

بسم الله الرحمن الرحيم

- الحمد لله رب العالمين والصلاة والسلام علي سيدنا محمد الصادق الوعد الأمين ، اللهم أخرجنا من ظلمات الجهل والوهم ، إلى نور المعرفة والعلم..

Epidemiology of Non-Communicable Diseases

Chronic diseases have been defined as :

Chronic illnesses.

- Non-Communicable.
- Degenerative.

Characteristics:

- Uncertain etiology.
- multiple risk factors.
- long latency period .
- Prolonged course of illness.
- non- contagious origin.
- functional disability and sometimes incurability .

- Latency period is the period between contact of the causative agent with susceptible host to the onset of first sign a symptoms.
- The cause of many chronic diseases remains obscure, but risk factors identified for some of the leading chronic diseases. The most important among these risk factor is Tobacco use especially in COPD .

Strategies for the prevention

- Approach to prevention of chronic diseases can be considered under three headings :

- 1-Primordial prevention: prevention or avoiding the development of risk factors in the community to prevent the disease in the population and as such protects the individuals. This involves the avoidance of risk behaviors.

- prevention of disease occurrence by altering susceptibility of the host or reducing exposure of susceptible persons to the risk factors
- Examples : immunization , good nutrition , health education ,
- counseling, environmental sanitation, purification of water , protection against accidents at work place and seat belts.

- Requires : accurate knowledge of causative agent and process of disease.

- 2-Primary prevention : Modifying or reducing the risk factors associated with the development of a disease in individuals with or without the use of interventions, It involves modification of established risk behavior and risk factors with specific interventions to prevent clinically manifest disease

- That is by early detection , screening by examinations altering the course of disease
- Examples : high blood pressure , T.B. Diabetes , Cancer of the breast , Cancer of the cervix colo-rectal cancers, lung cancer etc.

- 3- Secondary prevention : Modifying the risk factors in the presence of the manifested disease by changes in lifestyle and/or use of drugs.

- 4- Tertiary Prevention : alleviation and limitation of disability improvement of quality of life , Rehabilitation and follow up.

- Non communicable diseases are usually thought of as chronic conditions that do not result from an acute infectious process.

- These conditions cause death, dysfunction, or impairment in the quality of life, and they usually develop over relatively long periods—at first without causing symptoms; but after disease manifestations develop, there may be a protracted period of impaired health.

- Generally, these conditions or diseases result from prolonged exposure to causative agents, many associated with personal behaviors and environmental factors.

The major non communicable diseases are :

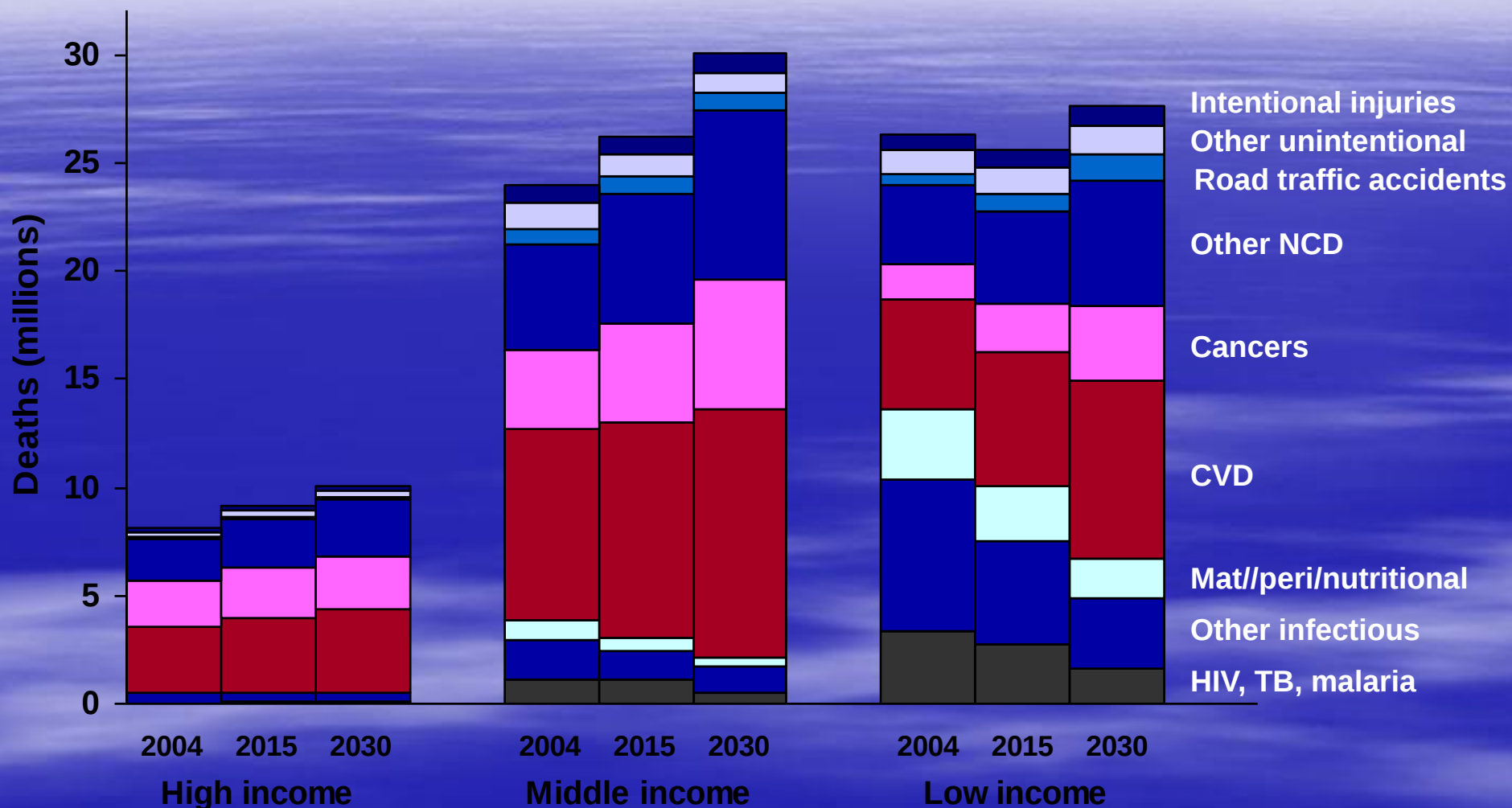
- Cardiovascular Diseases.
- Chronic Obstructive Pulmonary Disease
- Diabetes
- Hypertension
- Cancers
- Accidents in its different types

- Non communicable diseases also include injuries, which have an acute onset, but may be followed by prolonged convalescence and impaired function, as well as chronic mental diseases.
- Most premature deaths are linked to common risk factors, namely tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol.

- According to the WHO, approximately 46% of all NCD-related deaths in 2012 were due to cardiovascular diseases (CVDs), followed by cancers (22%), respiratory disease (11%) and diabetes (4%).

Projected deaths by cause and income (2004 to 2030)

WHO

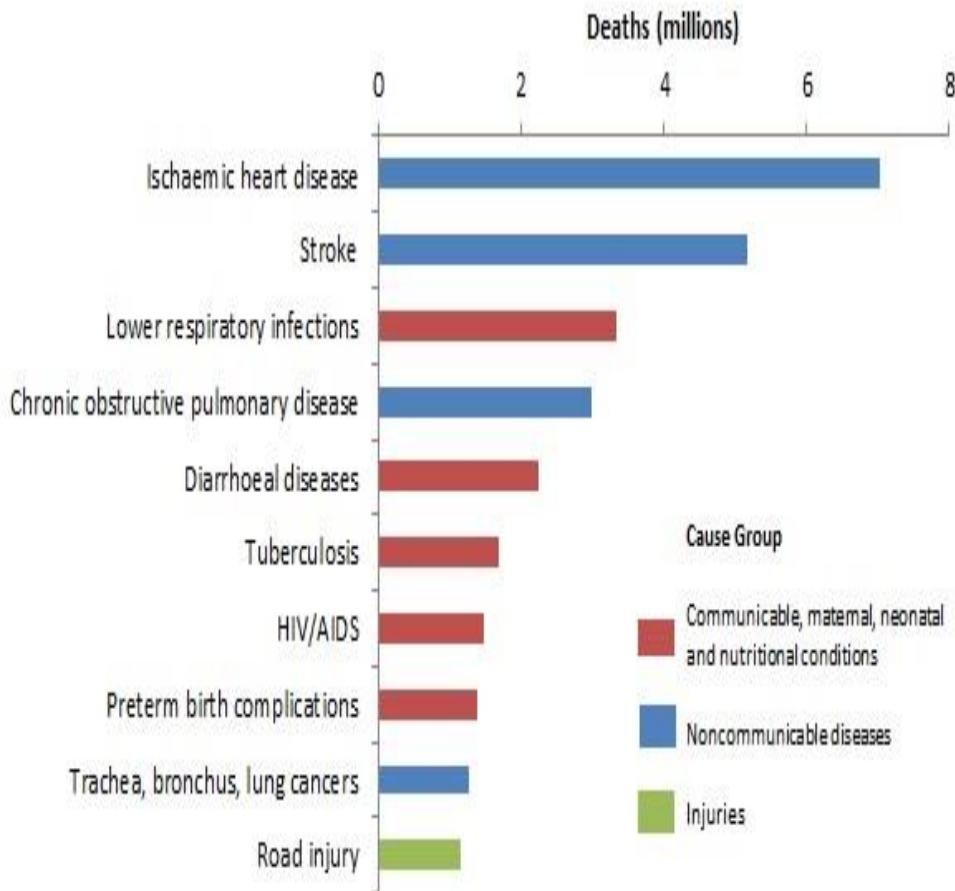


- Non communicable diseases are the leading cause of functional impairment and death worldwide. These conditions have been the leading cause of death in the United States and other high-income countries over the last fifty years, and they are emerging as a leading cause of death in low-to middle-income countries.

