Epidemiology of Non-Communicable Diseases

-The non-communicable diseases are important to improve and expand our health care services

-the non-communicable diseases are main cause of death in Jordan and all the developed countries .

- non-communicable diseases are medical conditions or diseases that are noninfectious or non-transmissible.

if you remember when we talked about primary health care the causes of death in high income and middle income countries was the non communicable disease and in poor and low income was infectious diseases but now the non communicable disease emerging to the developing world because their life expectancy is increasing but also we need to deal with the infectious disease in the developing world because the complication and death is high (the major factor that increase the rate of infectious disease is immunity and immunity related to malnutrition) .

-in Jordan the life expectancy in 1960 was 49 but now is 73 years

-we need to know the risk factor rather than the causes of non-communicable diseases and by preventing and promoting the risk factor we will decreases the mortality of diseases

✓ *Chronic diseases have been defined as :*

Chronic illnesses that last for long periods of time and progress slowly.

- Non-Communicable.

Degenerativein origin (the most of non-communicable diseases 80 % happen in elderly people and, also there is chronic diseases happen in children due to schools like diabetes, sclerosis ,bronchial asthma, some skeletal and muscular deformities and congenial abnormality like down syndrome . Usually these diseases are untreatable but they can be controlled by a long-term management.
- Some of these diseases include diabetes, hypertension, and many neurological diseases including Alzheimer's and Parkinson's.

✓ *Characteristics of chronic diseases :*

- Uncertain etiology (The main cause is unclear , unknown) .
- multiple risk factors.
- long latency period is the period between exposure and contact of the causative agent with susceptible host to the onset and appearance of first sign and symptoms so they need screening in order to detect them.
< patient with hypertension came in late stage and he complains from headache or cerebrovascular accident (silent disease) >
<patient with ischemic heart disease come in late stage and he complains of chest pain -

breast cancer become symptomatic in grade two or three (These diseases are asymptomatic so they need screening) >.
- Prolonged course of illness.
- non- contagious origin.
- functional disability and sometimes incurability like diabetes it can cause blindness and renal failure and some time they are incurable like diabetes we can't cure this disease (we only control it) .

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 .

Example: smoking is highly risk factor in (cancer- cardiovascular -chronic obstructive airway disease) we will choose the high relatively risk factor which is chronic obstructive airway disease.

The most important risk factor for these diseases is tobacco smoking (Its very important to know the risk factor to prevent the disease)

✓ *Strategies for the prevention of chronic diseases:*

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.
- done on all of the individuals in the community by changing some behaviors to avoid the risk factors such as providing good nutrition and preventing smoking .
- prevention of disease occurrence by altering susceptibility of the host or reducing exposure of susceptible persons to the risk factors .
- Examples : immunization against Hepatitis and H. pylori that may develop into malignancies (it's for infectious disease the doctor mentioned it as primordial because there is some chronic infectious disease may cause failure like tuberculosis its chronic infectious that cause pulmonary disease or may cause lung cancer. Another example is hepatitis which cause cirrhosis and H.pylori which cause ulceration and both of them may transform to cancer) , good nutrition , health education, counseling, environmental sanitation, purification of water , protection against accidents at work place and seat belts...
all of these are Primordial preventive surfaces , Improve the nutrition and the Physical activity even if the patient is in high risk for hypertension or cardiovascular ,prevent smoking even if the patient in high risk for lung cancer .
- Requires : accurate knowledge of causative agent and process of disease.
SO primordial before the risk factors an disease appeared)

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 , colon-rectal cancers, lung cancer .
we work on the risk factor for example eating high fatty food will cause hypercholesteremia and cardiovascular disease so we try to providing a low fat and salt diet result in decrease the risk for developing cardiovascular diseases and high blood pressure).
Also, preventing smoking reduces the risk of developing lung cancer and controlling obesity reduces the risk for developing diabetes.

3- Secondary prevention : Modifying the risk factors in the presence of the manifested disease for people who are already at a high risk for developing certain diseases by changing their lifestyle.

