

Non-Communicable Diseases CVDs

Jehad Elhissi, Ph.D.
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Definition of Non-Communicable Diseases

- **NCDs are medical health problems that could be associated with exposure to risk factors and affect specific groups of the population**
- **NCDs currently constitute an important health problem due to the epidemiologic & demographic transition & multi-factorial nature of the risk factors**
- **Developing countries will continue to have the double burden of disease related to CD & NCD**

The Problem of Chronic Disease

- 80% of chronic disease deaths occur in low- and middle-income countries
- Only 20% of chronic disease deaths occur in high-income countries
- 60% of all deaths are due to chronic diseases
- The threat is growing; the number of people, families & communities is increasing
- The growing threat is an underappreciated cause of poverty & hinders the economic development of many countries

Reasons for the Increasing Prevalence of the NCD

- Demographic transition
- Epidemiologic transition
- Nutrition transition
- Multifactorial nature of the risk factors for NCDs
- Migration of population across different countries
- International communication
- Epidemiology of NCDs differs across countries
- Epidemiology of NCD is changing all the times
- Limited use of scientific progress in the management of NCDs



General Outlines for Prevention & Control of NCD

Tertiary prevention	Secondary prevention	Primary prevention
■ Medical rehabilitation ■ Social rehabilitation ■ Psychological rehabilitation ■ Vocational rehabilitation	■ Early detection of disease through ● Periodic examination ● Screening tests ■ Proper management of disease conditions	■ Health education ● To ↑ awareness about risk factors ● Improve lifestyle ■ Environmental sanitation e.g. ● Reduce air pollution ■ Adequate nutrition ● ↑ consumption of fruits & vegetables ■ Health legislation ● Antismoking laws



Common NCDs in Palestine

- NCDs are the leading causes of mortality & morbidity in EMR
- The cost of treating NCDs is beyond the financial capabilities of EMR countries
- So, primary prevention of NCDs should be the ultimate goal
- In Palestine, to plan for prevention programs, health authorities need to identify the prevalence of NCDs



Common NCDs in Palestine

- In Palestine, exact national data is unavailable on the prevalence of CVDs, hypertension, DM, & accidents
- The number of patients visiting the PHC doesn't reflect the real prevalence
- No classification by gender & age
- Unavailable information on disabilities resulting from NCDs
- There is fragmentation in reporting of NCDs



Risk Factors

Cardiovascular Diseases (CVD)

Hypertension



Cardiovascular Diseases (are the leading causes of death and disability)

- Coronary heart diseases
- Rheumatic heart diseases
- Congenital heart diseases
- Hypertension



Major Modifiable Risk Factors of CVD

High blood pressure:

- Major risk for heart attack & the most important risk factor for stroke.

Abnormal blood lipids

- High total cholesterol, LDL-cholesterol & triglyceride levels, & low levels of HDL cholesterol increase risk of coronary heart disease & ischaemic stroke.

Tobacco use

- Increases the risk of CVD, especially in people who started young & heavy smokers. Passive smoking an additional risk.

Physical inactivity

- Increases risk of heart disease and stroke by 50%



Major Modifiable Risk Factors of CVD

Obesity:

Major risk for coronary heart disease & diabetes.

Unhealthy diets

Low fruit & vegetable intake is estimated to cause about 31% of coronary heart disease and 11% of stroke worldwide; high saturated fat intake increases the risk of heart disease and stroke through its effect on blood lipids and thrombosis.

Diabetes mellitus:

Major risk for CHD & stroke.



Other Modifiable Risk Factors for CVD

Low socioeconomic status (SES)

Consistent inverse relationship with risk of heart disease & stroke.

Mental ill-health

Depression is associated with an increased risk of CHD.

Psychosocial stress

Chronic life stress, social isolation and anxiety increase the risk of heart disease and stroke.

Alcohol use: One to two drinks per day may lead to a 30% reduction in heart disease, but heavy drinking damages the heart muscle.



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Non-Modifiable Risk Factors of CVD

Advancing age: Most powerful independent risk factor for cardiovascular disease; risk of stroke doubles every decade after age 55.

Heredity or family history: Increased risk if a first-degree blood relative has had coronary heart disease or stroke before the age of 55 years (for a male relative) or 65 years (for a female relative).

Gender: Higher rates of coronary heart disease among men compared with women (premenopausal age); risk of stroke is similar for men and women.

Ethnicity or race

- Increased stroke noted for Blacks, some Hispanic Americans, and Chinese; increased cardiovascular disease deaths noted for South Asians and American Blacks in comparison with Whites



“Novel” Risk Factors for CVD

- Excess homocysteine in blood

High levels may be associated with an increased risk of CVD.

- Inflammation

Several inflammatory markers are associated with increased cardiovascular risk, e.g. elevated C-reactive protein (CRP).

