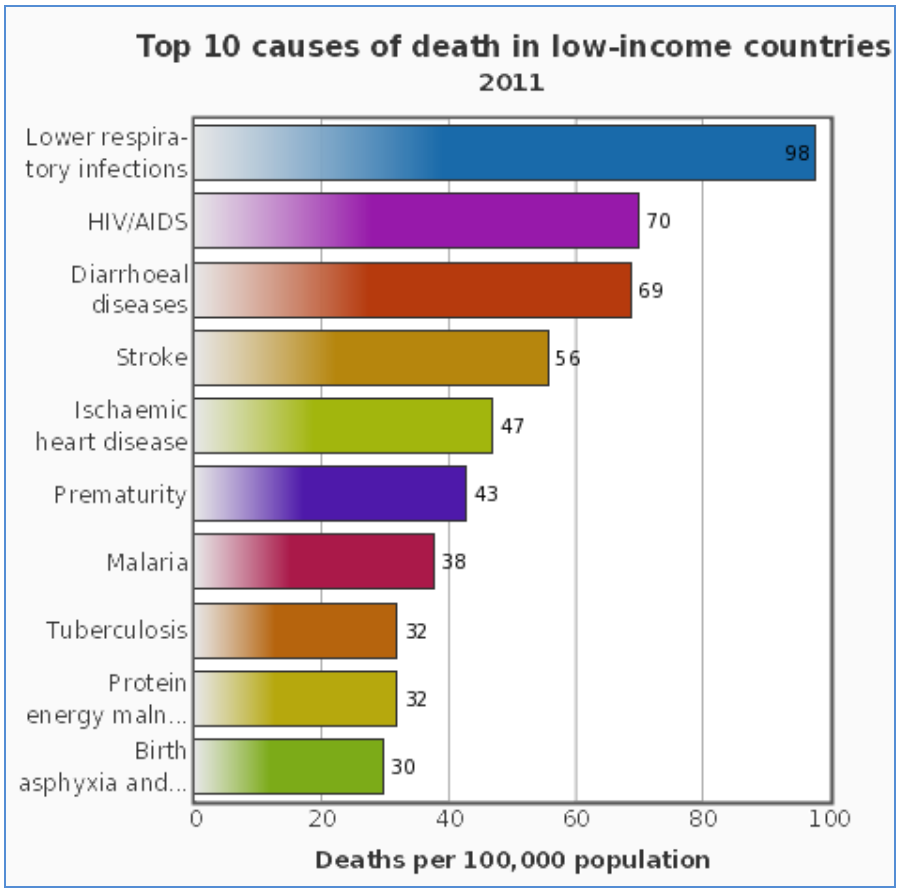
The leading causes of death worldwide are:

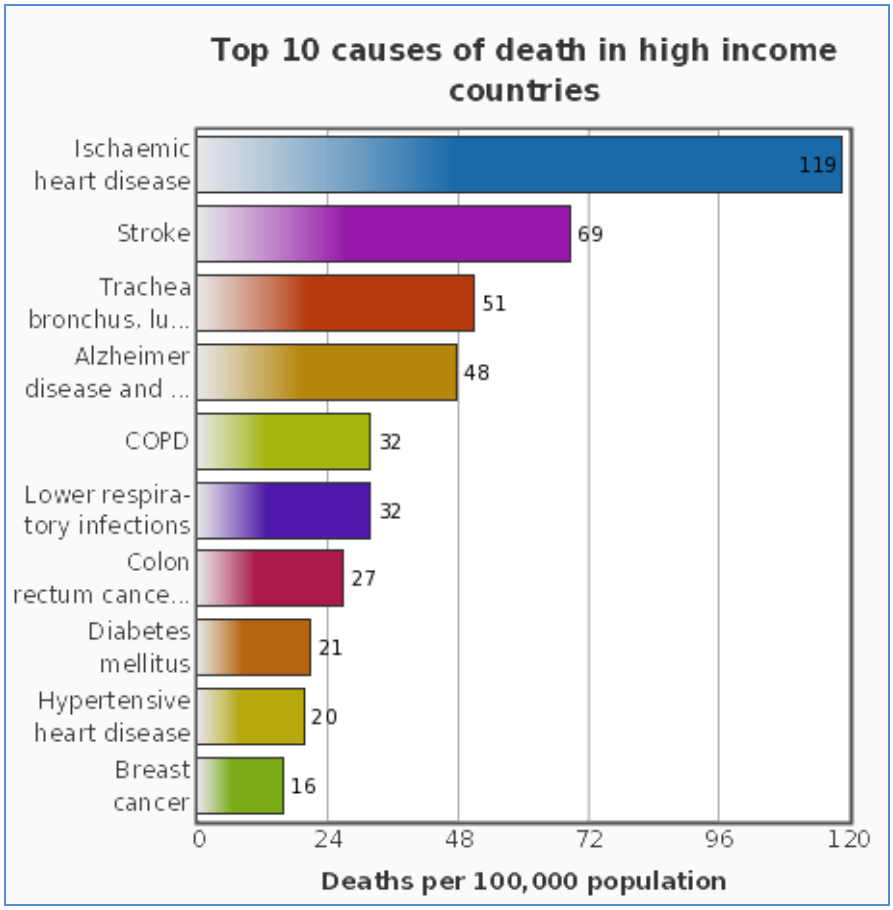
- Ischemic heart disease,
- stroke,
- lower respiratory infections,
- chronic obstructive lung disease,
- diarrhea and
- HIV/AIDS.

