

# Introduction to Non-Communicable Diseases

## Objectives

- The epidemiology of non-communicable diseases
- Risk factors for non-communicable diseases
- Overall framework and common preventive strategies against non communicable diseases

## Color Index

- Main text
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- Females slides
- Doctor notes
- Important
- Textbook
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## Definition of NCDs

- Non-communicable diseases are all impairments or deviations from the normal, which have one or more of the following characteristics;

Are permanent

Caused by non-reversible pathological alterations<sup>1</sup>

Leave residual disability

Require special training of the patient for rehabilitation<sup>2</sup>

May be expected to require a long term supervision

## Epidemiology of NCDs

- 1 Noncommunicable diseases (NCDs) kill 41 million people each year, equivalent to 71% of all deaths globally.
- 2 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.
- 3 Cardiovascular diseases account for most NCD deaths, or 17.9 million people annually, followed by cancers (9million), respiratory diseases (3.9million), and diabetes (1.6million).
- 4 These 4 groups of diseases account for over 80% of all premature NCD deaths.
- 5 Tobacco use<sup>3</sup>, physical inactivity, the harmful use of alcohol and unhealthy diets all increase the risk of dying from a NCD. If you can control these 4, you control the NCDs.
- 6 Detection, screening and treatment of NCDs, as well as palliative care, are key components of the response to NCDs.

## Risks are increasing



chronic diseases are concentrated among the poor<sup>4</sup>



80% of premature heart disease, stroke and type 2 diabetes is preventable, 40% of cancer is preventable



inexpensive and cost-effective interventions exist



chronic diseases affect men and women almost equally



almost half in people under age 70 years<sup>5</sup>

misunderstanding

chronic diseases mainly affect rich people

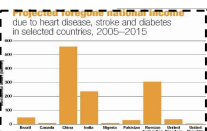
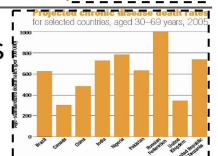
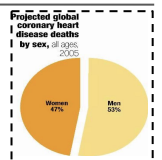
chronic diseases can't be prevented

chronic diseases prevention and control is too expensive

Reality

chronic diseases affect primarily men

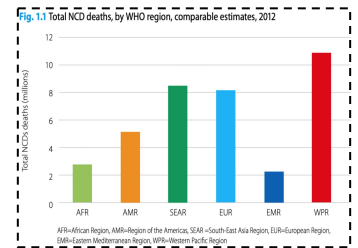
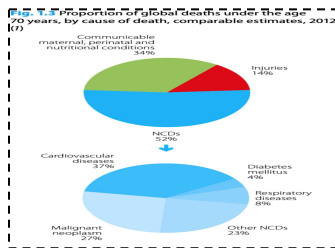
chronic diseases mainly affect Old people



The economic impact: billions

1: For ex: cancer  
 2: Most patients enter the 3rd phase of rehabilitation.  
 3: It plays a major risk factor for all NCDs.  
 4: Due to the lack of health facilities and education which leads to late diagnosis.  
 5: For ex: DM type 1 affects children and young people.

80% of chronic disease deaths occur in low & middle income countries<sup>1</sup>



## Non-Communicable Diseases<sup>2</sup>

- 1 Hypertensive Heart Diseases
- 2 Chronic Obstructive diseases
- 3 Coronary Heart Diseases
- 4 Mental Retardation
- 5 Mental disorders: Schizophrenia, anxiety and depression
- 6 Peptic Ulcer
- 7 Blindness
- 8 Diabetes
- 9 Arthritis
- 10 Cancer
- 11 Stroke

### Causes of non-communicable diseases

- 1 | Underlying socioeconomic, cultural, political and environmental determinants:
  - Globalization<sup>3</sup> • Urbanization<sup>4</sup> • Population ageing
- 2 | Common modifiable risk factors:
  - Unhealthy diet • Physical inactivity • Tobacco use
- 3 | Non-modifiable risk factors:
  - Age • Heredity • Gender
- 4 | Intermediate risk factors:
  - Raised blood pressure • Raised blood glucose • Abnormal blood lipids • Overweight/obesity
- 5 | Main Chronic Diseases:
  - Heart Disease • Stroke • Cancer • Chronic Respiratory Disease • Diabetes

#### Modifiable behavioral risk factors

Modifiable behaviours, such as tobacco use, physical inactivity, unhealthy diet and the harmful use of alcohol, all increase the risk of NCDs.