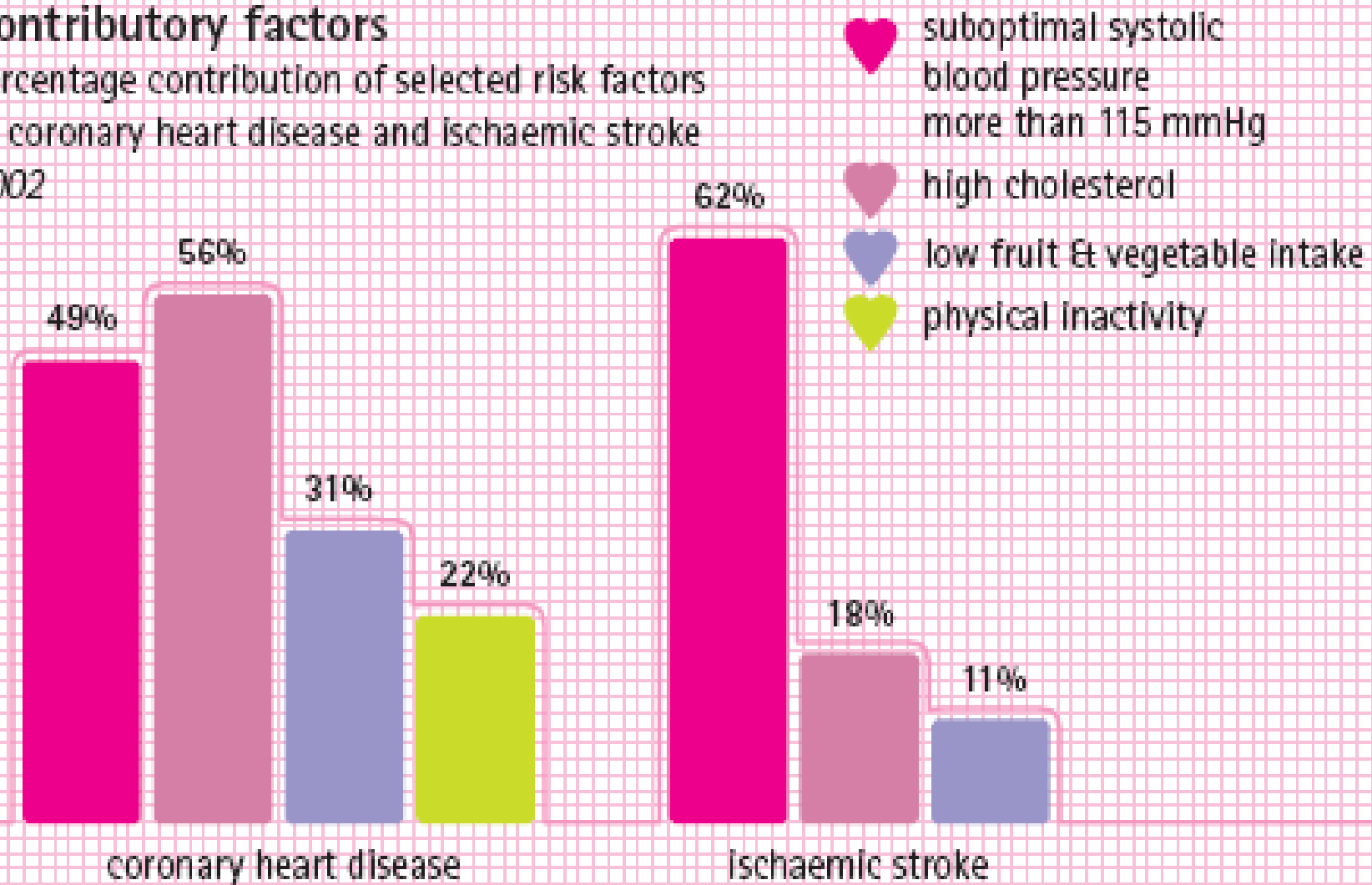
- Abnormal blood coagulation



Elevated blood levels of fibrinogen and other blood-

Contributory factors

Percentage contribution of selected risk factors
to coronary heart disease and ischaemic stroke
2002