4- Tertiary Prevention : alleviation and limitation of disability improvement of quality of life , Rehabilitation and follow up (to prevent the complication of the disease like diabetic patient has Gangrene so to protect the patient we should do amputation , if a patient had a cerebrovascular accident, we try to prevent paralysis.) .

- Non communicable diseases are usually result from chronic conditions such as Hepatitis B, Hepatitis C and H. pylori in the stomach and they don't result from acute infections . they are long term disease which they are chronic infections and can transform to cancer.

- 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 are the most common cause of death in the developing area (in Jordan 40% are due to cardiovascular diseases including ischemic heart disease and cerebrovascular accidents.) .

- Chronic Obstructive Pulmonary Disease .

- Diabetes - Hypertension . - Cancers
- Accidents in its different types which result in long-term deformities and injuries.

- 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 like schizophrenia and Alzheimer`s.

- Non communicable diseases are the leading cause of functionary 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 Like Jordan .

- Main causes of deaths in Jordan include: Cardiovascular diseases (40%), Cancers (13%), Accidents . which are noncommunicable diseases and 75% of deaths in the world are due to noncommunicable diseases.

- 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.

- Out of the non-communicable diseases, cardiovascular or coronary heart diseases and stroke are the leading cause of morbidity and mortality worldwide (more than 50% of deaths) 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 .

- 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 because their services are poor , further hindering their social and economic development . Low income countries suffer from poor nutrition and status, poor vaccination, overcrowding and poor housing and because of that, anyone who lives in a developing country and gets a non-communicable disease dies earlier than people in developed countries, however, if these diseases are controlled life expectancies increase.

- 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 (by vaccination and nutrition) , conditions related to childbirth and nutrition, changes in lifestyle factors (eg, smoking), and population aging . < Another important factor for having a non-communicable disease is aging>

- If life expectancy increases the incidence of non communicable diseases will increase .

- 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.

- In 2005, Jordan’s population was approximately 5.5 million. By 2050, the population is expected to increase to between 8.5 and 14.8 million people. The proportion of older people (aged 60 years or older) is expected to be 15.6% (or approximately 1.8 million people) in 2050, more than 5 times that in 2000 .

- Non-communicable diseases are connected forming a complicated net. For example: hypertension, hypercholesterolemia and diabetes increase the risk for developing cardiovascular

diseases and diabetes increase the risk for developing renal failure .

- ✓ *NCDs work in complicated net , hypertensive patient at higher risk to get ischemic heart disease and diabetes... diabetic patient at higher risk to get renal failure:*

- During 2005, NCDs accounted for more than 50% of all deaths in Jordan. Heart disease and stroke (International Statistical Classification of Diseases, 10th Revision, codes I00-I99) accounted for 35% of all deaths; malignant neoplasms (C00-C97) were responsible for 13% of deaths .

- Cancer is a growing health problem in developing countries also, where more than half of the global total of six million deaths occur but its underestimated and many people in developing countries die because there was no early diagnosis although new technologies can detect cancer easily. Also screening for hypertension and preventing it can decrease the risk of developing heart disease. <family history is the main risk factor for breast cancer > .

- ✓ *Heart disease is a leading cause of health n Jordan :*

- Heart disease has become a leading threat to the health of the Jordanian population, with 41.5 percent of deaths last year 30% of them related with heart disease. .

- " This number is much higher than 10 years ago ."

- *The most important risk factor for developing cardiovascular diseases in Jordan is diet, then comes smoking. Also, pollution and lack of exercise and low physical activity can increase the risk for developing cardiovascular disease.* according to Bassam Hijjawi, director of the ministry's disease control department.

- Risk Factors for CVD :

1- Non modifiable Risk Factors: family history , ethnicity and age.
2- Modifiable risk factors includes: Tobacco exposure, high blood pressure (hypertension), high cholesterol (hypercholesterolemia) , obesity, physical inactivity, diabetes, unhealthy diets, and harmful use of alcohol

- 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 2012 was 73 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.*

✓ *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 .

✓ *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.

