Overview of Non-Communicable Disease

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

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Important | Extra | Notes

Editing file

Definition:

- No definitive treatment
- Long time to show up
- Can't be transmitted

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

- Are permanent
- Leave residual disability
- Caused by non-reversible pathological alterations
- Require special training of the patient for rehabilitation
- May be expected to require a long term supervision

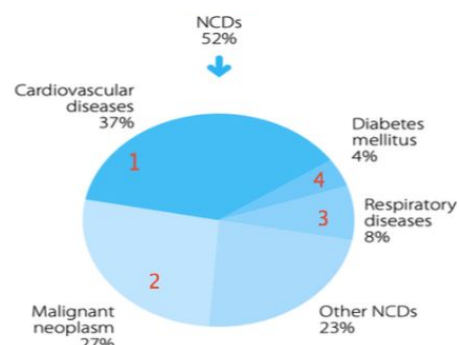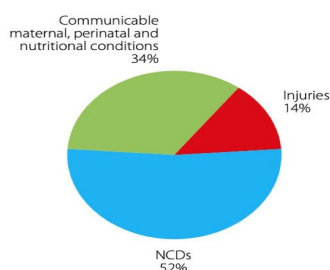**Difference between CD and NCD:** Latency period in NCD, Incubation period in CD

Why do you want to know the latency period? To know at which level can we intervene

Are chronic diseases and NCD the same? NCDs are not necessarily chronic, arthritis (all the criteria above apply) for example and it can be a sequel of septic arthritis which is an acute infection that can lead to non-communicable irreversible disability and it's permanent, caused by irreversible pathological alteration

Epidemiology of NCDs:

- Noncommunicable diseases (NCDs) kill 41 million people each year, equivalent to 71% of all deaths globally.
- This means that more than half of the deaths globally are due to NCDs
- 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.
- This means that it can be prevented by early and easy intervention
- 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
- Treatment is vital, if you don't treat you end up with palliative care
- What's our concerns about palliative care? Cost and quality of life

Fig. 1.3 Proportion of global deaths under the age 70 years, by cause of death, comparable estimates, 2012 *(1)*

Communicable maternal, perinatal and nutritional conditions 34%

Injuries 14%

NCDs 52%

NCDs 52%

Cardiovascular diseases 37%

Diabetes mellitus 4%

Respiratory diseases 8%

Other NCDs 23%

Malignant neoplasm 27%

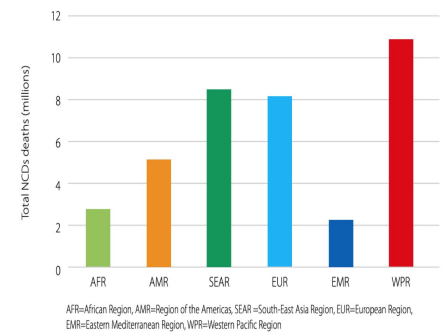# 80% of chronic disease deaths occur in low & middle income countries?

Initially we said that the developed countries have the biggest burden of these diseases.

However, because of demographic figures, globalization and so many things, the train has been shifted and now the major burden of these deaths are in the middle and low income countries.

Why? Because they can't afford care, population has increased disproportionately, lifestyle has been modified.
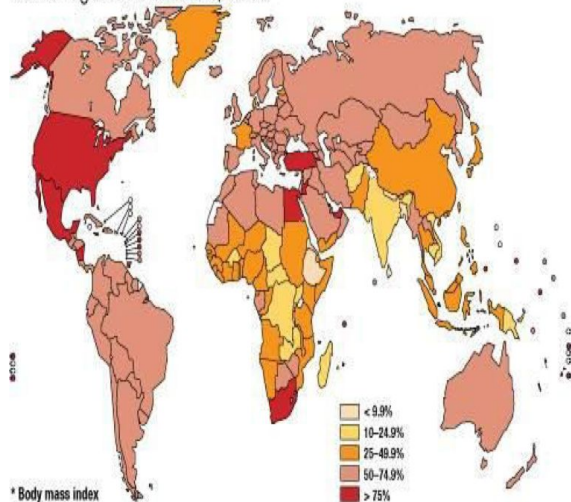
Yes, the lifestyle issues were made by the west, but quickly they identified the risk associated with it and made policies and regulations to cut the risk factors. But the east adapted the western lifestyle which caused an epidemic.