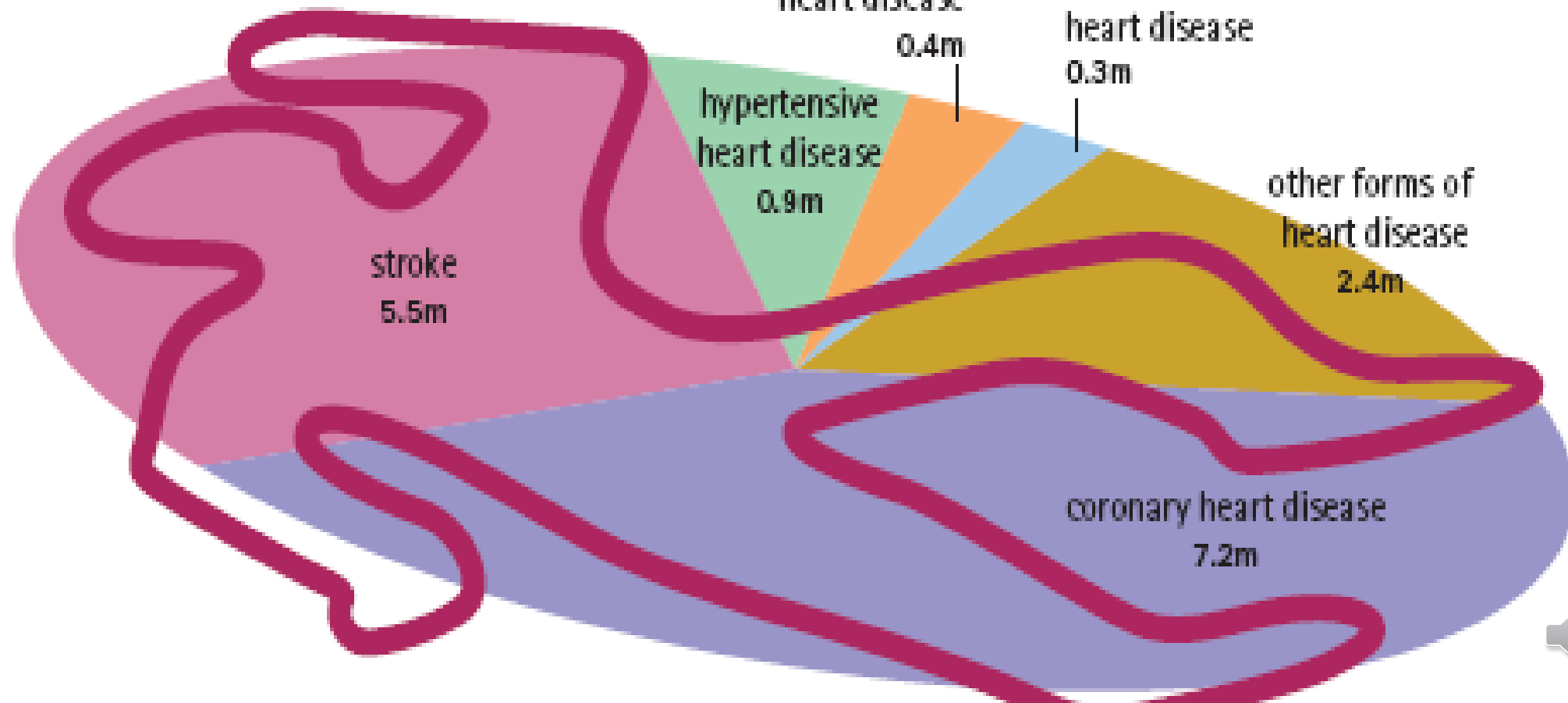


Global deaths from CVD

millions

2002

total deaths: 16.7 million



(CHD), Causes of Myocardial Ischemia

Diminished blood flow in coronary

- Coronary atherosclerosis, thrombosis, spasm
- Coronary embolism, stenosis

Diminished flow of oxygenated blood to the myocardium

- Anemia
- Hypotension (reduced coronary perfusion pressure)

Increased oxygen requirements of the myocardium

- Hypertrophied myocardium (aortic stenosis, hypertension)
- Increased cardiac output



Coronary Heart Diseases (CHD)

- The leading cause of adult mortality and a common cause of disability
- The prevalence of CHD is increasing all over the world as pp live longer with sustained exposure to the risk factors
- The epidemiological profile of CHD in any country depends on the prevalence of the different risk factors



(CHD), Atherosclerosis

- The major underlying pathology in CHD. It is due to hyperlipidemia, infection, cigarettes, and other factors.
- Is the process that affects medium-sized arteries all over the body, including the coronary arteries
- Could result in obstruction of blood flow in the coronary arteries and cause myocardial ischemia/infarction 

(CHD), Manifestation

- **Angina pectoris**
Classical angina
Non-classical angina
- **Major complications**
Myocardial infarction
Heart failure
Arrhythmias
Sudden death are the



(CHD), Risk factors

The incidence and prevalence of CHD in any community is determined by

- The prevalence of a specific profile of the population,
- The prevalence of lifestyle
- The prevalence of the disease conditions that predispose to CHD



(CHD), Demographic Risk Factors (continued)

Age;

As atherosclerosis progresses with age, CHD increases with age (after 40).

- Young adults (20-30 yrs) smokers could be at risk.

Sex

- Before menopause: M:F ratio 10:1
- After menopause: M:F ratio 4:1 before 60 to 1:1 after 60



(CHD), Demographic Risk Factors (continued)