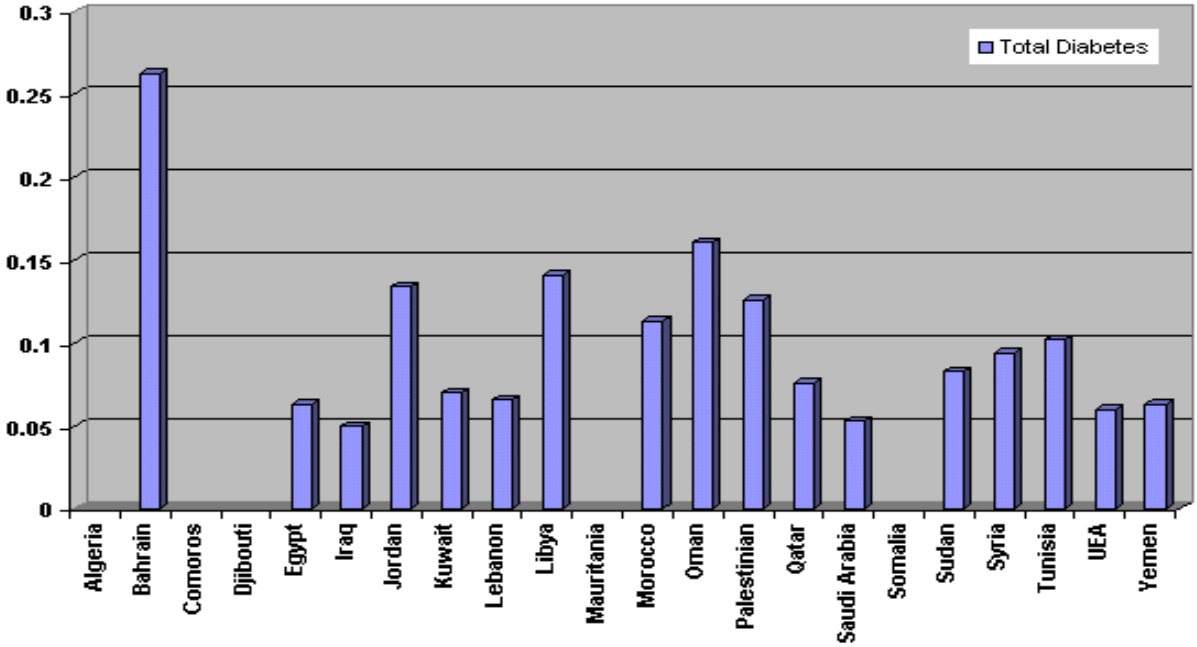
- Poorly controlled diabetes during the second and third trimesters of pregnancy can result in excessively large babies, posing a risk to the mother and the child.

✓ *Other complications :*

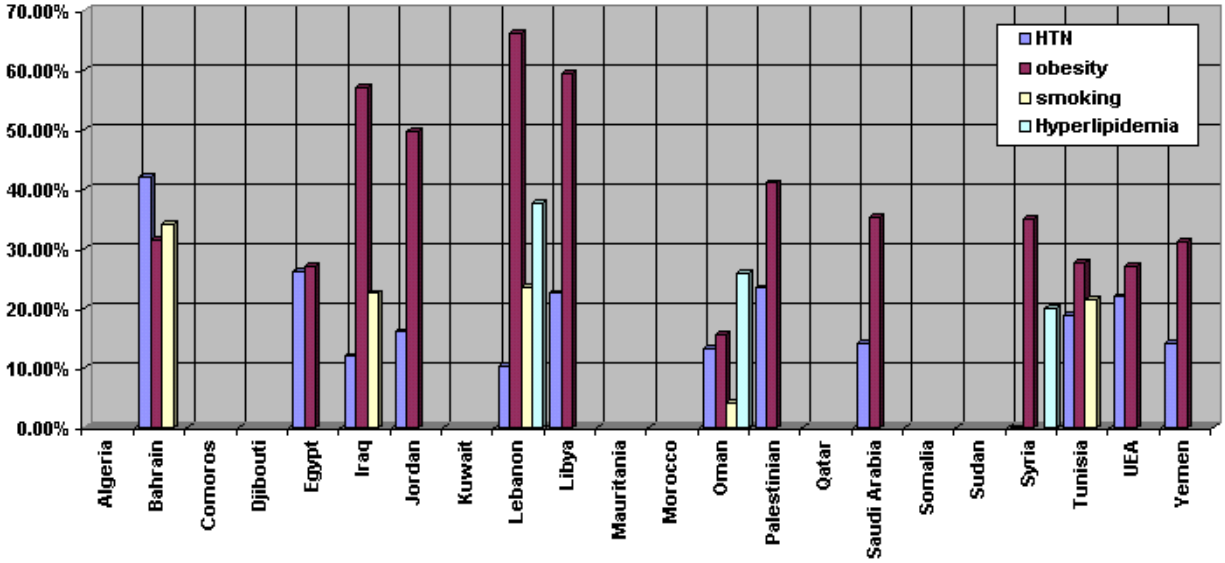
- Uncontrolled diabetes often leads to biochemical imbalances that can cause acute life-threatening events, such as diabetic ketoacidosis and hyperosmolar (nonketotic) coma.