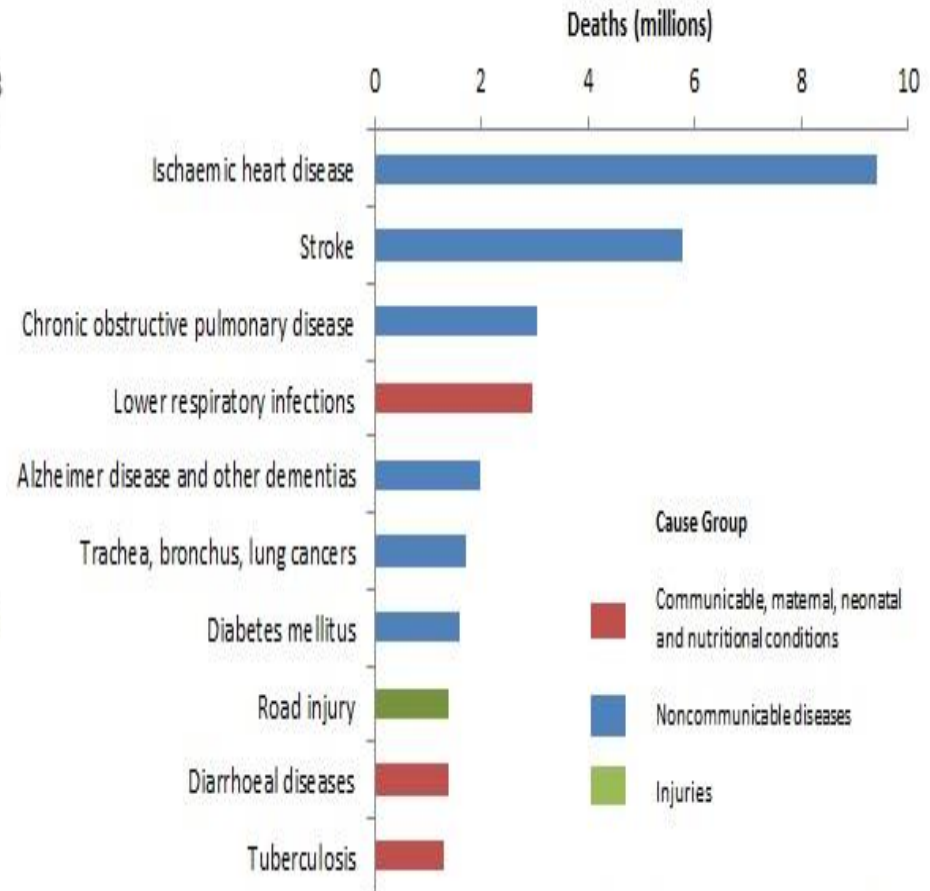
- The leading causes of death worldwide showing that non communicable diseases and injuries account for over **two-thirds of deaths**. In addition, these diseases cause pain, disability, loss of income, disruption of family stability, and an impaired quality of life.

Comparison between Top 10 Global causes of Death in 2000 & in 2016

Top 10 global causes of deaths, 2000



Top 10 global causes of deaths, 2016



The Regional Situation

- In the WHO Region for the Eastern Mediterranean, Chronic Diseases (CVD, Cancer, Diabetes etc..) account for 52% of all deaths and 47% of the disease burden in EMR during the year 2005
- This burden is likely to rise to 60% in the year 2020.
- The conventional risk factors may explain 75% of chronic diseases.

- Out of all non-communicable illnesses,
- Cardiovascular disease (CVD) (coronary heart disease, stroke) is the leading cause of morbidity and mortality worldwide, and is increasing alarmingly in developing countries. Currently, CVD is responsible for about 30% of all deaths worldwide, and is projected to cause 24 million deaths by 2020 .

4 Chronic Diseases result in
52 percent of deaths

EMR Adult Population



Cardiovascular



**Chronic Respiratory
Disease**



Type 2 Diabetes



Cancer

- While the developing world bears most of the burden of these deaths, there are still no signs of success in halting the CVD epidemic there . Moreover, deaths from CVD in developing countries occur at a younger age compared to developed ones, further hindering their social and economic development

- Noncommunicable diseases (NCDs) are a global challenge. During the next several decades, NCDs will govern the health care needs of populations in most low- and middle-income countries because of declines in communicable diseases, conditions related to childbirth and nutrition, changes in lifestyle factors (eg, smoking, lack of exercise and obesity), and population aging .

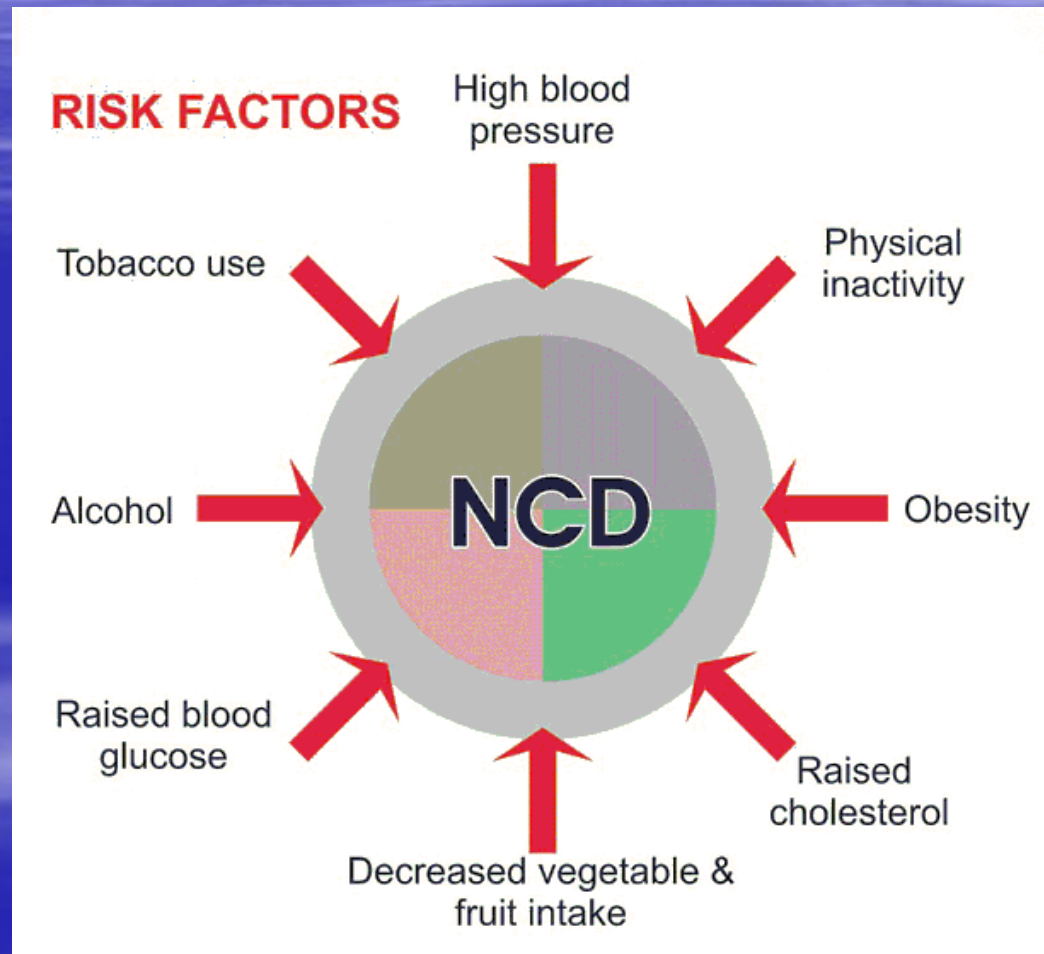
- Cancer is a growing health problem in developing countries also, where more than half of the global total of six million deaths occur.

Cancer IN EMR

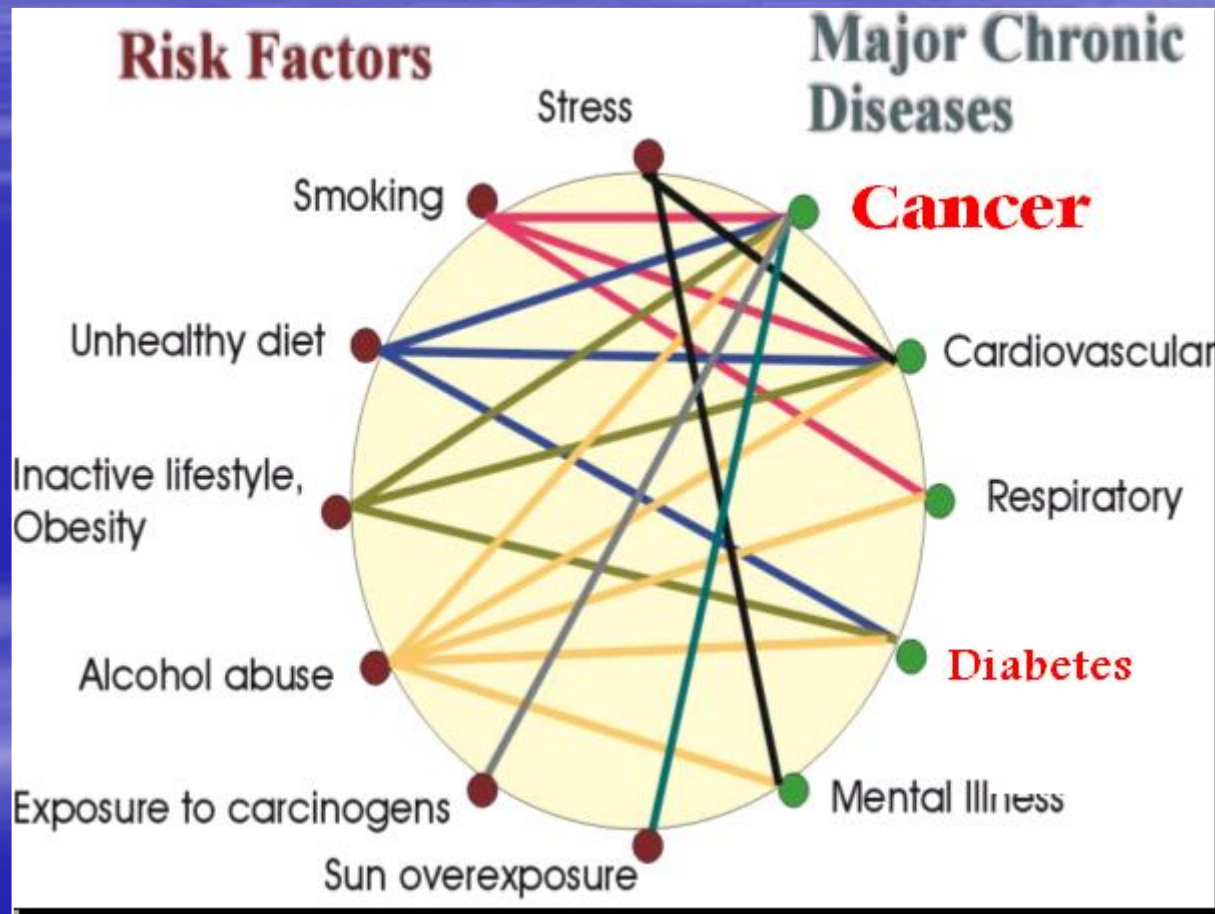
- In EMR, cancer is the 4th ranked cause of death after cardiovascular diseases, infectious/parasitic diseases and injuries.
- Cancer kills each year in the Region, more than HIV/AIDS, tuberculosis and malaria combined.

Non-Communicable Disease (NCD)

CVD , Diabetes , Cancer & COPD



Relations Between Risk Factors & NCDs



- We examined the burden of NCDs in the Hashemite Kingdom of Jordan. We computed the projected prevalence of diabetes, hypertension, and high blood cholesterol. All of these risk factors are associated with an increased risk of cardiovascular disease (CVD) — the leading cause of death in Jordan — and increased health care use.