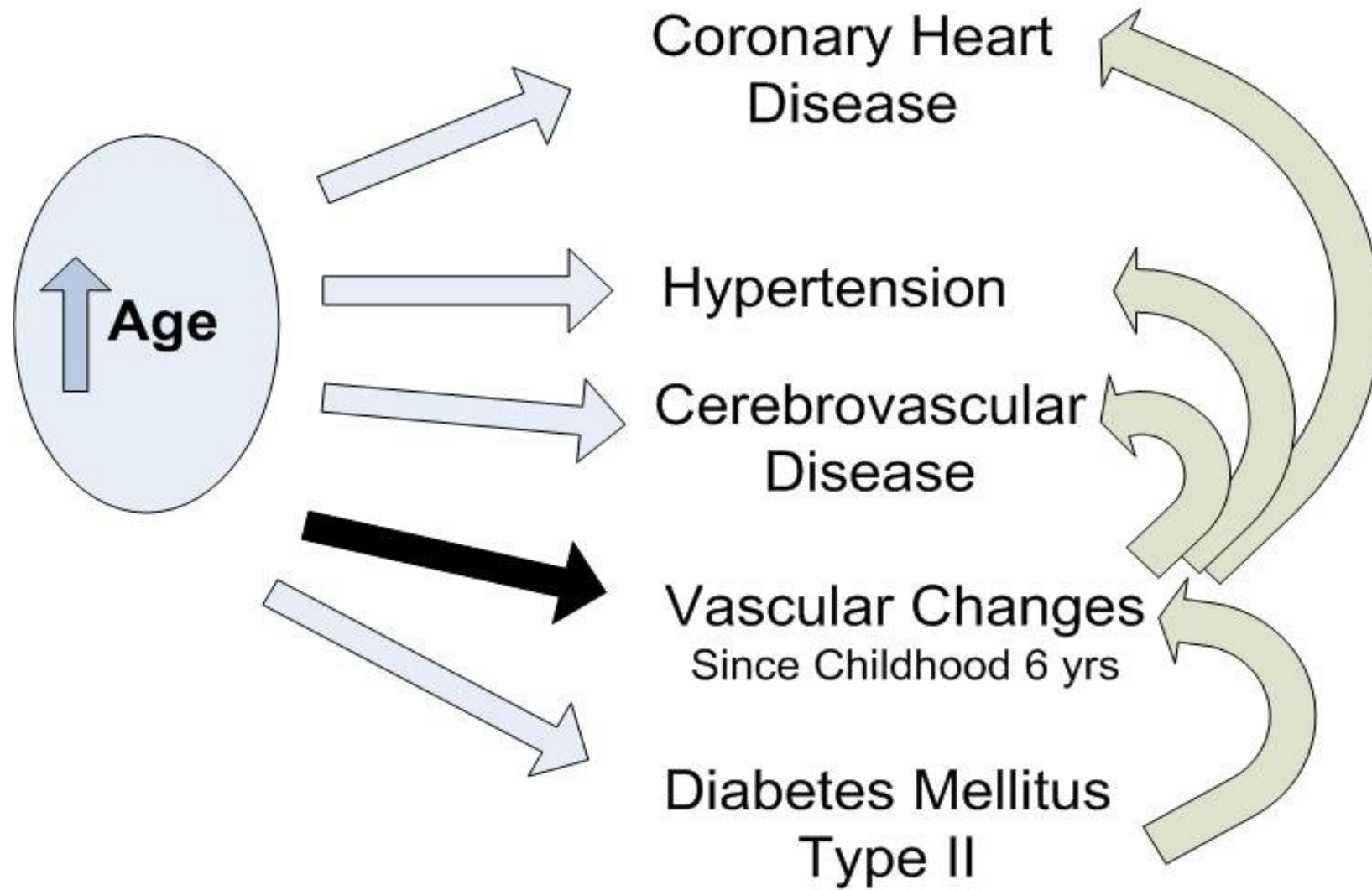
Genetics

- Genetic factors play a role in hyperlipidemia
- Familial tendency, dietary and lifestyle patterns among family members

Psychological and social factors

- Emotional status, anger, aggression, fear, anxiety
- Type A personality character, aggressiveness, competitive drive
- Supportive social environment at home and at work reduces the risk of CHD





(CHD) Lifestyle Risk Factors (continued)

Diet

- Saturated fat and cholesterol are risks
- Protective (plant oils, marine fish, complex carbohydrates)

Physical activity versus sedentary life

- Physical activity may result in ↓ blood pressure and aid in smoking cessation, ↑ coronary blood flow
- Sedentary life ↑ CHD by ↑ obesity, hypertension, hyperlipidemia, diabetes



(CHD) Lifestyle Risk Factors (continued)

Cigarette smoking

- Chronic promoter of atherosclerosis
