Risk factors of NCDs

- **Objectives :**

1- Definition of risk factors and metabolic risk factors.

2- Common risk factors for NCDs.

3- More in-depth discussion on 4 leading NCDs, 4 behavioral/lifestyle risk factors, and 4 metabolic risk factors:

  - Definition
  - Global burden
  - Health effects

Done by : **Saleh Mahjoub - Noura Alothaim - Alanoud Alessa - Rahaf Alshunaiber**

Team leader: **Afnan Almustafa & Saif Almeshari**

Reviewed by: **Aseel Badukhon**

- **Resources :**
  Slides.
  Doctor's notes.

[Colors index : Important | Notes | Note | Slides | Extra] [Editing file | Share note]

Types of NCDs

- Cardiovascular disease the major killer (e.g., Coronary heart disease, Stroke)
- Cancer
- Chronic respiratory disease
- Diabetes
- Chronic neurologic disorders (e.g.,Alzheimer's, dementias)
- Arthritis/Musculoskeletal diseases back pain especially.
- Unintentional injuries (e.g., from traffic crashes)

Risk Factors

An aspect of personal behavior or lifestyle, an environmental exposure, or a hereditary characteristic that is associated with an increase in the occurrence of a particular disease, injury, or other health condition.

Modifiable Risk Factor

A behavioral risk factor that **<u>can</u>** be reduced or controlled by intervention, thereby reducing the probability of disease. You can prevent it.

WHO has prioritized the following four:

- Physical inactivity
- Tobacco use
- Alcohol use Harm depends on the amount and frequency of use
- Unhealthy diets (increased fat and sodium, with low fruit and vegetable intake)

Non-Modifiable Risk Factor

A risk factor that **<u>cannot</u>** be reduced or controlled by intervention

for example:

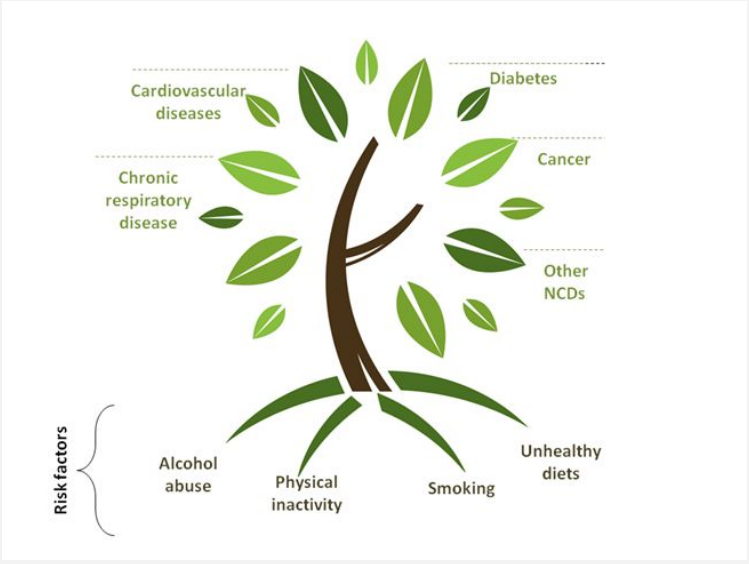
- Age
- Gender
- Race
- Family history (genetics)

Common Risk Factors

Metabolic Risk Factors

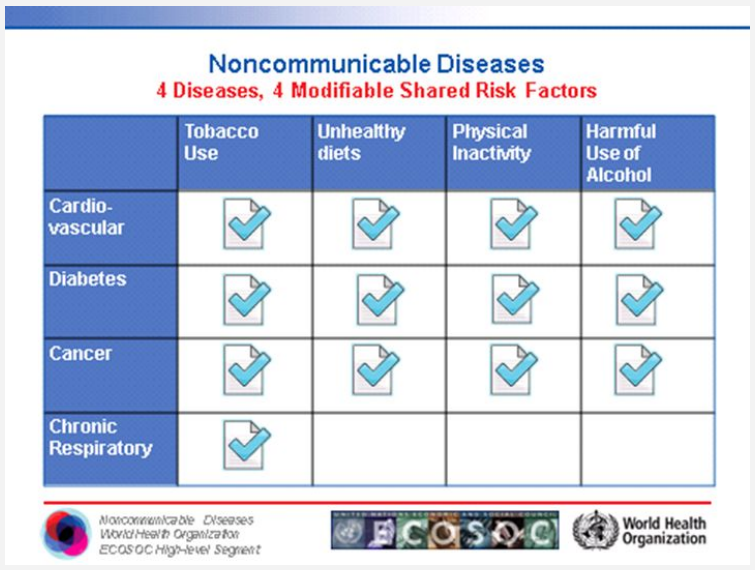
- “Metabolic" refers to the biochemical processes involved in the body's normal functioning
- Behaviors (modifiable risk factors) can lead to metabolic/physiologic changes.
- WHO has prioritized the following four metabolic risk factors:
  1. Raised blood pressure
  2. Raised total cholesterol
  3. Elevated glucose
  4. Overweight and obesity > It leads to inflammation

FOUR LEADING NCDs



Common Risk Factor

These leading killers share the same risk factors



WHO Website

Global Health Observatory (GHO): http://www.who.int/gho/en/

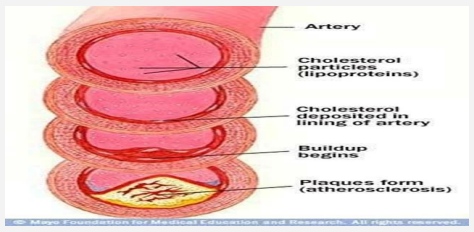
- Provides data and analyses on global health priorities
- Noncommunicable diseases
  - Mortality/morbidity
  - Risk Factors
- Country statistics: health data and statistics for countries

Media centre fact sheets: http://www.who.int/mediacentre/factsheets/en/

- Key facts
- Symptoms
- Risk factors
- Burden of disease

Cardiovascular Disease

Definition



Cardiovascular disease (CVD) is a group of disorders of the heart and blood vessels, and may include:

Coronary heart disease	Disease of the blood vessels supplying the heart muscle
Cerebrovascular disease "stroke"	Disease of the blood vessels supplying the brain
Peripheral arterial disease	Disease of blood vessels supplying the arms and legs
Congenital heart disease	Malformations of heart structure existing at birth not the main focus.