The burden Noncommunicable diseases In Jordan

- The burden of Noncommunicable diseases is responsible for 75.6% of all deaths; cardiovascular diseases account for 34.7%, cancers 14.6%, respiratory diseases 3.4% and diabetes mellitus 6.7% of all deaths.
- 20% of adults between the ages of 30 and 70 years are expected to die from one of the four main Noncommunicable diseases.
- The prevalence of insufficient physical activity in adolescents is 85.2%.

- Raised blood pressure affects 18.9% of adults above 18 years.
- obesity affects 30% of the population (24.0% males and 36.4% females).
- 25.2% of youth (13–15 years of age, 34.8% boys, 17.8% girls) have ever smoked cigarettes, while more than half (53.6%) of youth have been affected by passive smoking .
- Adult per capita consumption of alcohol is 0.7 liters of pure alcohol.

Global Burden of CVD

- CVDs are the 1st cause of Death Globally.
- An estimated CVD Deaths of 17.3 million people in 2008(30% of all global deaths).
- 7.3 million deaths were due to coronary heart disease.
- 6.2 million deaths were due to stroke.
- By 2030 about 25 million people will die from CVDs.

WHO, World Health Organization.

CVDs Risk Factors

Major Modifiable Risk Factors:

- High Blood Pressure.
- Abnormal Blood Lipids.
- Tobacco Use.
- Physical Inactivity.
- Obesity.
- Un healthy Diet(low fiber & vegetable intake, high Salt consumption).
- Diabetes.

Non Modifiable Risk Factors:

- Age.
- Heredity or Family Hx.
- Gender.
- Ethnicity or race.

Other Modifiable Risk Factors:

- Low Socioeconomic Status.
- Mental ill Health(Depression).
- Psychosocial Stress.
- Heavy Alcohol Use.

Novel Risk Factors:

- Excess homocysteine in the blood.
- Inflammatory Markers(C Reactive Protein).
- Abnormal blood coagulation(elevated blood Fibrinogen)

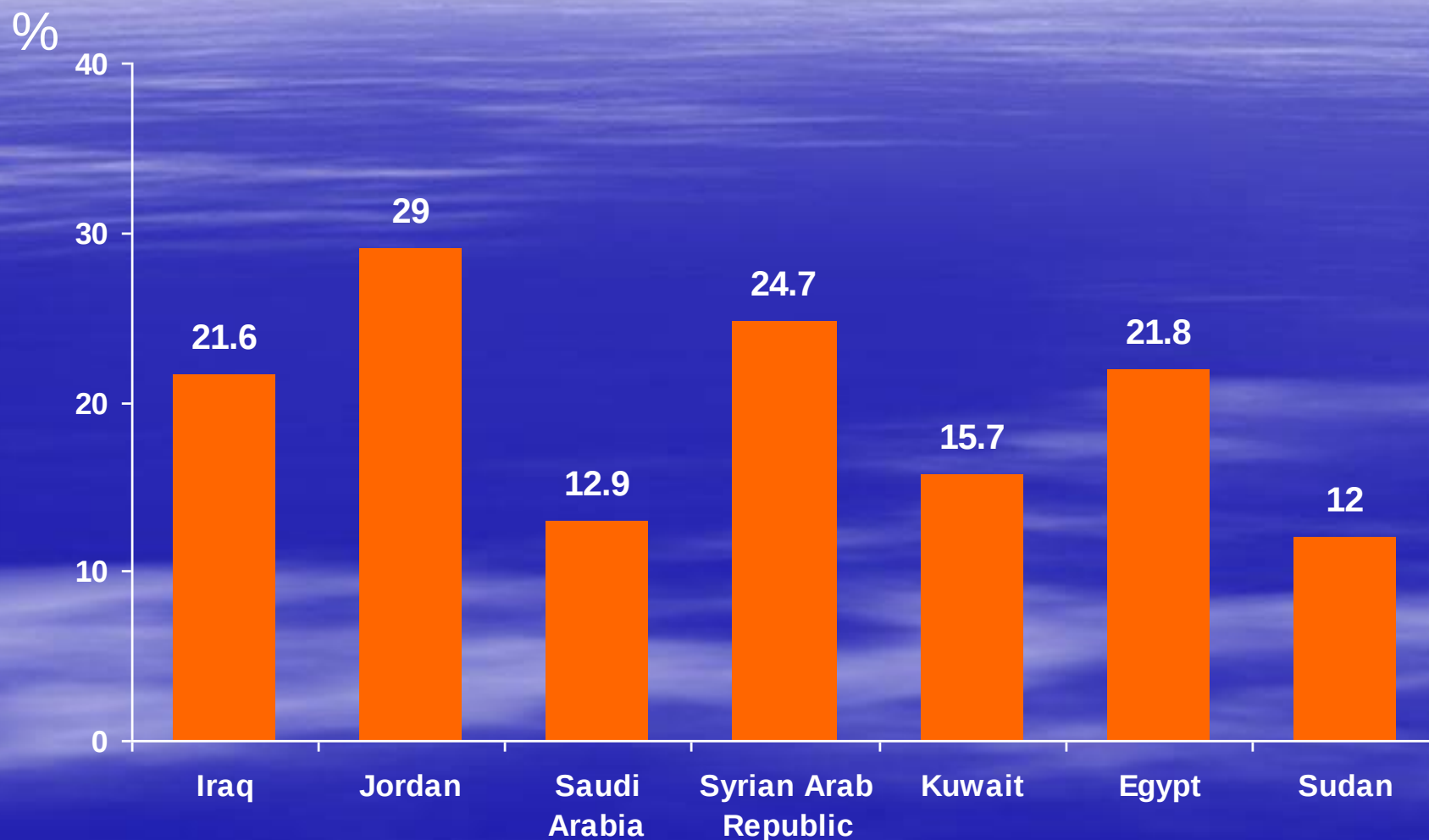
Heart Disease Leading Cause of Death in Jordan

- Heart disease has become a leading threat to the health of the Jordanian population, with 41.5 percent of deaths last year found to be related with heart ailments .

EMR/NCD RISK FACTORS

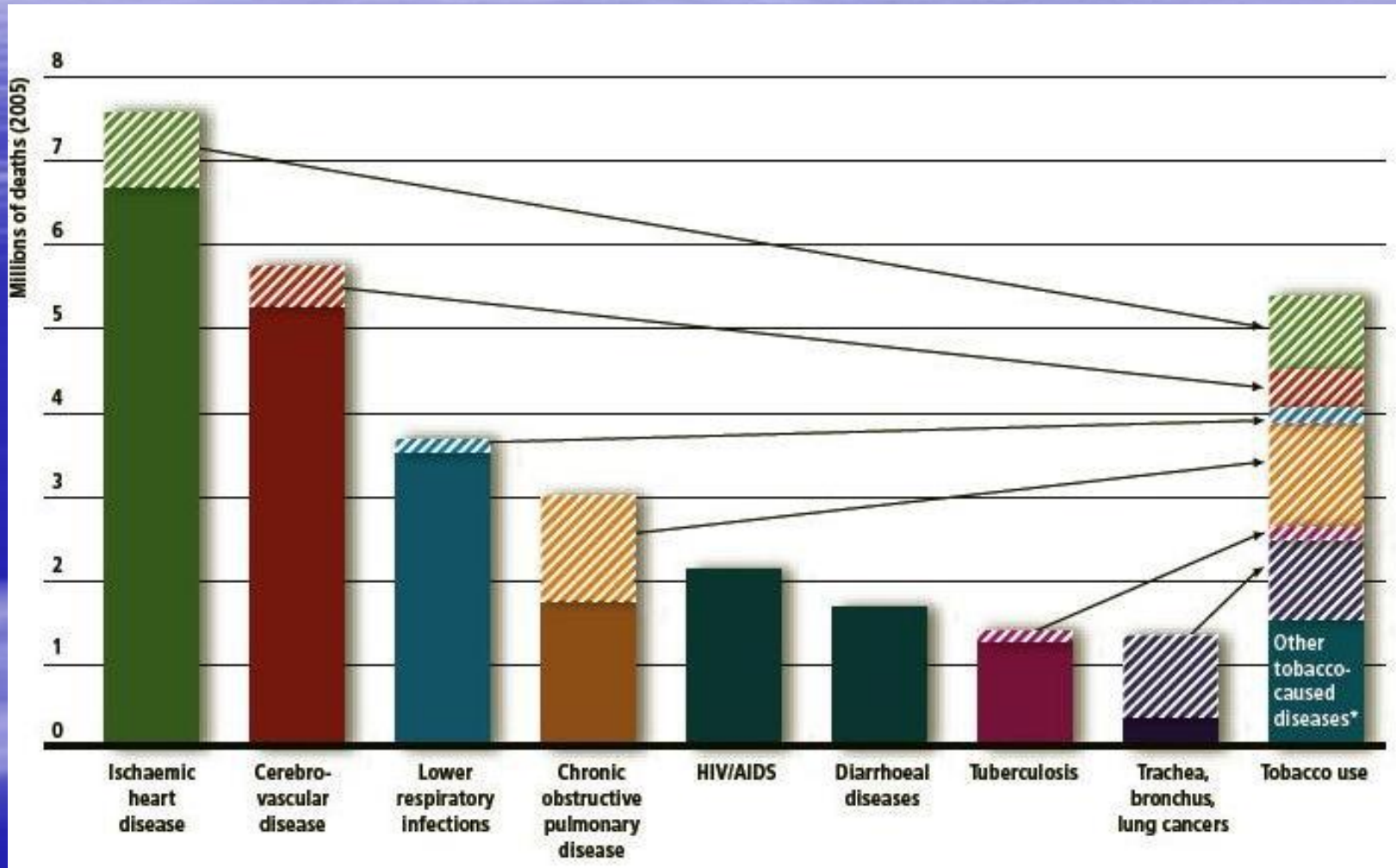
■ Smoking	16-65%
■ Hypertension	12-35%
■ Diabetes	7-25%
■ Over weight-obesity	40-70%
■ Dyslipidemia	30-70%
■ Physical Inactivity	80-90%