- Tobacco accounts for over 7.2 million deaths every year (including from the effects of exposure to second-hand smoke).
- 4.1 million annual deaths have been attributed to excess salt/sodium intake<sup>5</sup>.
- More than half of the 3.3 million annual deaths attributable to alcohol use are from NCDs, including cancer.
- 1.6 million deaths annually can be attributed to insufficient physical activity.

#### Metabolic risk factors

Metabolic risk factors contribute to four key metabolic changes that increase the risk of NCDs:

- Raised blood pressure
  - Overweight/obesity
  - Hyperglycaemia (high blood glucose levels)
  - Hyperlipidaemia (high levels of fat in the blood)
- In terms of attributable deaths:
1. Elevated blood pressure (Attributable risk is 19%)
  2. Overweight and obesity
  3. Raised blood glucose.

1: Every region contributes to these deaths including high income countries like KSA due to increased risk in the past years. ( check the right diagram )

2: NCDs are attributable for almost 52% of deaths among those who are younger than 70 y/o and 37% of these NCDs are due to cardiovascular diseases ( check the left diagram )

3: Due to the elimination of borders and boundaries between countries (migration, sharing cultures and diet).

4: Living in cities, where there are less outdoor and physical activities.

5: Leads to HTN which in return leads to coronary disease and stroke.

## Modifiable risk factors

VS

## Non Modifiable risk factors

- Cigarette smoking 🚬
- High Blood pressure 🩺
- Elevated serum Cholesterol 📊
- Diabetes 🩺
- Lifestyle changes (dietary patterns, physical activity) 🏃
- Stress factors 🧠
- Alcohol abuse 🍷

- Age 🧓
- Sex 🧑
- Family Hx 🏠
- Genetic factors 🧬
- Personality 🧠
- Race 🌍

### The objectives of Integrated Chronic Disease Prevention and Control Programme are:

- 1 To strengthen prevention and control of chronic non-communicable diseases by tackling the major risk factors, focusing on WHO's four priority non-communicable diseases - cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases, and underlying determinants of health.
- 2 To reduce premature mortality and morbidity.
- 3 To improve quality of life, with particular focus on developing countries.



### Framework for NCD prevention

#### Primary prevention

- Population Strategy<sup>1</sup>
- High Risk strategy<sup>1</sup>



#### Secondary prevention<sup>2</sup>

#### Tertiary prevention<sup>3</sup>

#### Population Strategy<sup>4</sup>

- Dietary Changes
- Blood pressure control
- Physical activity (weight reduction)- specially children
- Behavioral change reduction of stress & Smoking cessation
- Self care
- Health education

#### High risk approach<sup>5</sup>

- Identify Risk: Identify high risk people and families eg those who smoke, and have high serum cholesterol.
- Specific Advice: helping them to stop smoking and exercise and diet control ect

#### Secondary approach

- Continuation of primary care.  
Early case detection and treatment.
- Eg: CHD
    - Cessation of smoking
    - Reduction of serum cholesterol level
    - Compliance

1: The difference between them is to distinguish which disease needs a broader strategy.

2: For ex: drug compliance.

3: Rehabilitation.