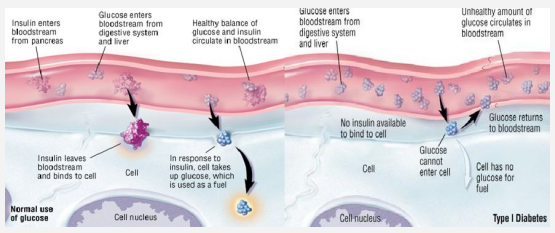
Global Burden

- CVDs are the #1 cause of death globally.
- An estimated 17.3 million people died from CVDs in 2008. (30% of all global deaths)
- 7.3 million were due to coronary heart disease
- 6.2 million were due to stroke
- Over 80% CVD deaths occur in low- and middle- income countries > less knowledge.
- By 2030, almost 25 million people will die from CVDs.

Diabetes

Definition

- Diabetes is a disorder of metabolism— the way the body uses digested food for growth and energy.
  You can't prevent TYPE 1.
- There are 4 types:
  - Type 1
  - Type 2
  - Gestational
  - Pre-Diabetes (Impaired Glucose Tolerance)
- Type 2 is caused by modifiable risk factors and is the most common worldwide.
- >90% of all adult diabetes cases are Type 2



Diabetes

Global Burden

- 347 million people worldwide have diabetes.
- In 2004, an estimated 3.4 million people died from consequences of high blood sugar.
- More than 80% of diabetes deaths occur in low- and middle-income countries.
- WHO projects that diabetes deaths will increase by two thirds between 2008 and 2030.
- Healthy diet, regular physical activity, maintaining a normal body weight and avoiding tobacco use can prevent or delay the onset of type 2 diabetes.
- You don't have to memorize the epidemiology.

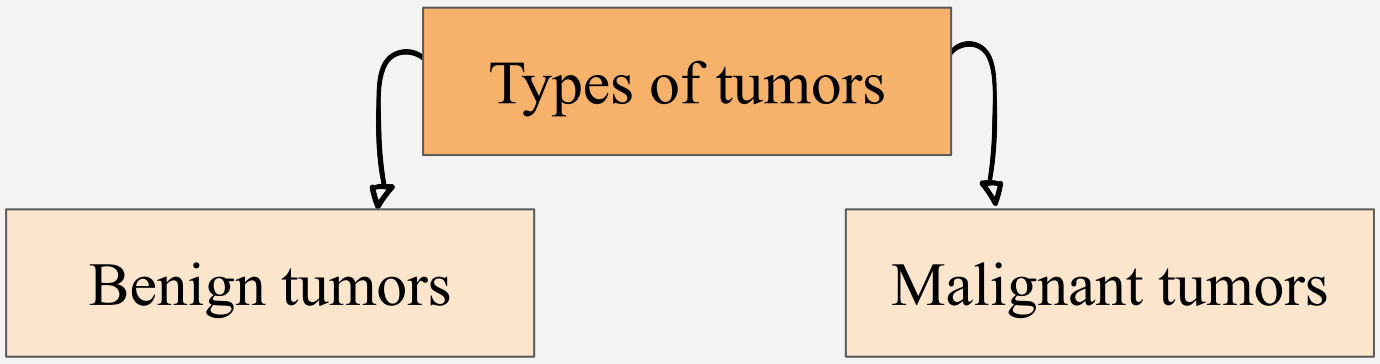
Risk Factors of CV diseases & Diabetes

Major modifiable	Other modifiable
- Unhealthy diets - Physical Inactivity - Obesity or Overweight - High Blood Pressure - High Cholesterol -DM for CVD	- Low socioeconomic status - Mental ill health (depression) - Psychosocial stress - Heavy alcohol use - Use of certain medication - Lipoprotein(a)
Non-modifiable	**"Novel"**
- Age - Heredity or family history - Gender - Ethnicity or race	- Excess homocysteine in blood - Inflammatory markers (C-reactive protein) - Abnormal blood coagulation (elevated blood levels of fibrinogen)