Prevalence of Smoking according to STEPwise Survey in EM countries



Noncommunicable Diseases

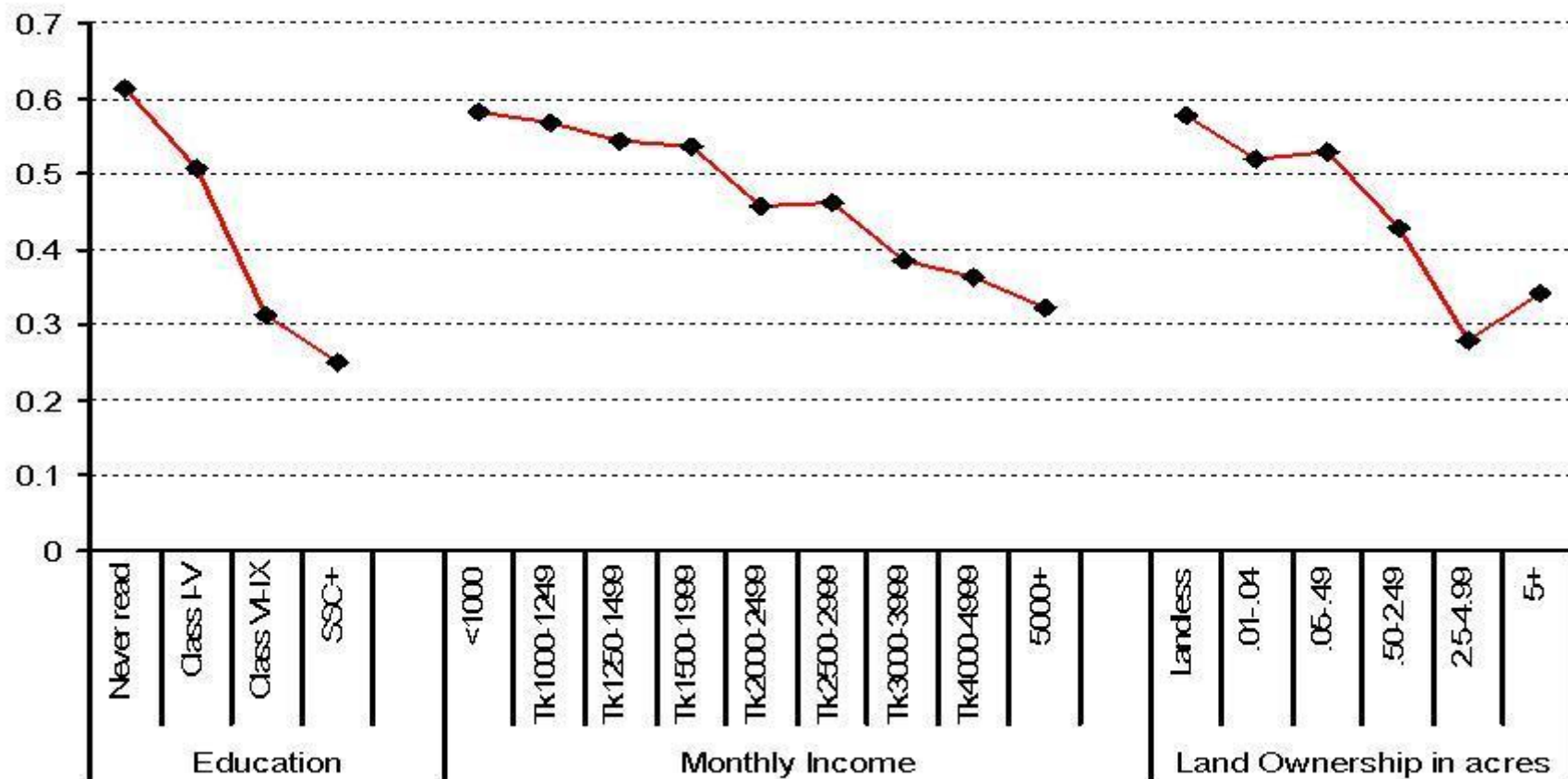
Tobacco is a risk factor for 6 of the 8 leading causes of death



(World Health Statistics, 2008)

Tobacco: The poor and uneducated are the ones who smoke the most

Smoking prevalence in Bangladesh (1995)



Source: Sen, B & Hulme D, 2004

⋮

- The prevalence of cardiovascular disease in Jordan is mostly due to:
- 1-Smoking
- 2- Diet
- 3- Pollution
- according to Bassam Hijjawi, director of the ministry's disease control department.

- He also tied the prevalence of the chronic disease to a lack of exercise, noting that over 60 percent of Jordanians suffering from heart conditions do not participate in physical exercises.

- In Jordan, the average life expectancy in 2016 was 73.5 years, and chronic diseases are becoming increasingly prevalent. Because personal behavior can influence the occurrence and progression of many chronic diseases.

- the Jordan Ministry of Health (JMOH) established surveillance for behavioral risk factors, particularly those related to cardiovascular diseases and diabetes.
- This report summarizes the key findings of the 2002 Behavioral Risk Factor Survey, the first reporting segment in Jordan's surveillance program for chronic diseases.

- The findings indicate that:
- **A- Smoking**
- **B- Physical inactivity**
- **C- Obesity**

contribute substantially to the burden of chronic disease in Jordan and underscores the need for effective public health interventions.

- **Reported by:** *F Shehab, MD, Field Epidemiology Training Program; A Belbeisi, MD, Jordan Ministry of Health. H Walke, MD, Div of International Health, Epidemiology Program Office, CDC.*

**There's no such thing as
a sudden heart attack.
It requires years of preparation.**



Priorities for preventing cardiovascular disease

1. Act on childhood obesity.
2. Reduce saturated fats, trans fats, salt, and refined sugars in processed foods.
3. Provide incentives for production, distribution, and marketing of vegetables, fruit, and unprocessed food.
4. Develop policies to encourage walking, cycling, and other physical activities.

- 5.Improve environmental (including indoor air pollution), occupational, and other contextual risk factors for NCD.
- 6.Accelerate implementation of the Framework Convention on Tobacco Control.
- 7.Provide effective population-wide early detection of those at risk, screening, and programs to raise awareness.
- 8.Take action to reduce the harmful use of alcohol.

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What is diabetes?

- Diabetes mellitus is a group of diseases characterized by high levels of blood glucose resulting from defects in insulin production, insulin action, or both. Diabetes can be associated with serious complications and premature death, but people with diabetes can take steps to control the disease and lower the risk of complications.

Types of diabetes

- **Type 1 diabetes** was previously called insulin-dependent diabetes mellitus (IDDM) or juvenile-onset diabetes.(5-10%).
- **Type 2 diabetes** was previously called non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes. Type 2 diabetes may account for about 90 percent to 95 percent of all diagnosed cases.

- **Gestational diabetes:** After pregnancy, 5 percent to 10 percent of women with gestational diabetes are found to have type 2 diabetes. Women who have had gestational diabetes have a 20 percent to 50 percent chance of developing diabetes in the next 5-10 years.

Prevalance

- The prevalence of diabetes for all age-groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030. The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030. The prevalence of diabetes is higher in men than women, but there are more women with diabetes than men.

The Global burden of diabetes

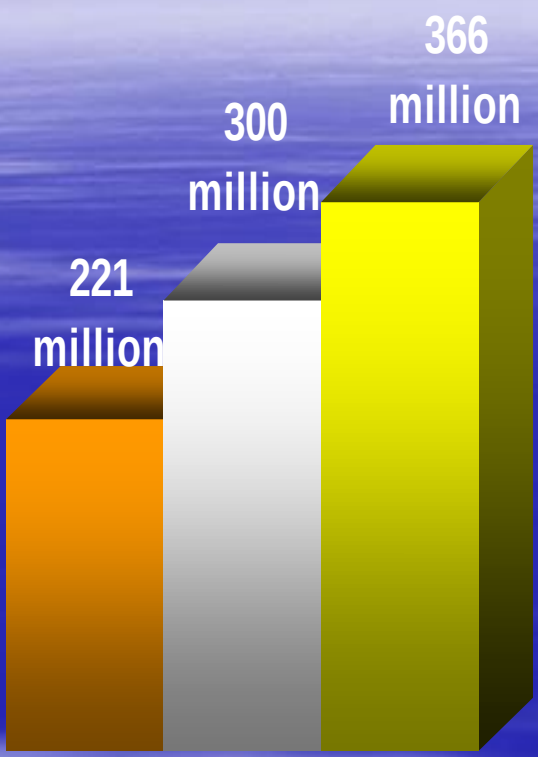
- Diabetes accounts for more than 5% of the global deaths, which are mostly due to CVD.
- Diabetes is responsible for over one third of end-stage renal disease requiring dialysis.
- Amputations are at least 10 times more common in people with diabetes.
- A leading cause of blindness and visual impairment. Diabetics are 20 times more likely to develop blindness than nondiabetics.

Diabetes and Prediabetes

- Type 2 is caused by modifiable risk factors and is the most common worldwide.
- >90% of all adult diabetes cases are Type 2.
- 347 million people worldwide have diabetes.
- More than 80% of diabetes deaths occur in low- and middle-income countries.
- Healthy diet, regular physical activity, maintaining a normal body weight and avoiding tobacco use can prevent or delay the onset of type 2 diabetes.