- 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.

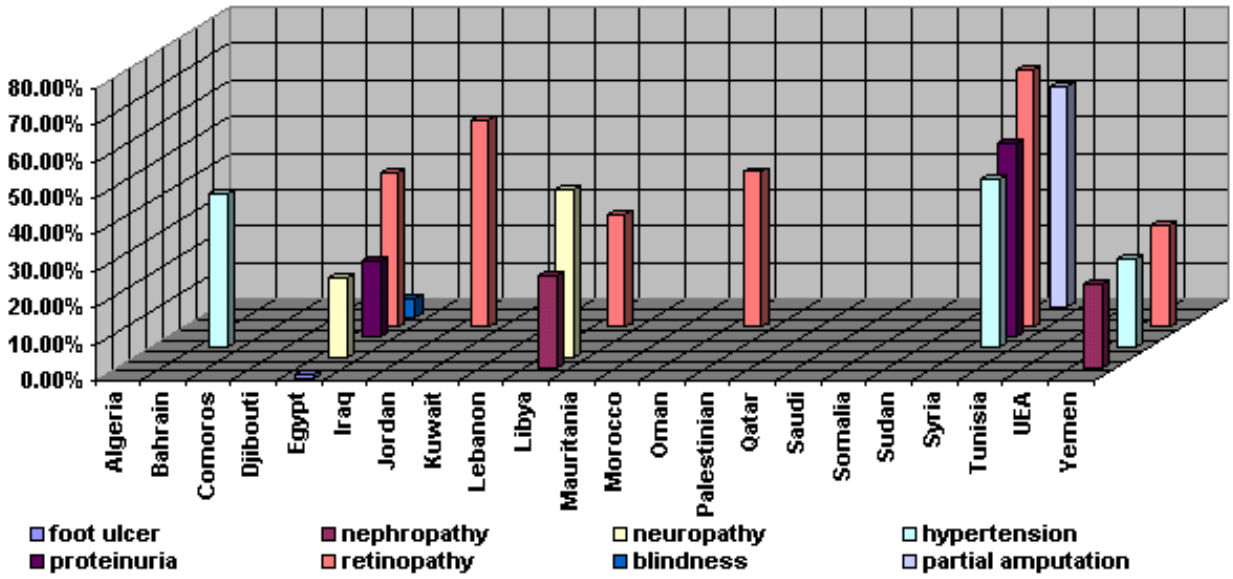
✓ *Prevalence of diabetes in Arab World :*



✓ *Diabetes Risk Factors*



✓ *Diabetes Complications*



✓ *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-sketelal problems

- Osteoporosis
- Artihritis 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.

3- Psychiatric Disorders

- Psychosis
- Schizophrenia
- 6--Affective psychosis
- 4--Unspecified psychosis
- 3--Senile & pre-senile dementia

3--Psychosis associated with other cerebral conditions1

4- Neuroses

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

5- 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 Blocks) 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 .