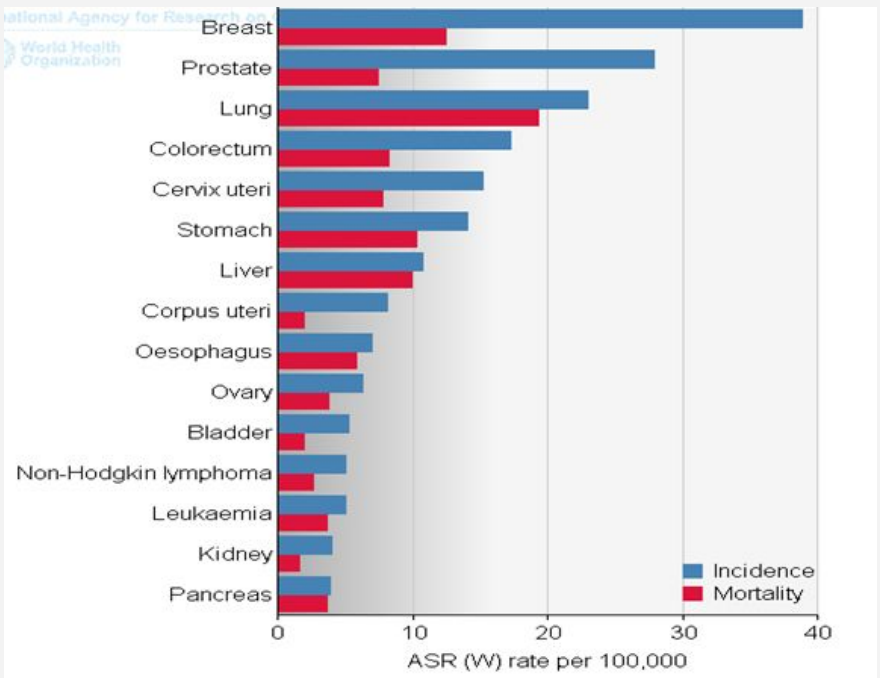
Cancer

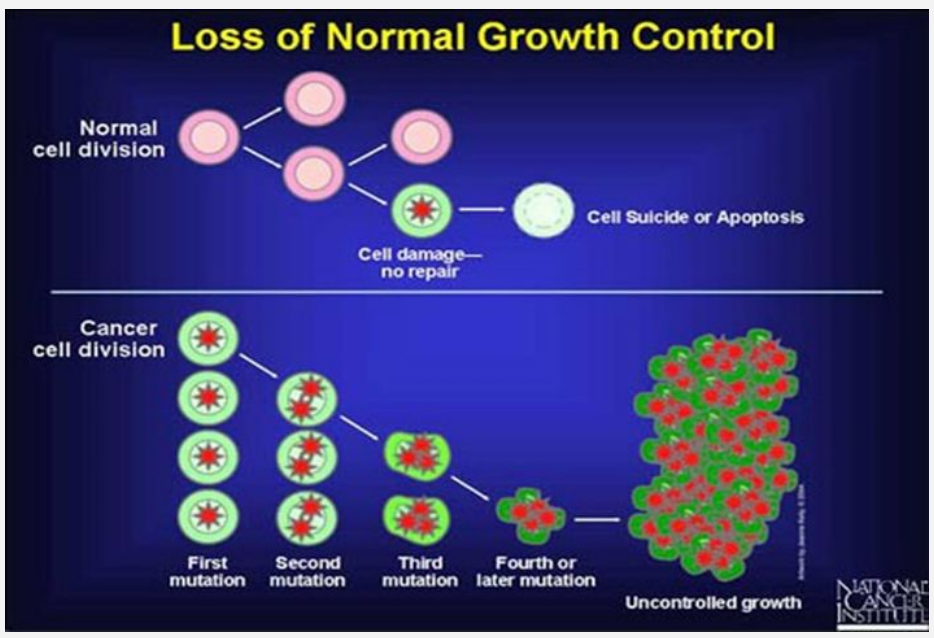
Definition

- Generic term for a large group of diseases that can affect any part of the body.
- "Rapid creation of abnormal cells that grow beyond their usual boundaries, and which can then invade adjoining parts of the body and spread to other organs." (WHO, 2012)



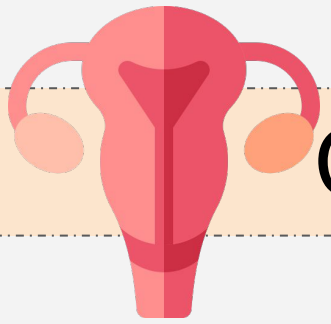
Estimated age-standardised incidence and mortality rates: total population





Global Burden

- 7.6 million people died from cancer in 2008.
- 70% of all cancer deaths occur in low- and middle- income countries.
- Deaths from cancer are estimated to reach 13.1 million by 2030.
- About 30% of cancers are attributable to behavior risk factors.



Cervical Cancer

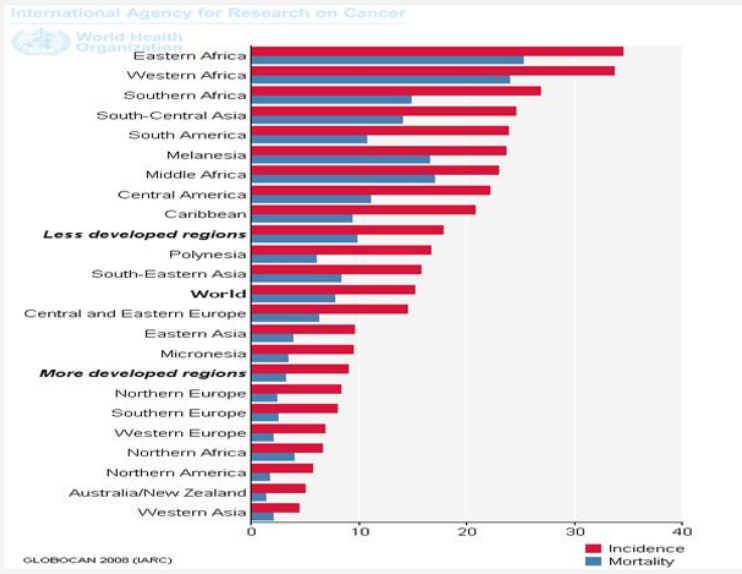
Definition cervical, liver, stomach cancers we have to pay attention because we can prevent them.

Cancer of the female reproductive system:

- Two cell types present (squamous and glandular)
- Tend to occur where the two cell types meet 99% of cases linked to genital infection with human papillomavirus (HPV)

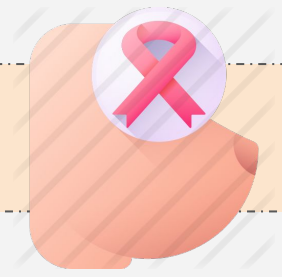
Risk Factors

- Human papilloma virus infection (HPV)
  It is preventable by vaccination.
- Smoking
- Immune Deficiencies Example:HIV
- Poverty Less access to health facilities
- No access to PAP screening
- Family history of cervical cancer



Estimated age-standardised rates (World)