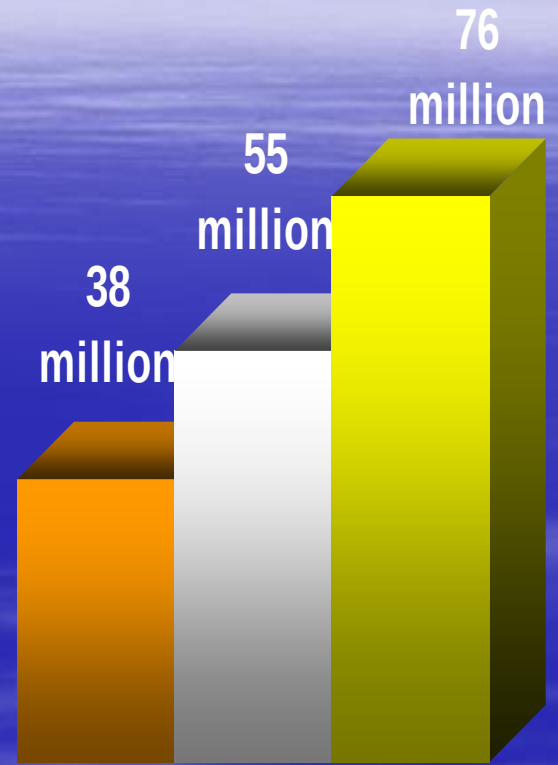
Globally

EMR



Diabetes Number of people aged 20 years and above

2010 2020 2030



Diabetes Number of people aged 20 years and above

2010 2020 2030

Diabetes in Arab World

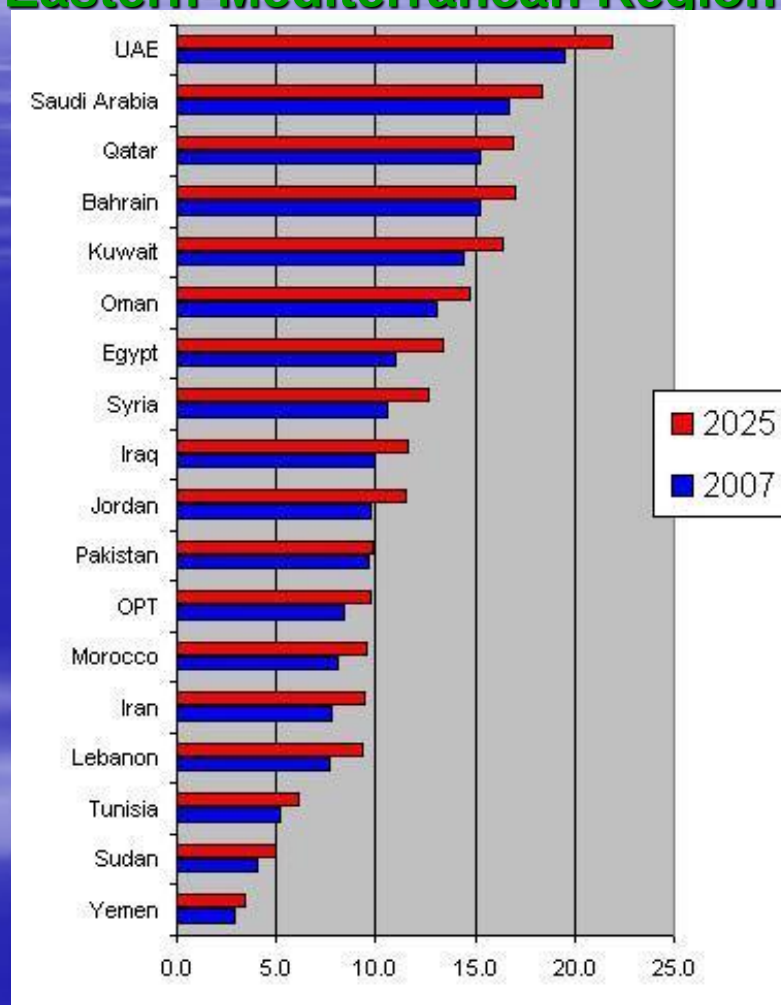
- Diabetes prevalence rates in the Arab World, although dissimilar in different investigations, **are** nevertheless all high.
- Urban residency
- personal incomes and
- economic growth are interrelated, and, in
- connection with affluent food and sedentary
- life-style, are associated with diabetes and obesity rates.

- All Arab countries have experienced various grades of economic growth and urbanisation. However, none of these factors **are** sufficient to explain the increased rates.
- Diabetes 4th cause of death in Jordan and 7th cause of death world wide.

Noncommunicable Diseases

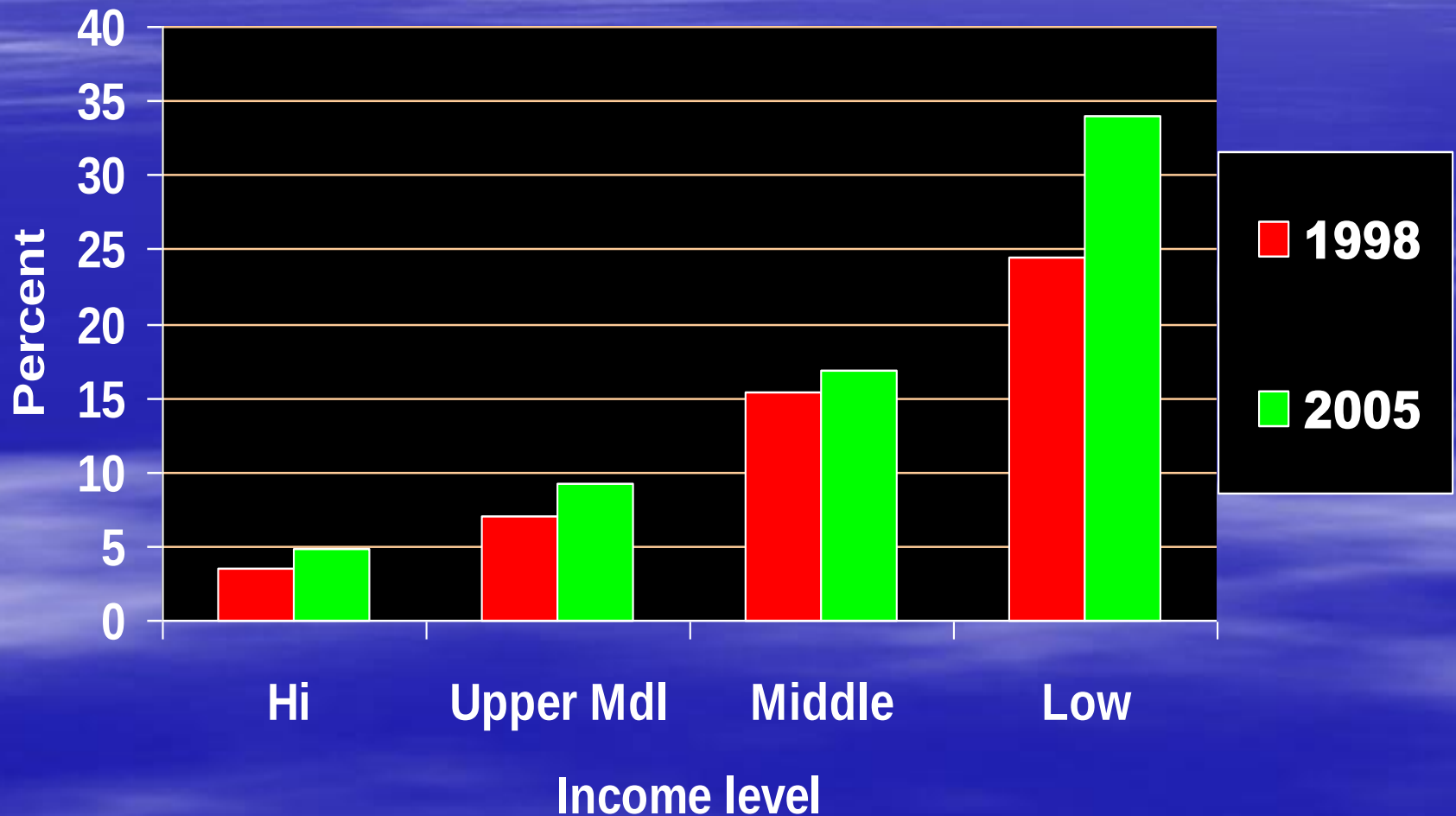
Age-adjusted estimates of diabetes prevalence in the Eastern-Mediterranean Region

(Source: Comparative DM prevalence, table 1.12 and 1.13 of Diabetes Atlas)



s (20-79)

Proportion of family income devoted to diabetes care



Risk Factors

- The risk factors for **type 1 diabetes** are still being researched. However, having a family member with type 1 diabetes slightly increases the risk of developing the disease. Environmental factors and exposure to some viral infections have also been linked to the risk of developing type 1 diabetes

Diabetes type 2: Risk Factors

Major modifiable Risk Factors:

- Unhealthy diets
- Physical Inactivity
- Obesity or Overweight
- High Blood Pressure
- High Cholesterol

Other Modifiable Risk Factors:

- Low socioeconomic status
- Heavy alcohol use
- Psychological stress
- High consumption of sugar sweetened beverages
- Low consumption of fiber

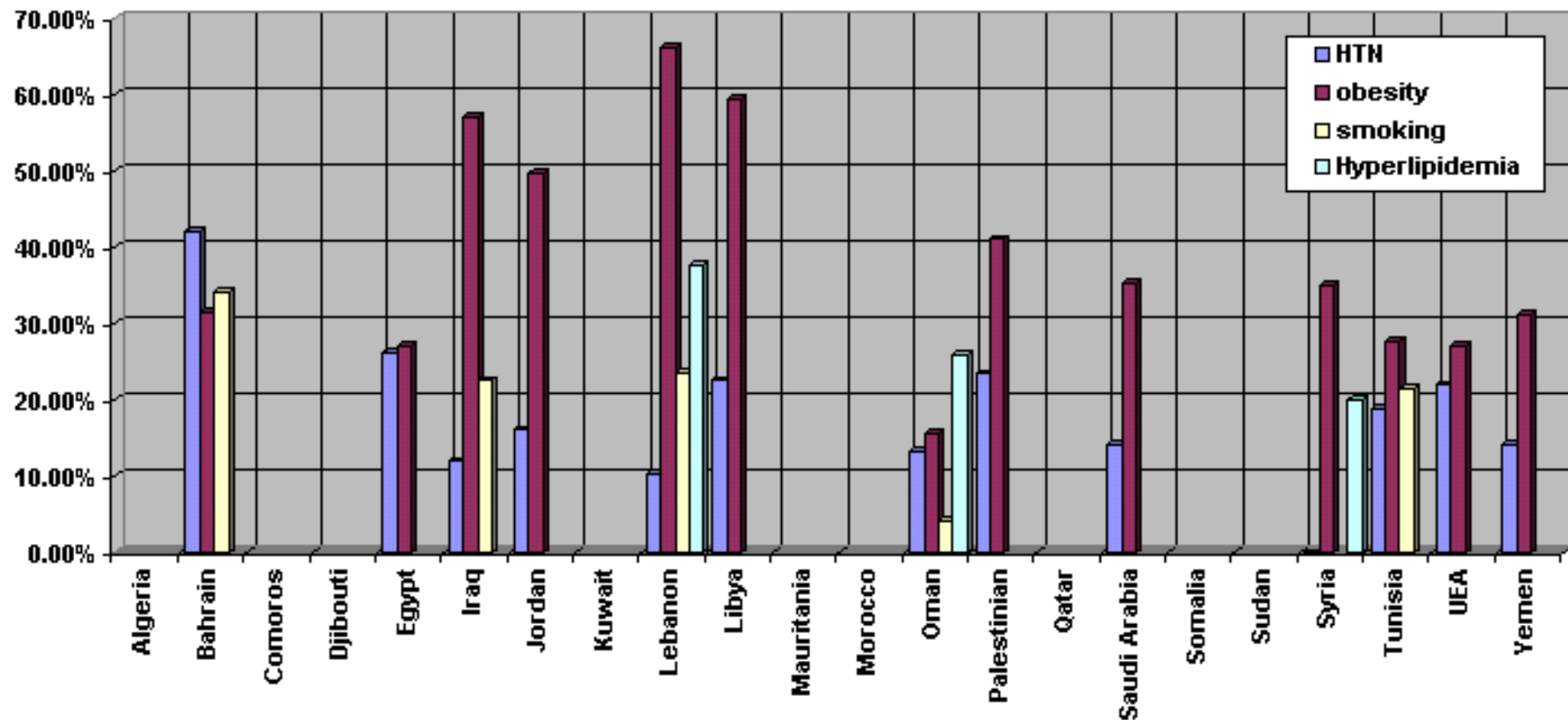
Non-modifiable Risk Factors:

- Increased age
- Family history/genetics
- Race
- Distribution of fat

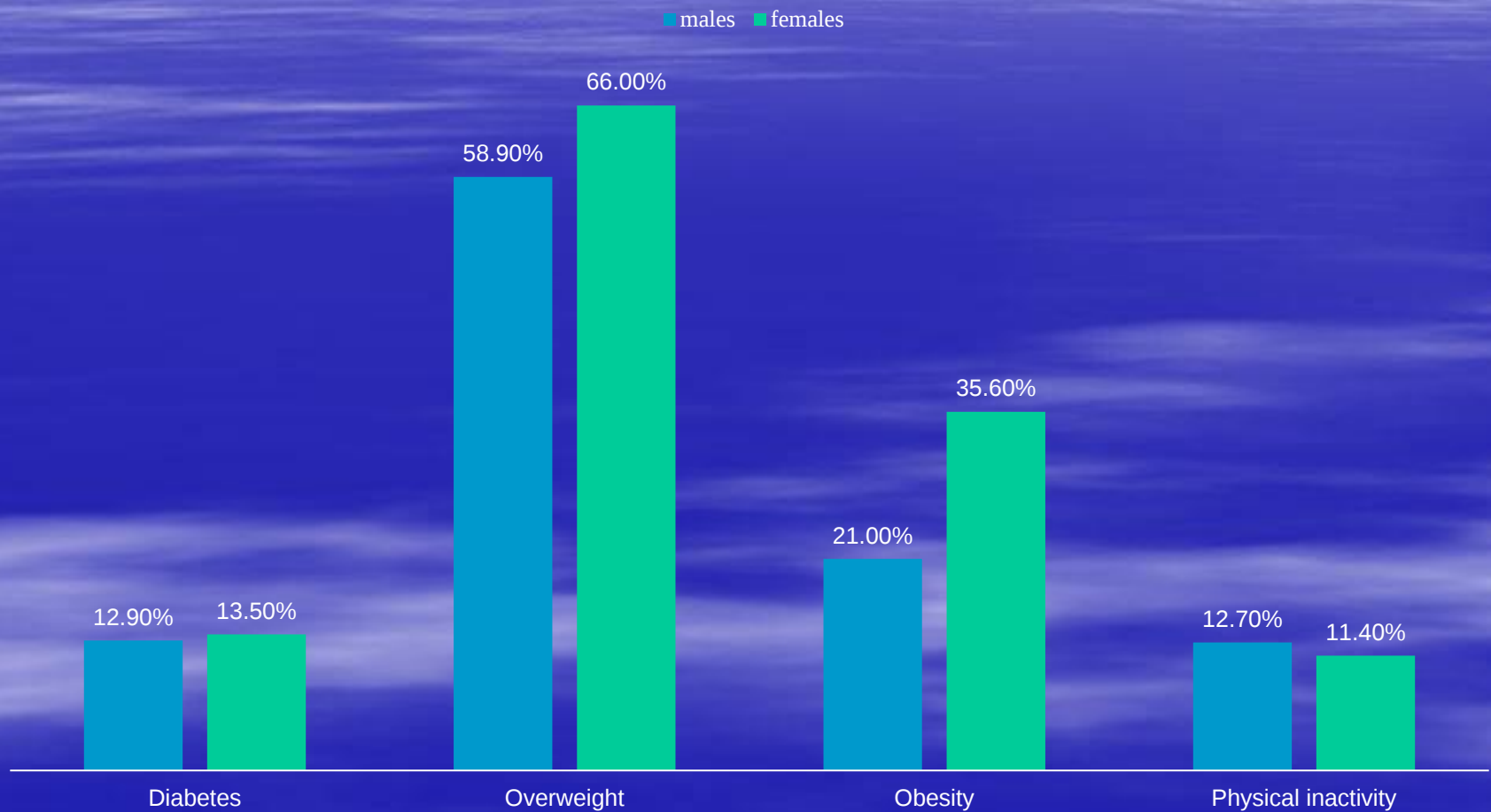
Other Risk Factors:

- Low birth weight
- Presence of auto antibodies

Diabetes Risk Factors



Prevalence of diabetes and related risk factors(Jordan)





The Top 10 countries in overweight and obesity Prevalence In The World – 2017 Update

- #10 – United States – 31.8%
- #9 – Mexico – 32.8%
- #8 – Qatar – 33.1%
- #7 – South Africa – 33.5%
- #6 – United Arab Emirates – 33.7%
- #5 – Jordan – 34.3%

- #4 – Egypt – 34.6%
- #3 – Belize – 34.9%
- #2 – Saudi Arabia – 35.2%
- #1 – Kuwait – 42.8%



Noncommunicable Diseases

Overweight among school children (13-15 yrs old)*

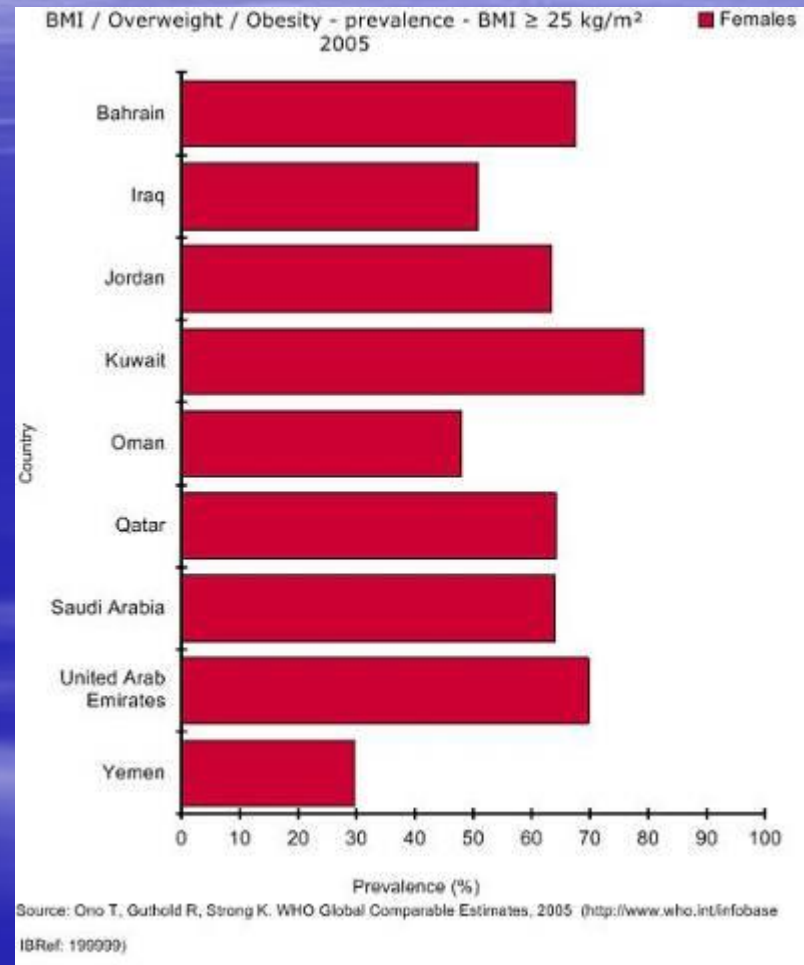
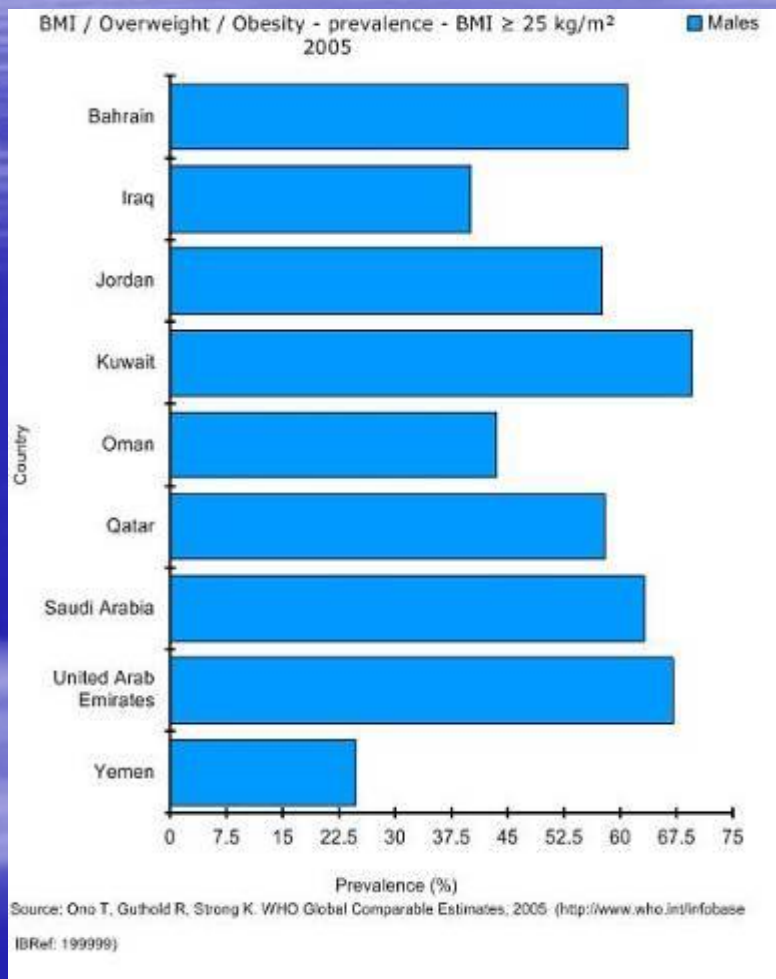
	% overweight or at risk of overweight**
Djibouti	12.3
Egypt	20.6
Jordan	16.8
Lebanon	18.4
Libya	21.7
United Arab Emirates	33.2

*Results from the Global School-based Student Health Survey (<http://www.who.int/chp/gshs/factsheets/en/index.html>)

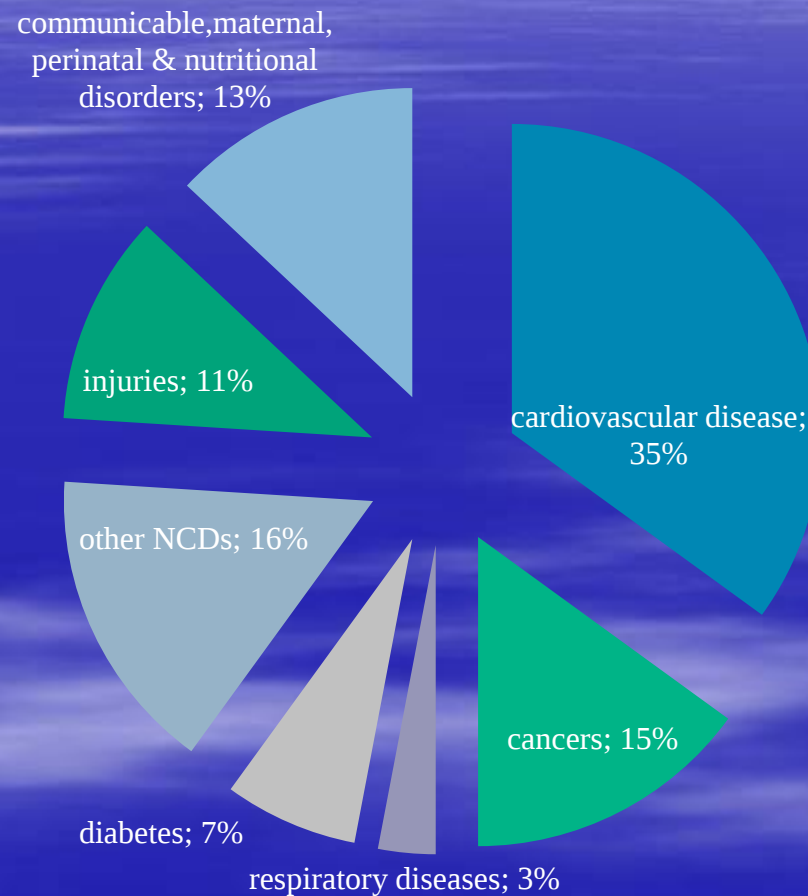
**overweight or at risk of becoming overweight=above the 85th percentile

Noncommunicable Diseases

Adult Overweight and Obesity in Arab Countries



Proportional mortality (% of total deaths, all ages) in Jordan



Complications of Diabetes

- **Heart disease and stroke**
- Heart disease is the leading cause of diabetes-related deaths. Adults with diabetes have heart disease death rates about two to four times higher than adults without diabetes.
- The risk for stroke is two to four times higher among people with diabetes.
- About 65 percent of deaths among people with diabetes are due to heart disease and stroke.