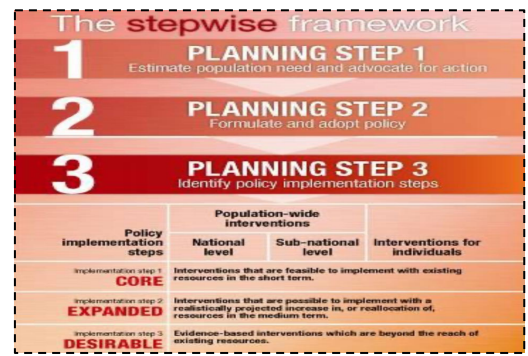
4: Towards prevalent diseases in the community such as DM, stroke, breast / colon cancer and tobacco smokers (due to its wide spread).

5: Towards specific groups (high risk groups) like alcoholics, tobacco smokers (if you want to make your efforts very concentrated).

# What works?

Comprehensive and integrated action is the means to prevent and control chronic diseases.

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## Global Actions



### Box 1.1 Voluntary global targets for prevention and control of noncommunicable diseases to be attained by 2025

- (1) A 25% relative reduction in the overall mortality from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases
- (2) At least 10% relative reduction in the harmful use of alcohol, as appropriate, within the national context
- (3) A 10% relative reduction in prevalence of insufficient physical activity
- (4) A 30% relative reduction in mean population intake of salt/sodium
- (5) A 30% relative reduction in prevalence of current tobacco use
- (6) A 25% relative reduction in the prevalence of raised blood pressure or contain the prevalence of raised blood pressure, according to national circumstances
- (7) Halt the rise in diabetes and obesity
- (8) At least 50% of eligible people receive drug therapy and counselling (including glycaemic control) to prevent heart attacks and strokes
- (9) An 80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major noncommunicable diseases in both public and private facilities

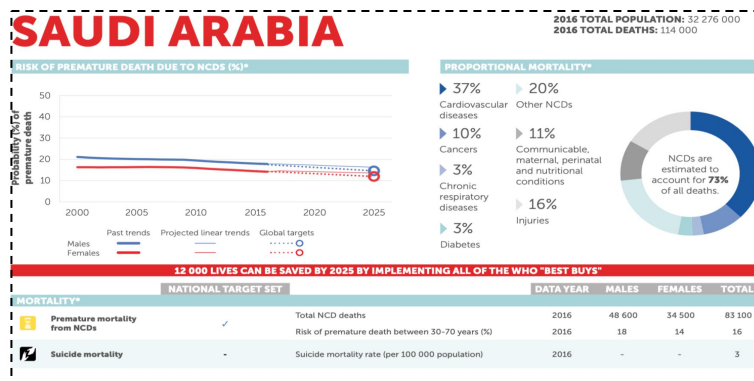
### Box 1.3 Key messages of the Global Status Report on Noncommunicable diseases 2014

- Message 1** Noncommunicable diseases act as key barriers to poverty alleviation and sustainable development.
- Message 2** While some countries are making progress, the majority are off course to meet the global NCD targets.
- Message 3** Countries can move from political commitment to action by prioritizing high-impact, affordable interventions.
- Message 4** All countries need to set national NCD targets and be accountable for attaining them.
- Message 5** Structures and processes for multisectoral and intersectoral collaboration need to be established.
- Message 6** Investment in health systems is critical for improving NCD outcomes.
- Message 7** Institutional and human resource capacities and financial resources for NCD prevention and control require strengthening.

### Box 1.2 Objectives of the Global NCD Action Plan (7)

1. To raise the priority accorded to the prevention and control of NCDs in global, regional and national agendas and internationally agreed development goals, through strengthened international cooperation and advocacy.
2. To strengthen national capacity, leadership, governance, multisectoral action and partnerships to accelerate country response for the prevention and control of NCDs.
3. To reduce modifiable risk factors for NCDs and underlying social determinants through creation of health-promoting environments.
4. To strengthen and orient health systems to address the prevention and control of NCDs and the underlying social determinants through people-centred primary health care and universal health coverage.
5. To promote and support national capacity for high-quality research and development for the prevention and control of NCDs.
6. To monitor the trends and determinants of NCDs and evaluate progress in their prevention and control.