Breast Cancer

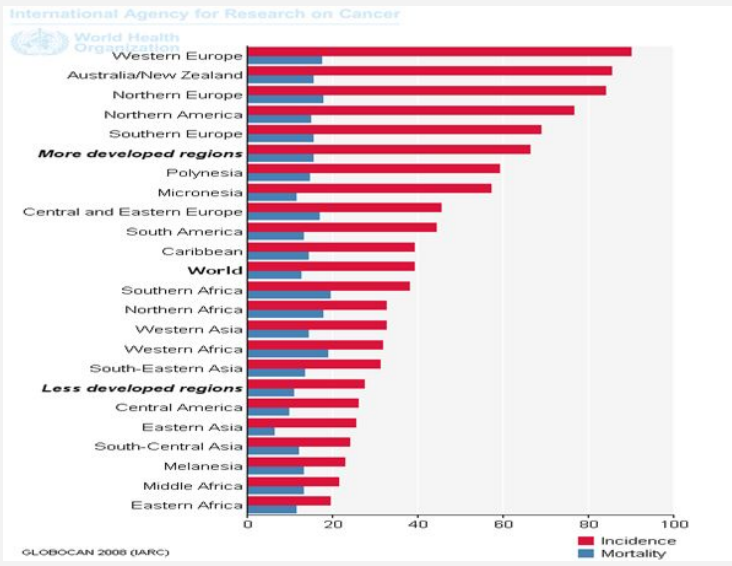


Definition

- Cancer that forms in the tissues of the breast, usually in the ducts or in the lobules
- Occurs commonly in women, rarely occurs in men
- 1 of 8 women will be diagnosed with breast cancer in her lifetime. It's the most common cancer,mortality is low in developed countries and high in developing countries..

Risk Factors

- Hormone therapies
- Weight and physical activity Obesity causes increased levels of estrogen because of the large fat tissue
- Race
- Genetics or family history
  a. BRCA1 and BRCA2 genes
- Age is the most reliable risk factor!
  Screening after 45 is important.
  a. Risk increases with age



Incidence and Mortality in 2008: Both Sexes

Lung Cancer

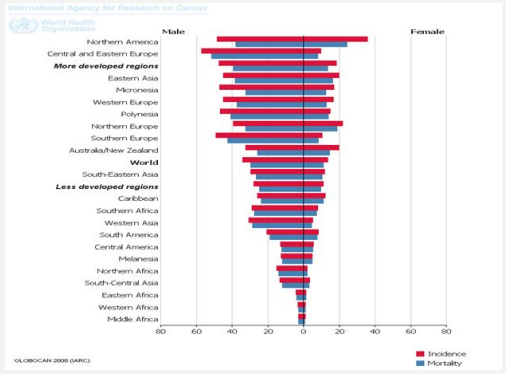
Definition

- Cancer that forms in tissues of the lung, usually in the cells lining air passages.
- Leading cause of cancer death globally,1.37 million deaths in 2008.
- Affects more men than women.
- Two main types:
  - Small cell lung cancer — More aggressive
  - Non-small cell lung cancer

It is Imp to differentiate between these 2 types because of the treatment; **SCC** can not be treated by **Surgery**.

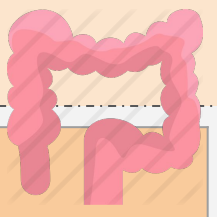
Risk Factors

- Smoking cigarettes, pipes, or cigars - now or in the past.
- Being exposed to secondhand smoke.
- Being treated with radiation therapy to the breast or chest.
- Being exposed to asbestos, radon, chromium, nickel, arsenic, soot, or tar.
- Living where there is air pollution.

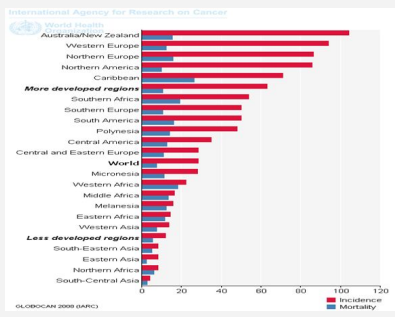


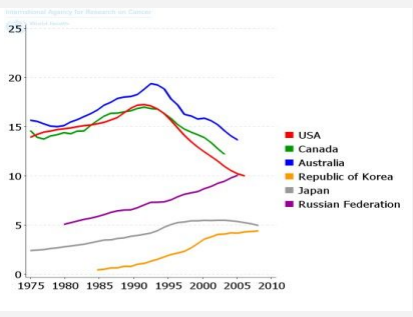
Incidence and Mortality in 2008: Both Sexes

Prostate & Colorectal Cancer

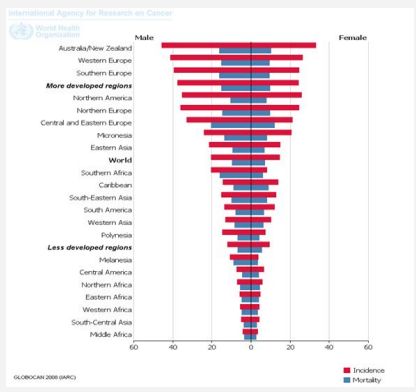


	Prostate Cancer	Colorectal Cancer
Definition	- **2nd most common cancer among men** - The cancer develops inside of the prostate gland.	- **3rd most common** type of cancer - Forms in the lower part of the digestive system (large intestine)
Risk Factors	- Age - Race - Obesity - Weight gain	- Aging - Black race - Unhealthy diet and low exercise - Diabetes - Family history of colorectal cancer





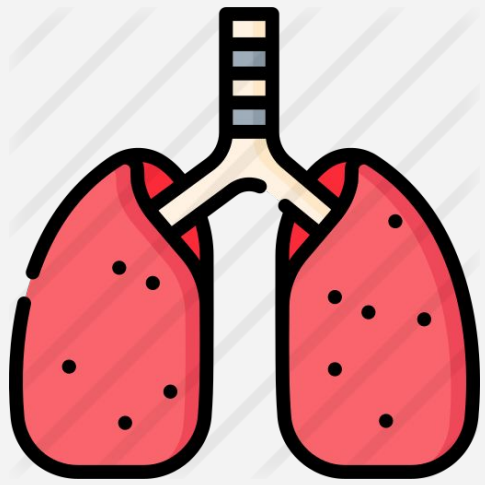
Incidence and Mortality in 2008: Total



Incidence and Mortality in 2008: Both Sexes

CHRONIC RESPIRATORY DISEASES

Global Burden



- A leading cause of death
- High under-diagnoses rates
- 90% of deaths occur in low-income countries