- **High blood pressure**

- About 73 percent of adults with diabetes have blood pressure greater than or equal to 130/80 mm Hg or use prescription medications for hypertension.

- **Blindness**

- Diabetes is the leading cause of new cases of blindness among adults aged 20-74 years.
- Diabetic retinopathy causes 12,000 to 24,000 new cases of blindness each year.

Kidney disease

- Diabetes is the leading cause of end-stage renal disease, accounting for 44 percent of new cases.
- In 2001, 42,813 people with diabetes began treatment for end-stage renal disease.
- In 2001, a total of 142,963 people with end-stage renal disease due to diabetes were living on chronic dialysis or with a kidney transplant.

Nervous system disease

- About 60 percent to 70 percent of people with diabetes have mild to severe forms of nervous system damage. The results of such damage include impaired sensation or pain in the feet or hands, slowed digestion of food in the stomach, carpal tunnel syndrome, and other nerve problems.

Amputations

- More than 60 percent of nontraumatic lower-limb amputations occur among people with diabetes.

- **Dental disease**

- Periodontal (gum) disease is more common among people with diabetes. Among young adults, those with diabetes have about twice the risk of those without diabetes.
- Almost one-third of people with diabetes have severe periodontal diseases with loss of attachment of the gums to the teeth measuring 5 millimeters or more.

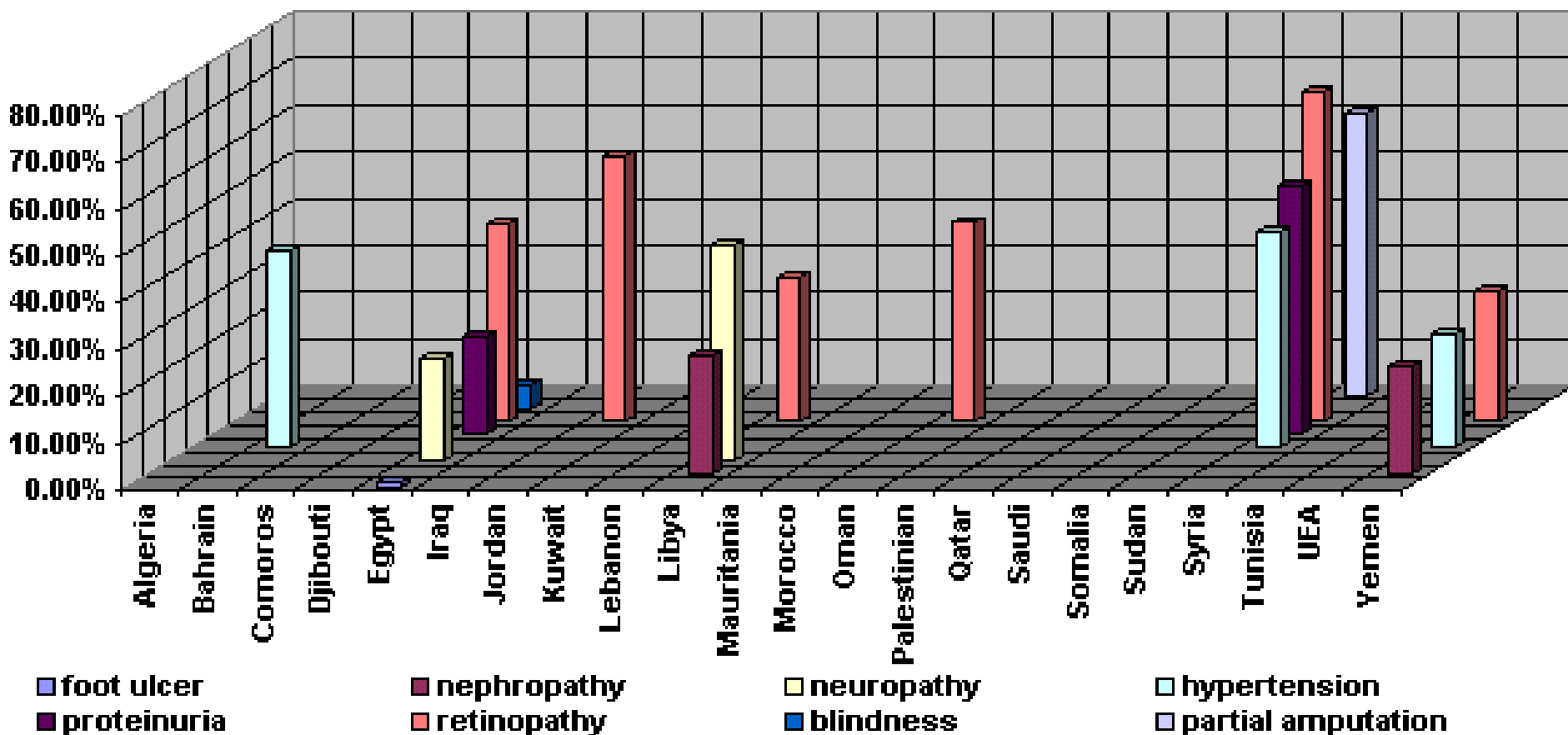
Complications of pregnancy

- Poorly controlled diabetes before conception and during the first trimester of pregnancy can cause major birth defects in 5 percent to 10 percent of pregnancies and spontaneous abortions in 15 percent to 20 percent of pregnancies.
- Poorly controlled diabetes during the second and third trimesters of pregnancy can result in excessively large babies, posing a risk to the mother and the child.

Other complications

- Uncontrolled diabetes often leads to biochemical imbalances that can cause acute life-threatening events, such as diabetic ketoacidosis and hyperosmolar (nonketotic) coma.
- People with diabetes are more susceptible to many other illnesses and, once they acquire these illnesses, often have worse prognoses. For example, they are more likely to die with pneumonia or influenza than people who do not have diabetes.

Diabetes Complications

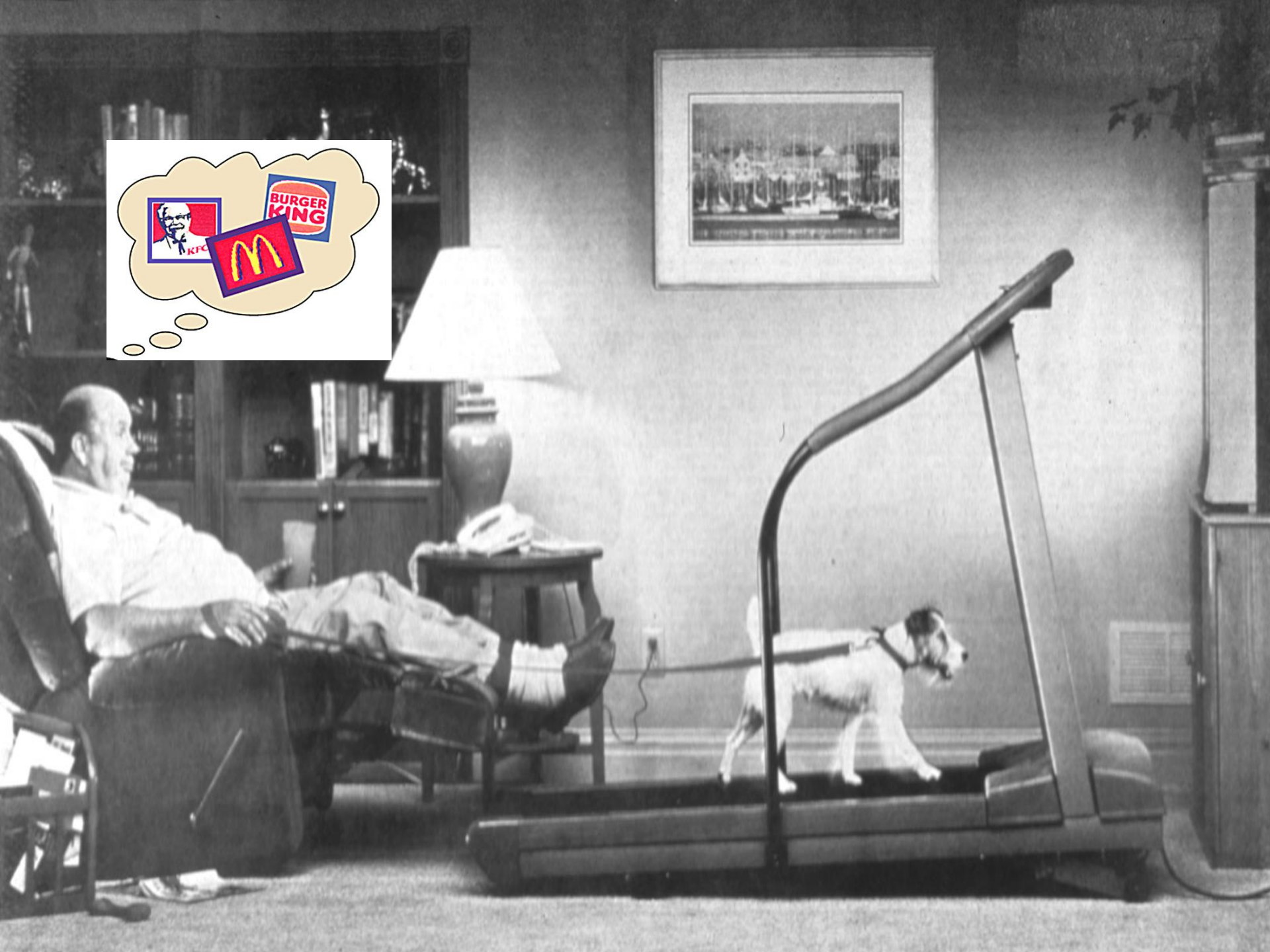


Prevention

- Whatever your risk factors for diabetes may be, there's a lot you can do to delay or prevent diabetes. To manage your risk of diabetes, you should:
- **manage your blood pressure**
- **keep your weight within or near normal ranges**
- **get moderate exercise on most days**
- **eat a balanced diet**

Prevention

- Lifestyle interventions included diet and moderate-intensity physical activity (such as walking for 2 1/2 hours each week). In the Diabetes Prevention Program, a large prevention study of people at high risk for diabetes, the development of diabetes was reduced 58 percent over 3 years.