- Acute risk factor due to its role in ↑ sympathetic stimulation due to the effect of nicotine and co.
- Enhances clotting and platelet adhesions

Alcohol

- ↑ risk of hypertension, ↑ risk of hyperlipidemia
- Affects hemostatic factors (fibrinogen, platelet aggregation, and fibrinolysis)



(CHD), Disease Conditions as Risk Factors (continued)

Hyperlipidemia

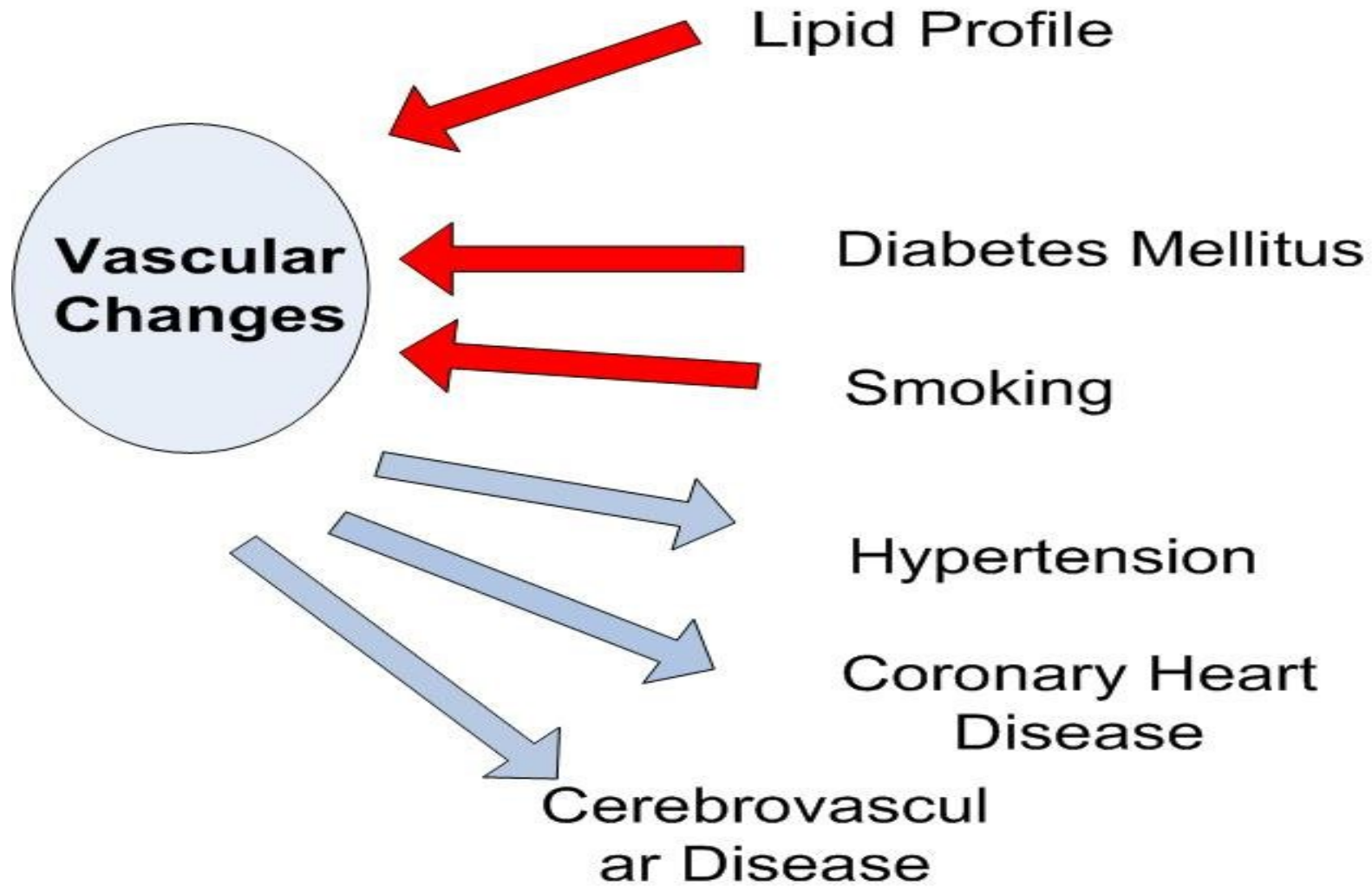
Hypertension

Diabetes mellitus

Overweight and obesity

Other risk factors for CHD





(CHD), Prevention & Control

Demographic	Lifestyle	Disease Conditions
■ Age ■ Sex ■ Genetic ■ Psychological & social factors	■ Diet ■ Physical activity ■ Cigarette smoking ■ Alcohol consumption	■ Hyperlipidemia ■ Hypertension ■ Diabetes mellitus ■ Obesity ■ Others
Health education directed to risk groups	Health education for behavioral changes	Prevention & control of specific conditions