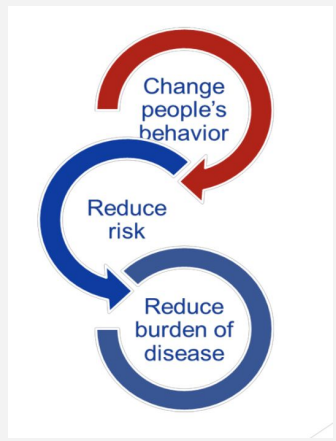
Shared Risk

- Genes
- Infections
- Socioeconomic status
- Aging populations

- Cigarette smoke
- Occupational dust and chemicals
- Environmental tobacco smoke (EST)
- Indoor and outdoor air pollution

Why Risk factors?

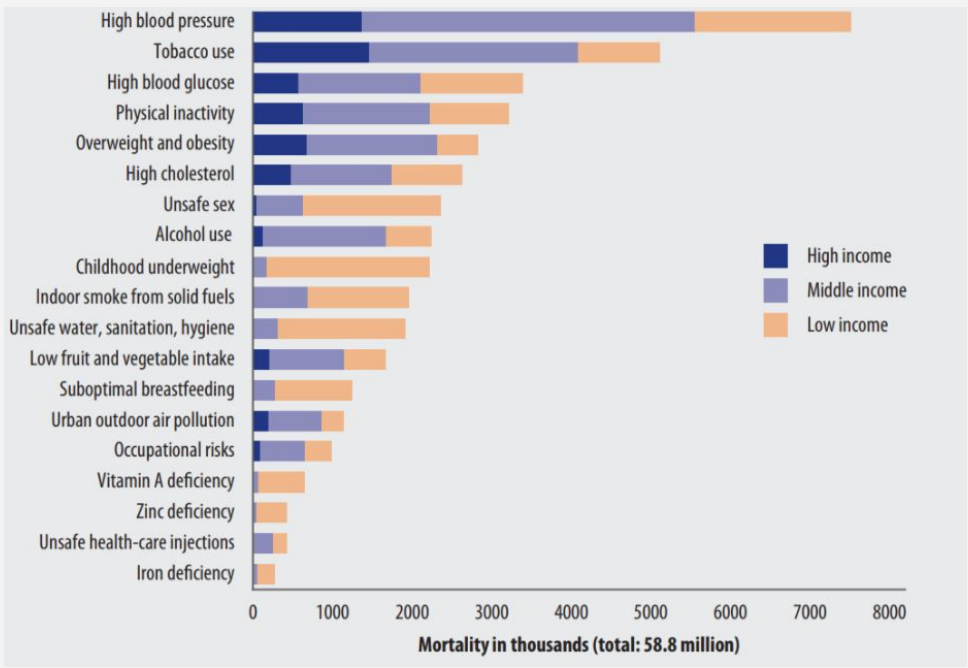
Surveillance for non-communicable disease can be difficult because of:



- Lag time between exposure and health condition
- More than one exposure for a health condition
- Exposure linked to more than one health condition

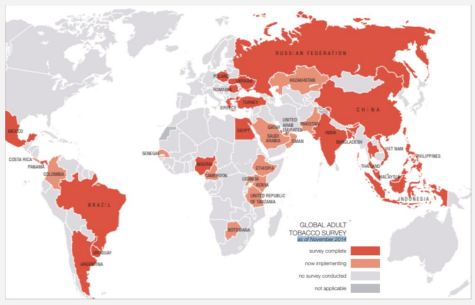
Interventions that target risk factors are needed to prevent disease.

Deaths attributed to 19 leading risk factors, by country income level, 2004



Tobacco Use

Tobacco use



- Tobacco kills up to half of its users.
- Tobacco kills nearly 6 million people each year.
- Annual death toll could rise to more than 8 million by 2030.
- Nearly 80% of the world's 1 billion smokers live in low- and middle-income countrie

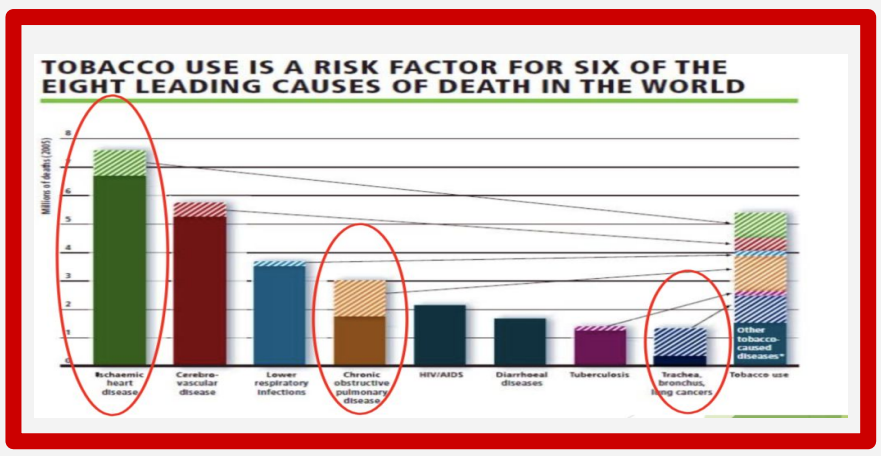
Tobacco use health effects

Among smokers:

- Cancer
- Coronary heart disease
- Diseases of the lungs
- Peripheral vascular disease
- Stroke
- Fetal complications and stillbirth

Second-hand smoke causes:

- Heart disease, including heart attack
- Lung cancer



Important

Unhealthy Diet

Global change in diet

Most countries have increased overall daily consumption of:

- Daily calories.
- Fat and meats.
- Energy dense and nutrient-poor foods such as:
  a. Starches
  b. Refined sugars
  c. Trans-fats

Cont’

Unhealthy diet: health effects

- Coronary heart disease
- Stroke
- Cancer
- Type 2 diabetes
- Hypertension
- Diseases of the liver and gallbladder
- Obesity

Physical Activity

Global changes in physical activity

31% of the world’s population does not get enough physical activity.