Key facts

- Noncommunicable diseases (NCDs) kill 41 million people each year, equivalent to 71% of all deaths globally.
- Each year, 15 million people die from a NCD between the ages of 30 and 69 years; over 85% of these "premature" deaths occur in low- and middle-income countries.
- Cardiovascular diseases account for most NCD deaths, or 17.9 million people annually, followed by cancers (9.0 million), respiratory diseases (3.9million), and diabetes (1.6 million).

- These 4 groups of diseases account for over 80% of all premature NCD deaths.
- Tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets all increase the risk of dying from a NCD.
- Detection, screening and treatment of NCDs, as well as palliative care, are key components of the response to NCDs.

Chronic Diseases 2

- Disability or chronicity may be the outcome of many of these chronic diseases and they will not be accounted for by using the mortality indicators as the only indicators for these chronic and degenerative diseases is the resulting disabilities rates

Examples :

- **1- Musculo-skeletal problems**
- Osteoporosis
- Arthritis and osteoarthritis which may reach in old age a prevalence of 600/1000 persons, and over 300/1000 persons in males.
- Rheumatoid arthritis
- Low back pain
- Foot problems in old age
- Scoliosis in children
- Congenital hip dislocation

2- Neurological disorders

- Cerebral palsy
- Mental retardation
- Epilepsy and other seizure disorders
- Headache and migraine
- Multiple sclerosis
- Alzheimer and dementia
- Parkinson disease.

Psychiatric Disorders

- Psychosis
 - Schizophrenia
 - 6--Affective psychosis
 - 4--Unspecified psychosis
 - 3--Senile & pre-senile dementia
- 3--Psychosis associated with other cerebral conditions¹



Neuroses.

- Phobias
- Anxiety
- Depression
- Obsessive Compulsive Neuroses.
- Personality disorders & other non-psychotic mental disorders

6- Genetic disorders

- – Down's syndrome
- Autosomal recessive defect chromosome 7 mutations are thought to be responsible for that disease .
- Cystic fibrosis : is the most lethal in Northern European descent (1/3500 births) in USA (1/14,000 births in Blacks) in Asian Americans 1/25,500 births , Median survival age for C.F. improved between 1938 and 1998 from 5 y to almost 30 y .

In Conclusion: Barrier to Development

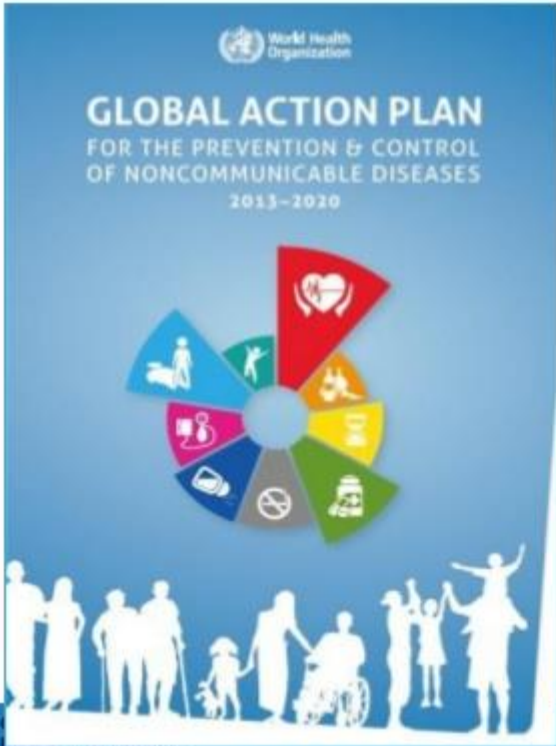
- **CVDs and other NCDs Will Further Widen the Health Gap between Rich and Poor Countries**
- **They Are Killing and Disabling People at Their Peak Productivity**
- **They Will Slow Economic Growth Rates in Poor Countries**

Global Action Plan for the Prevention and Control of NCDs 2013-2020

- the 66th World Health Assembly endorsed the WHO Global Action Plan for the Prevention and Control of NCDs 2013-2020 (resolution WHA66.10).
- To strengthen national efforts to address the burden of NCDs.
- The global action plan offers a paradigm shift by providing a road map and a menu of policy options for Member States.
- will attain 9 voluntary global targets, including that of a 25% relative reduction in premature mortality from NCDs by 2025.

Global Action Plan for the Prevention and Control of NCDs 2013-2020

The WHO Global NCD Action Plan 2013-2020
unites governments, international partners and WHO around a common agenda



GLOBAL ACTION PLAN
FOR THE PREVENTION & CONTROL
OF NONCOMMUNICABLE DISEASES
2013-2020

Vision:
A world free of the avoidable
burden of NCDs

Goal:
To reduce the preventable and
avoidable burden of morbidity,
mortality and disability due to
NCDs by means of
multisectoral collaboration and
cooperation at national,
regional and global levels

Geneva, 1-2 July 2013

World Health Organization

Six Objectives For The Action Plan

The WHO Global NCD Action Plan 2013-2020 has six objectives with recommended actions for Member States, international partners and WHO

fact

Objective 1
To strengthen international cooperation and advocacy to raise the priority accorded to prevention and control of NCDs in the development agenda and in internationally-agreed development goals



Objective 2
To strengthen national capacity, leadership, governance, multisectoral action and partnerships to accelerate country response for the prevention and control of NCDs



Objective 3
To reduce exposure to modifiable risk factors for NCDs through creation of health-promoting environments



Objective 4
To strengthen and orient health systems to address the prevention and control of NCDs through people-centred primary health care and universal health coverage



Objective 5
To promote and support national capacity for high-quality research and development for the prevention and control of NCDs

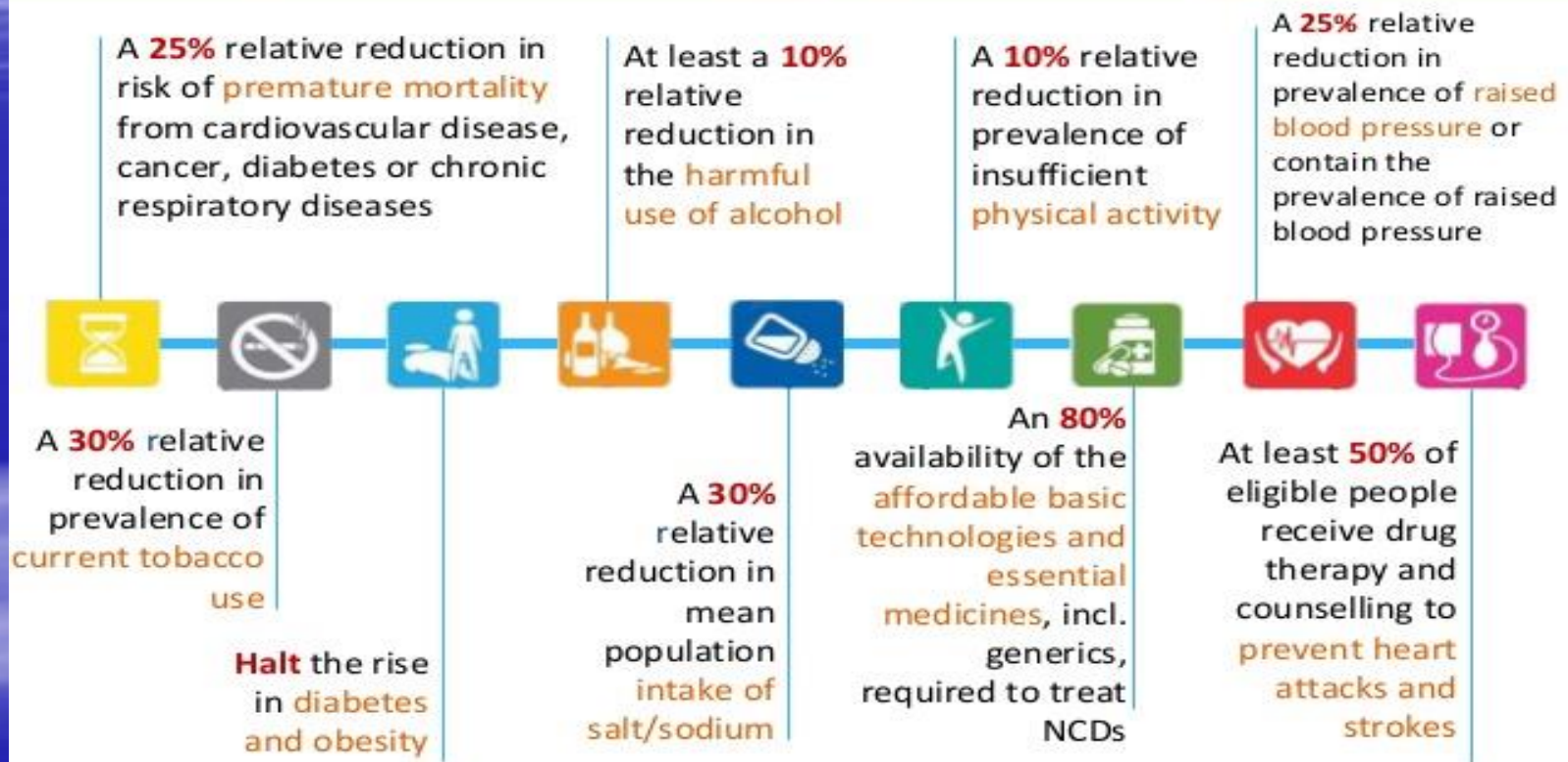


Objective 6
To monitor the trends and determinants of NCDs and evaluate progress in their prevention and control



9 Global NCD Targets

Where to focus: 9 global NCD targets



Challenges

- For the growing populations and rapidly changing lifestyles have outstripped health care systems, and available infrastructure is simply unable to cope.
- All relevant government departments (not simply health but finance, agriculture, trade, environment, education, etc.) And civil society should counter force NCDS.
- The emphasis should be on public health and preventive measures (raising the prices of alcohol and tobacco, banning smoking in public places, taxing sugar-sweetened beverages, and designing transport systems that encourage physical activity).

Challenges

- Citizens and patients should be “in charge” by taking responsibility for their care rather than depending passively on clinicians.
- health care should be provided within primary care.
- There should be extensive use of standardized protocols and guidelines.

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THANK YOU

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