Hypertension

- Is one of the important causes of disease burden in developed & developing countries.
- Is one of the major risk factors for CVD.
- Is called the silent killer
- It's management reduces mortality, stroke, CHD & heart failure.



Categories of Blood Pressure Status

Blood Pressure Status Category	Blood Pressure Level (mmHg)		
	Systolic		Diastolic
Normal	< 120	&	< 80
Pre-hypertension	120 - 139	&/or	80 - 89
High Blood Pressure			
Stage 1 hypertension	140 - 159	&/or	90 - 99
Stage 2 hypertension	≥ 160	&/or	≥ 100



Types of Hypertension

Primary or essential hypertension with unknown cause:

- It accounts for 90–95% of hypertension cases. There are specific risk factors

Secondary hypertension with different causes:

- It forms 5-20% of hypertension cases.



Causes of Secondary Hypertension

- Renal hypertension
 - It accounts for about 80% of cases of secondary hypertension
 - Renal disease includes chronic glomerulonephritis, diabetic nephropathy, chronic interstitial nephritis, renal artery stenosis, and adult polycystic disease.
- Endocrine hypertension
 - Adrenal gland disorder (Cushing's disease, Conn's syndrome)
 - Pituitary gland disorder (Acromegaly)



Causes of Secondary Hypertension

- Cardiovascular disorders (coarctation of the aorta)
- Drugs (estrogen, steroids, vasopressin)
- Collagen diseases
- Pregnancy-induced hypertension



Risk Factors for Hypertension

- **Personal risk factors**

Age: increases with age

Sex:

- In early middle age: risk is high among males
- In the age group 55-64: risk is the same
- In the ages ≥ 65 : risk is higher among females

Race: blacks are at higher risk than whites

Genetic: hypertension runs in families



Risk Factors for Hypertension (continued)

- Lifestyle risk factors
 - Sodium intake
 - Low potassium intake
 - Obesity: 10 mmHg systolic & 5 mmHg diastolic for each 5 kg lost.
 - Sedentary lifestyle:
 - Tobacco smoking
 - Psychological disorders: stress, anxiety
 - Alcohol disorders
 - Hyperlipidemia



Prevention & Control of Hypertension

- **Health education programs**
 - Reduce dietary salt intake
 - Physical activity
 - Quitting smoking
 - Correcting hyperlipidemia
 - Reduce stress & worry
 - Maintaining a healthy body weight



Prevention & Control of Hypertension

- **Increase the consumption of a diet rich in the following**
- Potassium (pulses, fruits, potatoes, tomatoes)
- Calcium
- Fruits & vegetables
- Polyunsaturated fatty acids
- Magnesium reduces blood pressure for patients on diuretics
- **Periodic medical examination**
- **Prevention & control of disease associated with secondary hypertension** 

Cerebrovascular Disease



Cerebrovascular Disease

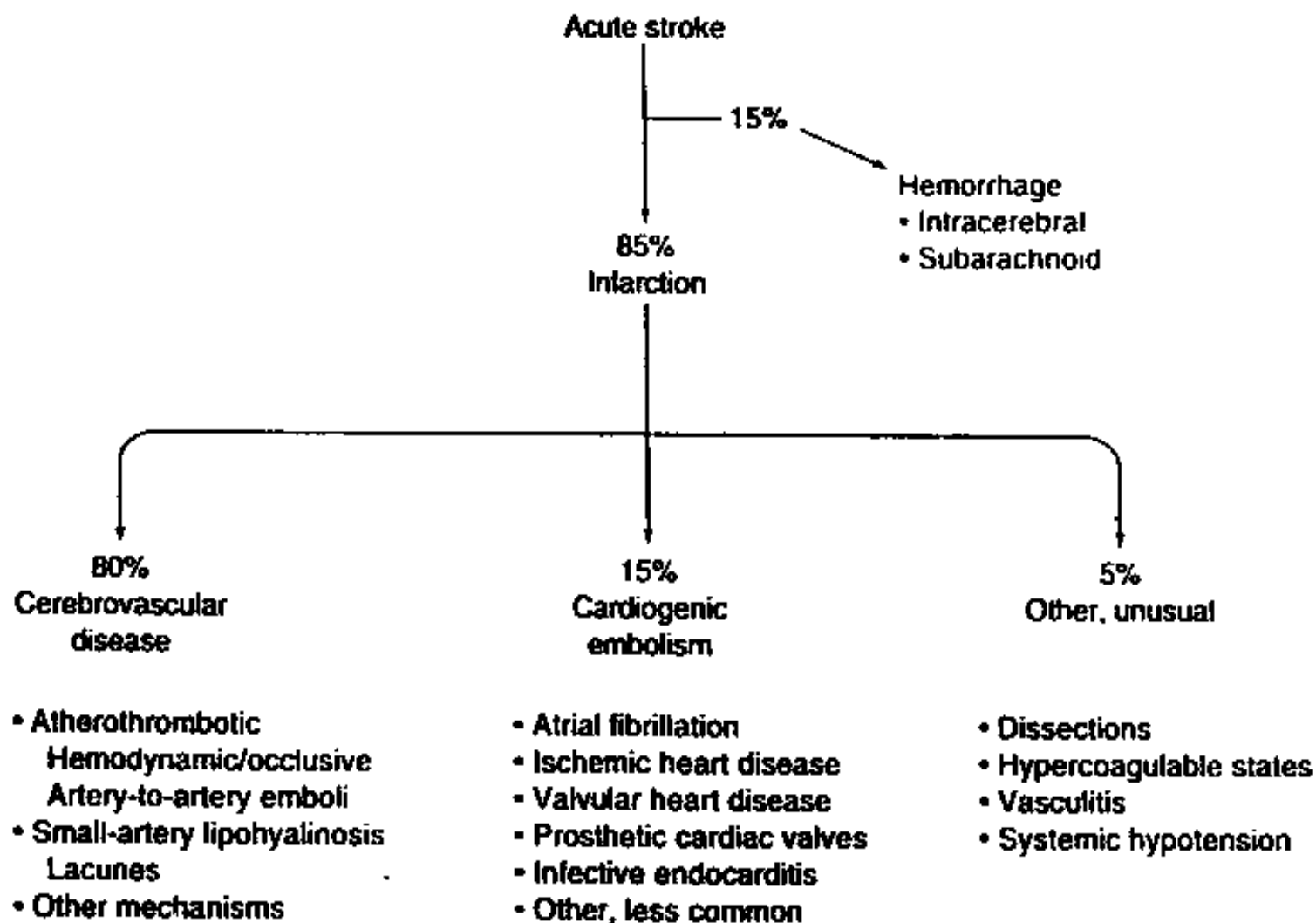
- **Stroke is called that because of the way it strikes people down.**
- **Stroke, or a brain attack, is a sudden problem affecting the blood vessels of the brain.**