Fig. 1.1 Total NCD deaths, by WHO region, comparable estimates, 2012
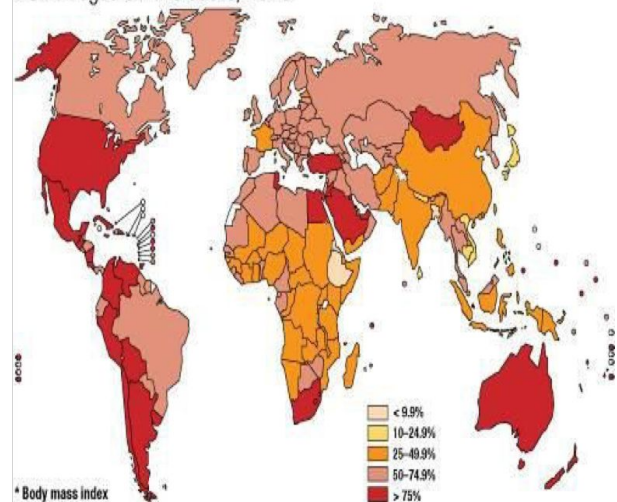
AFR=African Region, AMR=Region of the Americas, SEAR =South-East Asia Region, EUR=European Region, EMR=Eastern Mediterranean Region, WPR=Western Pacific Region

Risks are increasing

Projected prevalence of overweight (BMI* ≥25 kg/m²), women aged 30 and above, 2005

< 9.9%
10–24.9%
25–49.9%
50–74.9%
> 75%
* Body mass index

Projected prevalence of overweight (BMI* ≥25 kg/m²), women aged 30 and above, 2015

< 9.9%
10–24.9%
25–49.9%
50–74.9%
> 75%
* Body mass index

It was predicted in 2005 that if you don't put in the interventions design and elaborated on there will be a disproportionate growth of all these incidencies especially overweight.

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Realities:

- ## Chronic diseases are concentrated among the poor

  - One of the main reasons is that you don't have access to health care, even if they know that they have HTN, DM, or they're obese.

  - In fact, the poor are only a little bit more affected. They are almost equal (rich and poor)

- ## Almost half in people under age 70 years

  - Because cancer epidemiology is now toward the younger age groups. (Ex. cervical, uterine, breast)

  - This is why we teach girls at school how to perform breast self-examination.

  - Even CVD and MI has started affecting people in their 30's.

Projected chronic disease death rates for selected countries, aged 30–69 years, 2005
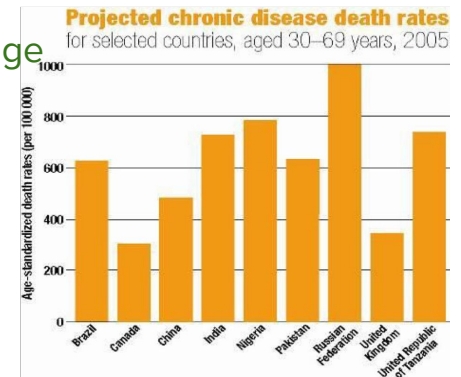
- ## Chronic diseases affect men and women almost equally

  - Because of early menopause and hormonal therapy, they are equally prone to developing MIs and CVDs to men.

Projected global coronary heart disease deaths by sex, all ages, 2005
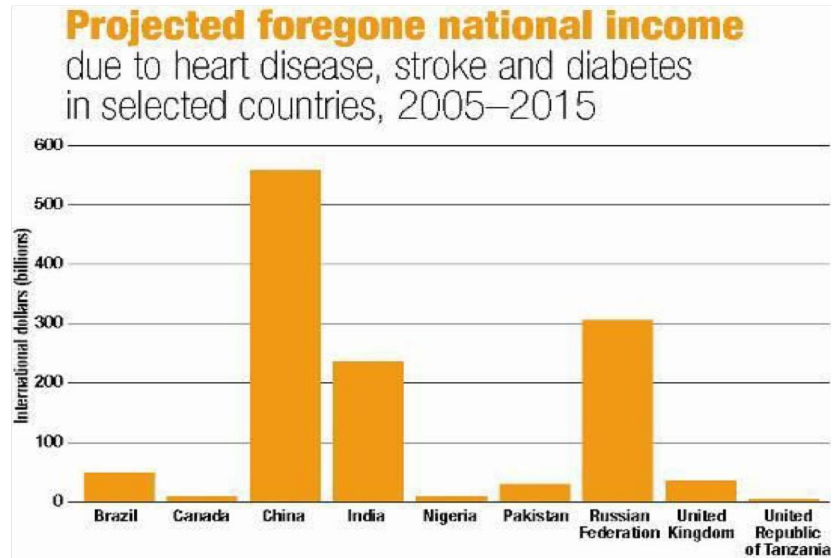
Women 47% Men 53%
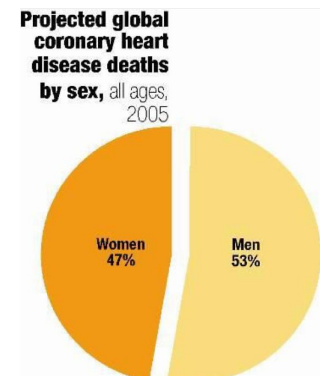
- ## 80% of premature heart disease, stroke and type 2 diabetes is preventable, 40% of cancer is preventable