Tuberculosis is no longer among the 10 leading causes of death, but is still among the top 15, and killed one million people in 2011.
Chronic diseases cause increasing numbers of deaths worldwide. In 2000, lung cancers (along with trachea and bronchus cancers) caused 1.5 million (2.7%) deaths in 2011, up from 1.2 million (2.2%) deaths. Diabetes caused 1.4 million (2.6%) deaths in 2011, up from 1.0 million (1.9%) deaths in 2000.

The comprehensive chart of 10 leading causes of death worldwide can be seen below.

However, the causes of death differ around the world, in lower income areas infectious diseases cause the most deaths, in high income countries the most important causes are the non-infectious diseases.
Therefore, the priorities of preventive medicine differ according to leading causes of death. Each country must first define the main causes of death, and only then assemble the list of priorities to be taken.
Low income countries must focus on infection control, especially on respiratory infections and HIV. High income countries should focus on preventing non-infectious diseases. According to data, 50% of deaths in high-income countries are caused by cardiovascular diseases and 25% by cancer. Prevention should focus on promoting healthy lifestyle, fight against smoking, alcohol, drugs, obesity, unhealthy diet and physical activity. Screening should play an important role as well.


Top 10 causes of death in low-income countries
2011
Lower respira-tory infections
98
HIV/AIDS
70
Diarrhoeal diseases
69
Stroke
56
Ischaemic heart disease
47
Prematurity
43
Malaria
38
Tuberculosis
32
Protein energy maln...
32
Birth asphyxia and...
30
0
20
40
60
80
100
Deaths per 100,000 population


Top 10 causes of death in high income countries
Ischaemic heart disease
119
Stroke
69
Trachea bronchus, lu...
51
Alzheimer disease and ...
48
COPD
32
Lower respira-tory infections
32
Colon rectum cance...
27
Diabetes mellitus
21
Hypertensive heart disease
20
Breast cancer
16
0
24
48
72
96
120
Deaths per 100,000 population

6.2.9. The costs – The USA example

Despite the fact that USA spends more than twice what most other industrialized nations spend on health care, the U.S. ranks 24th out of 30 such nations in terms of life expectancy. A major reason for this startling fact is that the USA spends only 3% of their health care dollars on preventing diseases (as opposed to treating them), when 75% of health care costs are related to preventable conditions. To adequately meet prevention needs, and to control unsustainable growth in health care costs, a 2012 Institute of Medicine (IOM) report recommended to increase federal funding for public health and prevention by $12 billion annually, a doubling of the FY 2009 federal investment in public health. This may seem a lot, but in reality it isn't because the USA spends 2.5 trillion dollars each year on health care.

Nations in general recognize the importance of prevention, but still are relenting to spend on it, so the USA example is outstanding in its severity, but not unseen around the world. Prevention is a very cost-effective measure. For example, by focusing on the previously mentioned lifestyle factors, the incidence of not only cardiovascular and cancerous diseases will decrease but also that of many other diseases (e.g. musculoskeletal diseases, respiratory diseases, CNS diseases). One of the key aspects of prevention is to find and influence the least common denominator.

Materials used: http://www.pitt.edu/~super7/32011-33001/32311.ppt

Topics suggested for students' oral presentations:

1. What are the leading causes of death in your country? What types of prevention measures would you take in order to decrease mortality?
2. What types of specific prevention programs already exist in your country? How much does your country spend on prevention alone, and how much on the health care as a whole?