Many social and economic changes contribute to this trend:

- Aging populations,
- Transportation, and
- Communication technology.

6-10% of major NCDs worldwide is attributable to physical inactivity

6% coronary heart disease

7% type 2 diabetes

10% breast cancer

10% colon cancer

9% premature mortality

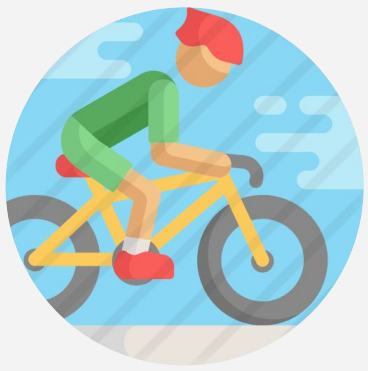
physical activity: health effects

Reduces:

- High blood pressure
- Adverse lipid profile
- Arthritis pain
- Psychiatric issues

Reduces risk of:

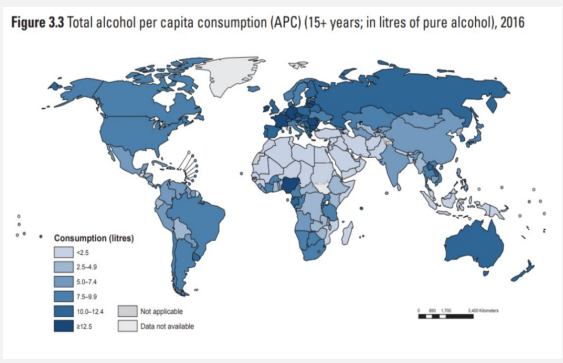
- Type 2 diabetes
- Certain cancers
- Heart attacks
- Stroke
- Falls
- Early death



Alcohol Use

Global alcohol consumption

- 11.5% of all global drinkers are episodic, heavy users.
- 2.5 million people die from alcohol consumption per year
- The majority of adults consume at low-risk levels.
- Estimated worldwide consumption of alcohol has remained relatively stable.



Use of alcohol

Excessive drinking, per day

- drinking – on average

- Binge drinking – single occasion

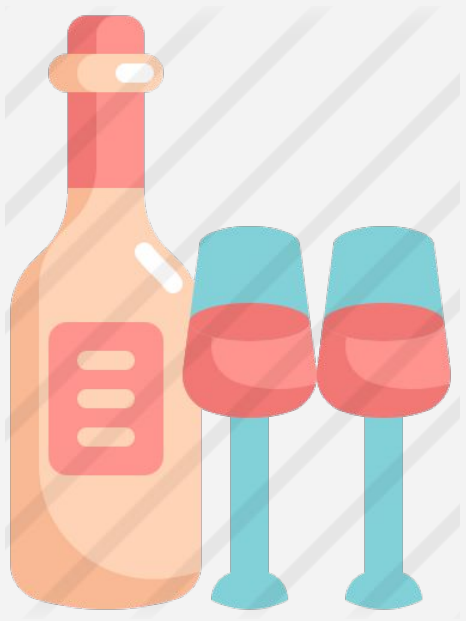
Alcohol use effects:

Immediate effects:

- Diminished brain function
- Loss of body heat
- Fetal damage
- Risk for unintentional injuries
- Risk for violence
- Coma and death

Long-term effects:

- Liver diseases
- Cancers
- Hypertension
- Gastrointestinal disorders
- Neurological issues
- Psychiatric issues



Metabolic risk factors

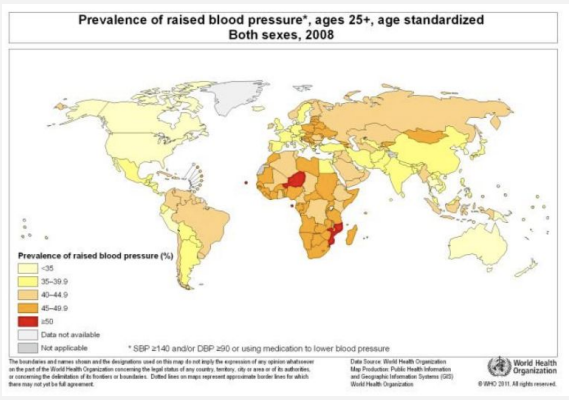
- Raised Blood Pressure (Hypertension)
- Raised Cholesterol
- Raised Blood Glucose
- Overweight and Obesity

Cont’

Raised blood pressure

- Hypertension
- (Systolic)/(Diastolic) in mm of Hg (mercury)
- Systolic = amount of force your arteries use when the heart pumps
- Diastolic = amount of force your arteries use when the heart relaxes

Measurement	Normal	Pre-Hypertensive	Hypertensive
Systolic mmHg	<120	120-139	140+
Diastolic mmHg	<80	80-89	90+



Raised blood pressure health effects

- Leading risk factor for stroke.
- Major risk factor for coronary heart disease.
- In some age groups, the risk of CVD doubles for each increment of 20/10 mmHg of blood pressure.
- Other complications of raised blood pressure:
    - Heart failure, Peripheral vascular disease, Renal impairment, Retinal hemorrhage, Visual impairment

Hypertension and excessive sodium intake

- Sodium, through hypertension, is a major cause of cardiovascular disease deaths and disability.
- About 10% of cardiovascular disease is caused by excess sodium intake.
- 8.5 million deaths could be prevented over 10 years if sodium intake were reduced by 15%.

Cont'

Sources of sodium

- People are unaware of how much dietary sodium they are eating.
- In the U.S. 75% of sodium consumed comes from processed and restaurant foods.
- In China and Japan, 75% of sodium consumed comes from cooking with high sodium products.