Stroke

- Stroke is the second leading cause of death above the age of 60 years, & the fifth leading cause in people aged 15 to 59 years old.
- Stroke is the brain equivalent of a heart attack.
- Blood must flow to & through the brain for it to function.
- If its flow is obstructed by a blood clot moving to the brain, or by narrowing or bursting of blood vessels, the brain loses its energy supply, causing tissue damage and leading to stroke.





Types of Stroke

- **Ischemic Stroke**

The most common type of stroke, accounting for almost 80-85% of all strokes, is caused by a clot or other blockage within an artery leading to the brain.

- **Intracerebral Hemorrhage**

An intracerebral hemorrhage is a type of stroke caused by the sudden rupture of an artery within the brain. Blood is then released into the brain, compressing brain structures.

- **Subarachnoid Hemorrhage**

A subarachnoid hemorrhage is also a type of stroke caused by the sudden rupture of an artery. A subarachnoid hemorrhage differs from an intracerebral hemorrhage in that the location of the rupture leads to blood filling the space surrounding the brain rather than inside of it.

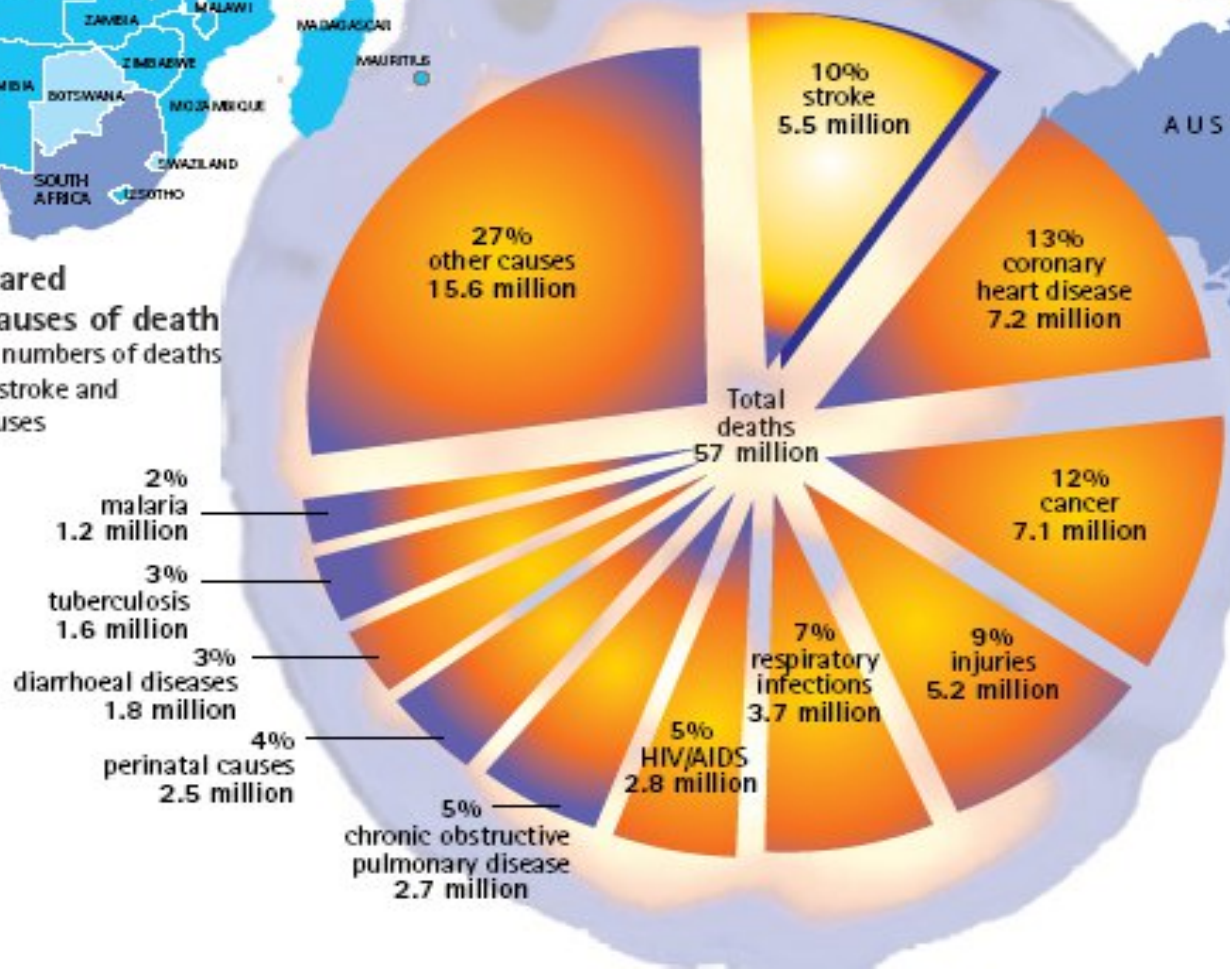
Stroke

- Annually, 15 million people worldwide suffer a stroke.
- Of these, 5 million die & another 5 million are left permanently disabled.
- Stroke is uncommon in people under 40 years
- When it does occur, the main cause is high blood pressure.
- Stroke also occurs in about 8% of children with sickle cell disease.
- Among those aged under 65, two-fifths of deaths from stroke are linked to smoking.
- Stroke is the third most common cause of death in developed countries, exceeded only by & CHD & cancer.





Stroke compared with other causes of death
Percentages and numbers of deaths worldwide from stroke and other leading causes 2002



What risk factors for stroke can't be changed?

Unmodifiable

- Age:

The chance of having a stroke approximately doubles for each decade of life after age 55.

- Heredity (family history):

Stroke risk is greater if a parent, grandparent, sister, or brother has had a stroke.

- Race:

African Americans have a much higher risk of death from a stroke than Caucasians do. This is partly because blacks have higher risks of high blood pressure, DM & obesity.



What risk factors for stroke can't be changed?

Unmodifiable (continued)

- Sex:

In most age groups, stroke is more common in men than women. However, more than half of total stroke deaths occur in women. Use of birth control pills & pregnancy pose special stroke risks for women.

- History of stroke:

The risk of stroke for someone who has already had one is many times that of a person who has not.

TIA's are "warning strokes" that produce stroke-like symptoms but no lasting damage.

TIA's are strong predictors of stroke. A person who's had one or more TIA's is almost 10 times more likely to have a stroke than someone of the same age and sex who hasn't.



What stroke risk factors can be changed, treated, or controlled? **Modifiable**

- **HTN** is the most important controllable risk factor for stroke. Treating hypertension can reduce the risk of a stroke by up to 40%.
- **Smoking**: studies have shown smoking to be an important risk factor for stroke. The nicotine & co in cigarette smoke damage the CVS in many ways. The use of oral contraceptives combined with cigarette smoking greatly increases stroke risk.
- **DM** is an independent risk factor for stroke. Many people with DM also have high HTN, high blood cholesterol & are overweight. This increases their risk even more.
- **Carotid or other artery disease**: A carotid artery narrowed by fatty deposits from atherosclerosis may become blocked by a blood clot 

What stroke risk factors can be changed, treated or controlled? **Modifiable** (continued)

- **Atrial fibrillation** raises the risk of stroke. The heart's upper chambers quiver instead of beating effectively, which can cause blood to pool and clot. If a clot breaks off, enters the bloodstream, and lodges in an artery leading to the brain, it can cause a stroke.
- **Other heart disease:** People with CHD or heart failure have a higher risk of stroke than those with hearts that work normally. Dilated cardiomyopathy, heart valve disease & some types of congenital heart defects also raise the risk of stroke.
- **Sickle cell disease:** Sickled red blood cells are less able to carry oxygen to the body's tissues and organs. These cells also tend to stick to blood vessel walls, which can block arteries to the brain and cause a stroke.



What stroke risk factors can be changed, treated or controlled? **Modifiable** (continued)

- **High blood cholesterol:** People with high blood cholesterol have an increased risk of stroke. Also, it appears that low HDL cholesterol is a risk factor for stroke in men, but more data are needed to verify its effect in women.
- **Poor diet:**
 - A diet high in saturated fat, trans fat & cholesterol can raise blood cholesterol levels.
 - Diets high in sodium can contribute to increased blood pressure.
 - Diets with excess calories can contribute to obesity.
 - Also, a diet containing five or more servings of fruits & vegetables per day may reduce the risk of stroke.
- **Physical inactivity and obesity:** Being inactive, obese, or both can increase your risk of high blood pressure, high blood cholesterol, diabetes, heart disease & stroke.

What are other, less well-documented risk factors?

- **Socioeconomic factors:**

Strokes are more common among low-income people than among more affluent people.

- **Alcohol abuse:**

Can lead to multiple medical complications, including stroke.

- **Drug abuse**

Drug addiction is often a chronic relapsing disorder associated with a number of societal and health-related problems.

Drugs that are abused, including cocaine, amphetamines, and heroin, have been associated with an increased risk of stroke.