## Situation in Saudi Arabia



### NATIONAL SYSTEMS RESPONSE

☑ Drug therapy to prevent heart attacks and strokes	Proportion of population at high risk for CVD or with existing CVD (%)	-	...
	Proportion of high risk persons receiving any drug therapy and counselling to prevent heart attacks and strokes (%)	-	...
	Proportion of primary health care centres reported as offering CVD risk stratification	2017	More than 50%
☑ Essential NCD medicines and basic technologies to treat major NCDs	Reported having CVD guidelines that are utilized in at least 50% of health facilities	2017	Yes
	Number of essential NCD medicines reported as "generally available"	2017	10 out of 10
	Number of essential NCD technologies reported as "generally available"	2017	6 out of 6

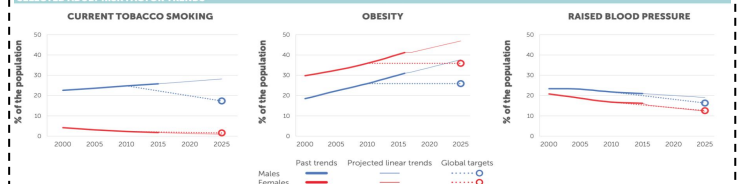
.. = no data available  
\* The mortality estimates for this country have a high degree of uncertainty because they are not based on any national NCD mortality data (see Explanatory Notes)

World Health Organization - Noncommunicable Diseases (NCD) Country Profiles, 2018.

### RISK FACTORS

☑ Harmful use of alcohol	X	Total alcohol per capita consumption, adults aged 15+ (litres of pure alcohol)	2016	0	0	0
☑ Physical inactivity	✓	Physical inactivity, adults aged 18+ (%)	2016	44	64	52
☑ Salt/Sodium intake	X	Mean population salt intake, adults aged 20+ (g/day)	2010	8	8	8
☑ Tobacco use	✓	Current tobacco smoking, adults aged 15+ (%)	2016	26	2	16
☑ Raised blood pressure	✓	Raised blood pressure, adults aged 18+ (%)	2015	21	16	19
☑ Diabetes	X	Raised blood glucose, adults aged 18+ (%)	2014	15	14	14
☑ Obesity	✓	Obesity, adults aged 18+ (%)	2016	31	41	35
☑ Ambient air pollution	-	Obesity, adolescents aged 10-19 (%)	2016	19	14	17
	-	Exceedance of WHO guidelines level for annual PM2.5 concentration (proportion)	2016	-	-	8
☑ Household air pollution	-	Population with primary reliance on polluting fuels and technologies (%)	2016	-	-	<5

### SELECTED ADULT RISK FACTOR TRENDS



1: Step 1 → Data, data will give us how many male and female diabetics we have, how many people died of stroke and how many people need secondary or tertiary prevention due to stroke.

Step 2 → Policy, for ex. adaptation of tobacco free areas and taxation of tobacco products.

Step 3 → Implementation:

A. National level: not selling tobacco products to anyone under 18.

B. Sub-national level: labeling zones and neighborhoods that are smoke free.

C. Individuals level: fines/penalties for anyone who smokes in a smoke free area.

# Quiz

## MCQ

1-All of the followings are features of non-communicable diseases EXCEPT:

- A- Permanent
- B- Causes disability
- C- Reversible causes
- D- Non-reversible causes

2-Most of the chronic diseases are preventable:

- A-True
- B-False

3-Lack of physical activity and unhealthy diet both on long term can lead to all of the following except:

- A- Hypotension
- B-Hyperglycemia
- C- Elevated HDL
- D- A and C

4-WHO four priority NCDs are:

- A- Diabetes, Cardiovascular, cancer and chronic respiratory diseases
- B-Hypertension, Diabetes, cancer and chronic respiratory diseases
- C-Hyperlipidemia, diabetes, cardiovascular and hypertension
- D-Any chronic disease causes disability and needs prolonged treatment is a priority

## Answers

Q1	Q2	Q3	Q4
C	A	D	A





Thank You and  
Good Luck



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