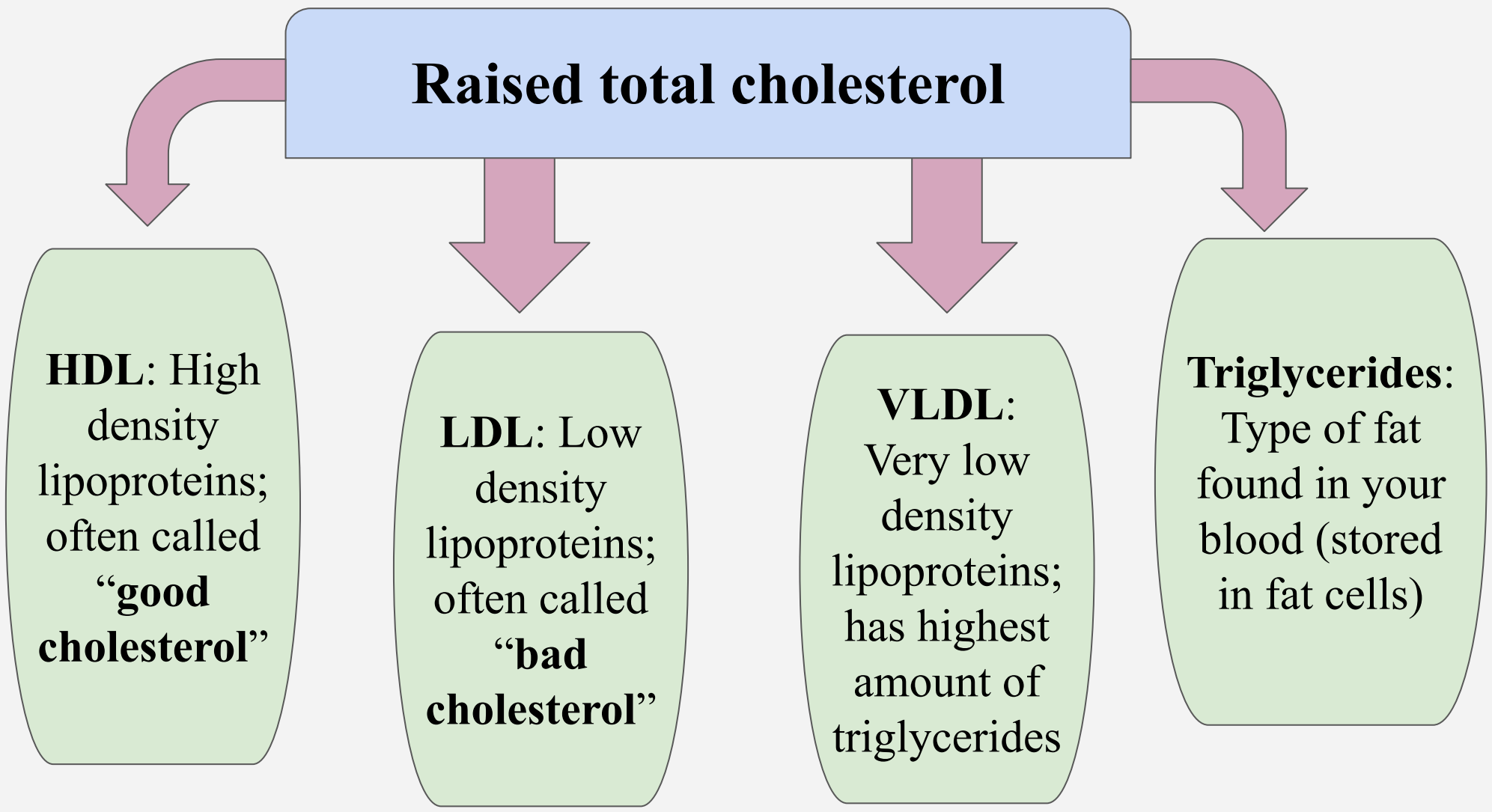
Recommendations and actual intakes WHO/PAHO

Recommendations

- A population salt intake of less than 5 grams or approximately 2,000 milligrams of sodium, per person per day is recommended to reach national targets or in their absence. This level was recommended for the prevention of cardiovascular diseases.

Actual Intake

- Latest global estimates show that average sodium intake varies from 2,000 to 7,200 milligrams of sodium per person per day.



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Raised total cholestrol Global Burden

- In 2008, global prevalence of raised total cholesterol among adults (≥ 5.0 mmol/l) was 39% (37% for males and 40% for females
- Estimated to cause 2.6 million deaths.

What is the prevalence of raised total cholesterol in your country?

- Search the WHO Global Health Observatory website: http://www.who.int/gho/ncd/risk_factors/en/index.html

Raised total cholesterol health effects

Increases risks of heart disease and stroke

- Globally,1/3ofischaemicheartdiseaseisattributableto high cholesterol
- A10% reduction in serum cholesterol in men aged 40 has been reported to result in a 50% reduction in heart disease within 5 years
- A10%reduction in serum cholesterol in men aged 70 years can result in an average 20% reduction in heart disease occurrence in the next 5 years

Cont’

Elevated glucose

- Sugar produces fuel and energy for our cells
- Insulin helps control the amount of glucose in our bodies

Global burden of elevated glucose

- In 2004, it was estimated that elevated glucose resulted in 3.4 million deaths (5.8% of all deaths).
- Globally, approximately 9% of adults aged 25 and over had elevated blood glucose in 2008.