Cerebrovascular Diseases Mortality in Palestine

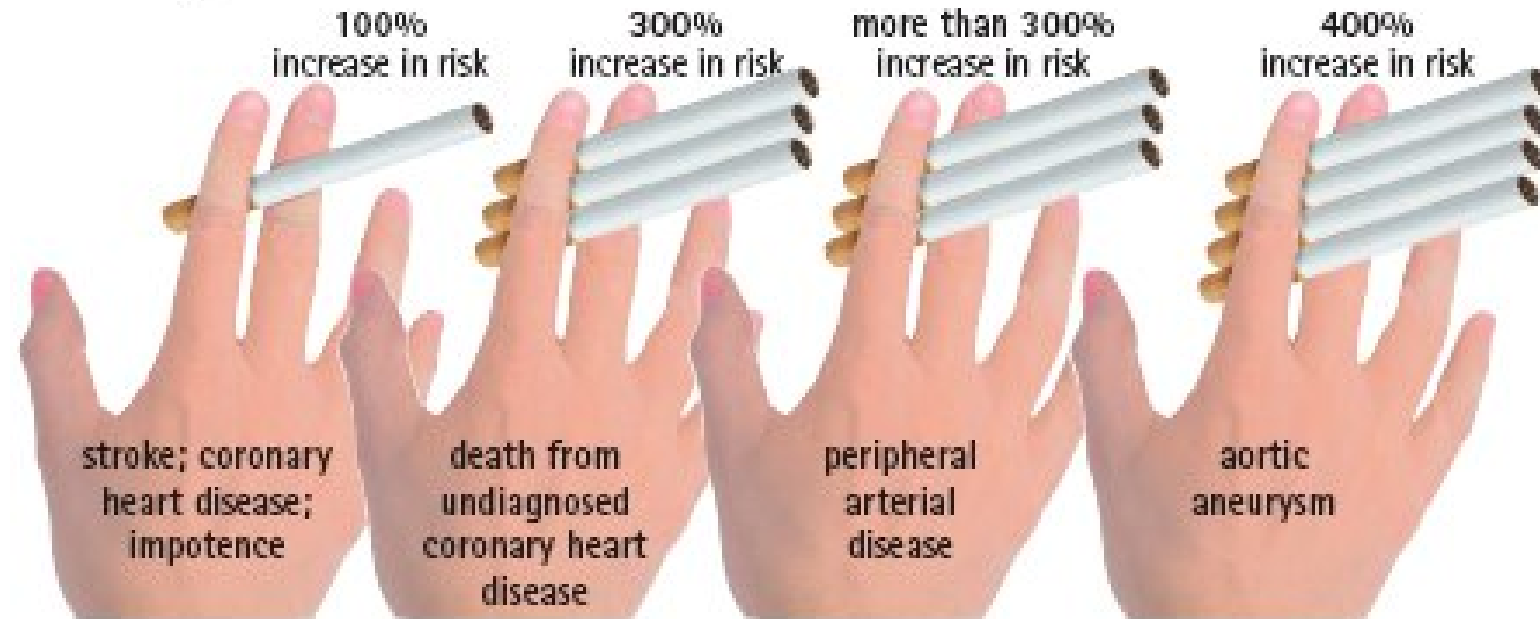
- In the general population, it was one of the leading causes of death (11%), with a rate of 29.8/100,000 pp
- The third leading cause in males (9.9%) & the second in females (12.4%).
- It represents the third leading cause of death in total cardiovascular mortality (29.5%), with a rate of 29.8/100,000 pp.



● Smoking

Cardiovascular risks of smoking

Percentage increase in risk



Smoking

“From a short pleasure can come a long repentance.” ندم

- The public may believe that the major risk from cigarettes is lung cancer
- But far more smokers develop CVD –mainly heart attacks and stroke.
- In 1940, a link was identified between cigarettes and CHD
- The risks are much higher in people who started smoking before the age of 16.



• Tobacco use other than smoking & passive smoking are also

Smoking Promotes CVD Through Several Mechanisms.

- It damages the endothelial lining of the blood vessels
- Increases cholesterol plaques (fatty deposits in the arteries)
- Increases clotting, raises LDL-cholesterol levels & lowers HDL
- Promotes coronary artery spasm.
- Nicotine accelerates the heart rate & raises blood pressure.
- A gene has been discovered that increases smokers' risk of developing CHD by up to four times.
- Around a quarter of the population carries one or more copies of this gene.



Women Smokers

- Are at particular risk, with a higher risk of heart attack than male smokers.
- Women who smoke only three to five cigarettes a day double their risk of heart attack
- Men who smoke six to nine cigarettes a day double their risk.
- Smoking during pregnancy is associated with delivery of LBW



Smoking

- Tobacco is the leading preventable cause of death in the world.
- Worldwide, an estimated 1.2 billion people smoke
- Tobacco kills up to 50% of its regular users
- Adolescent experimentation with this highly addictive product, aggressively pushed by the tobacco industry, can easily lead to a lifetime of tobacco dependence



Factors Affecting the Hazard of Smoking

Form of smoking: cigarettes are the riskiest, while cigars & pipes are less risky

Quality of tobacco: Low-grade tobacco contains more nicotine & tar

Age of starting: the earlier, the higher the risk of smoking is

Period of continued smoking

Number of cigarettes smoked per day

Smoking process Length of cigarette, how much of it is smoked, number of puffs taken, & extent of smoked inhalation



Hazards of Smoking

- **Cardiovascular disease**
- **Cerebrovascular disease**
- **Cancers**
- **Respiratory hazards**
- **Peptic ulcer**
- **Unfavorable outcome of pregnancy**
- **Periodontitis**



Hazards of Smoking

- **Others**
 - More work absenteeism
 - High expenditure on medical treatment
 - High susceptibility to postoperative complications
 - Sexual health problems for males



Control of Smoking

- Education program

Giving full knowledge of the problem & health hazards of smoking to

- The public
- Students, providers of medical care, & social services
- High-risk groups, such as CVD cases, users of oral pills, DM, workers in the asbestos industry, & the obese



Control of Smoking

- **Enforced restrictions: by legislation for**
- **Cigarette packets on the market must give**
Nicotine & tar content of tobacco in mg/cigarette
Warning that “smoking is hazardous to health, & is the responsibility of smokers.”
- **Restricting advertisement of cigarettes by the different mass media**
- **Restricting availability & sale of cigarettes to the young**
- **Restricting smoking in public places, offices & means of transport**



Control of Smoking

- **Management of smokers**

Helping smokers to give up: the earlier, the better

When stopping smoking, the risk of hazards declines progressively, returning to non-smoking levels within 10 years