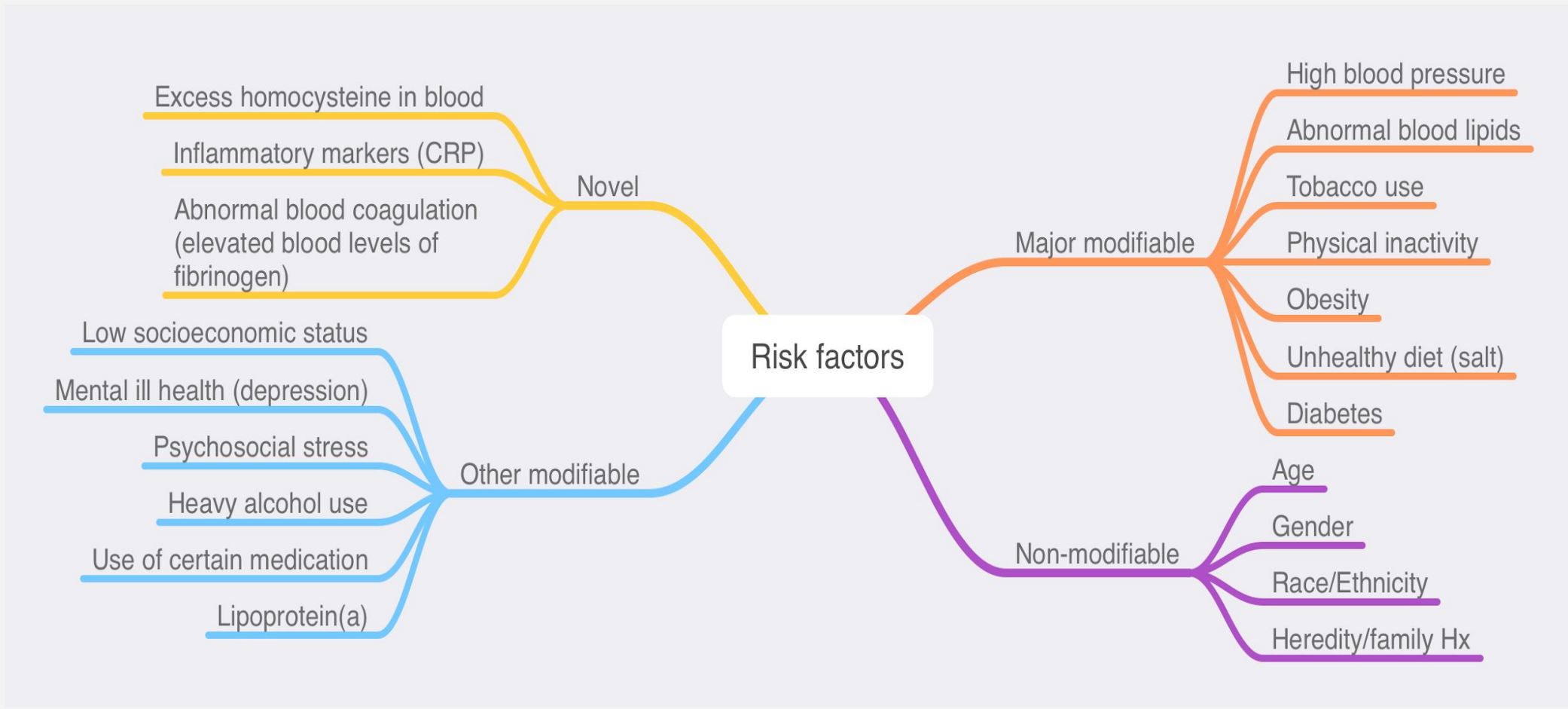
Elevated glucose health effects

1. Elevated glucose levels can lead to type 2 diabetes.
   a. Diabetes: leading cause of renal failure.
   b. Lower limb amputations are at least 10 times more common in people with diabetes than in non-diabetic people
2. Raised glucose is a major cause of heart disease and renal disease. It also damages the retina.

Overweight and obesity

- Overweight and obesity are defined as "abnormal or excessive fat accumulation that presents a risk to health.”
- BMI > the Body Mass Index
  - BMI = (weight in kg)/(height in meters, squared)
  - Between 25 and 29.9 indicates overweight
  - 30 or higher indicates obesity
- Skinfold Thickness Test
- Waist-to-Hip Circumference Ratio
  - Men > 102 cm are considered high risk
  - Women > 88 cm are considered high risk

Summary



Recall:

1. The 1st cause of death globally is cardiovascular diseases.
2. Prostate cancer is the 2nd most common cancer among males.
3. The 3rd most common cancer is colorectal cancer.
4. High blood pressure is the major factor of coronary heart disease.
5. A population salt intake of < 5 grams = 2,000 milligrams of Na/person/day.
6. Surveillance for NCDs can be difficult because of:
   - Lag time between exposure and health condition
   - More than one exposure for a health condition
   - Exposure linked to more than one health condition

MCQs

1- According to WHO the maximum recommended daily amount of sodium for healthy adults is about :
A- 1000mg
B- 2000mg
C- 3000mg
D- 4000mg

2- A 56 years old women comes to the clinic to discuss her risk of cancer. Which of the following cancers is among the leading causes of cancer death and will be a priority for you to screen ?
A- bladder cancer
B- colorectal cancer
C- ovary cancer
D- pancreatic cancer

3- why is the surveillance for NCDs difficult ?
A- High under diagnosed rates
B- interventions that target risk factors are needed
C- no information on exposures is available
D- the Lag time between exposure and health condition

4- which of the following is a risk factor for prostate cancer ?
A- alcohol use
B- high blood pressure
C- increased cholesterol
D- Race/ethnicity

5- which of the following is a risk factor for Cervical Cancer ?
A- access to PAP screening
B- Human papillomavirus infection (HPV)
C- Abnormal blood coagulation (elevated blood levels of fibrinogen)
D- Low consumption of fiber

6- Which one of the following is **not** a metabolic risk factor?
A- Raised sodium level
B- Raised blood glucose level
C- Raised cholesterol level
D- Obesity & overweight

7- Waist-to-Hip Circumference Ratio for women are considered high risk :
A- > 88 cm
B- < 88 cm
C- < 77 cm
D- > 77 cm

1- B
2- C
3- D
4- D
5- B
6- A
7- A