- ## Inexpensive and cost-effective interventions exist

  - Treatment is most expensive

  - Prevention costs less on the long run, you will not be able to see the effect by tomorrow, so it's considered expensive momentarily.
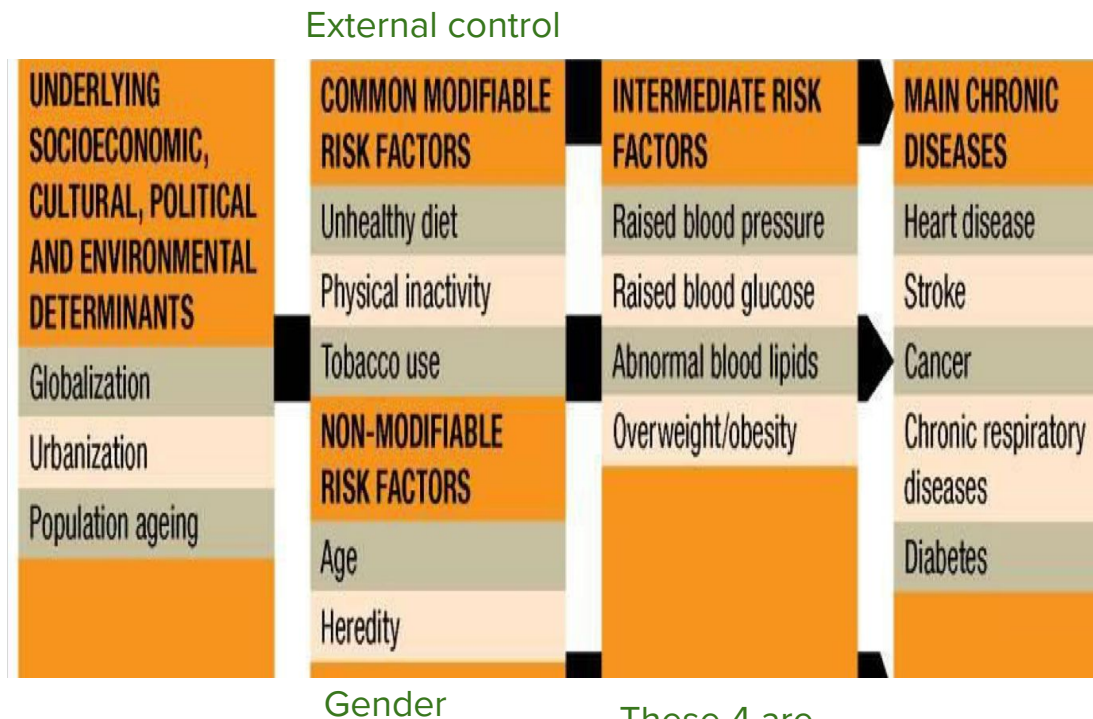
The economic impact: Billions

It shows that China, India and Russia, pay a lot of money just to tackle these 3 diseases.

Projected foregone national income
due to heart disease, stroke and diabetes
in selected countries, 2005–2015

International dollars (billions)

Brazil | Canada | China | India | Nigeria | Pakistan | Russian Federation | United Kingdom | United Republic of Tanzania

Examples:

- Coronary Heart diseases

- Cancer

- Peptic Ulcer

- Schizophrenia

- Hypertensive Heart diseases

- Stroke

- Blindness

- Arthritis

- Chronic Obstructive diseases

- Diabetes

- Mental Retardation

- Anxiety and depression

Causes of Non-communicable diseases:

External control

UNDERLYING SOCIOECONOMIC, CULTURAL, POLITICAL AND ENVIRONMENTAL DETERMINANTS	COMMON MODIFIABLE RISK FACTORS	INTERMEDIATE RISK FACTORS	MAIN CHRONIC DISEASES
Globalization	Unhealthy diet	Raised blood pressure	Heart disease
Urbanization	Physical inactivity	Raised blood glucose	Stroke
Population ageing	Tobacco use	Abnormal blood lipids	Cancer
	NON-MODIFIABLE RISK FACTORS	Overweight/obesity	Chronic respiratory diseases
	Age		Diabetes
	Heredity		

Gender

These 4 are categorized as the immediate risk factors for NCDs

Why are NCDs more common in low/middle income countries? Globalization and urbanization.

Stationary population (population of young) needs to focus more to decreasing or eliminate the risk factors so that after 30-40 years these diseases do not occur (decreased prevalence)

What are the causes of why people are eating unhealthily, not exercising and smoking? Because of globalization, urbanization and the demographic transitions.

Simple walking exercise or diet would drastically decrease all the intermediate risk factors.

What do we mean by interrelation / interconnection of risk factors? Controlling one risk factor leads to preventing multiple diseases (beneficial) On the other hand, a person having high blood pressure will not be only at risk of stroke, he will be at risk of dying of heart disease or heart attack. So one risk factor can lead to a number of diseases (disastrous).

Modifiable behavioural risk factors:

- 0.5 mg reduction of salt = 5 mmHg in BP
- As simple as "Do not sprinkle salt on your food"

- 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
- More than half of the 3.3 million annual deaths attributable to alcohol use are from NCDs, including cancer
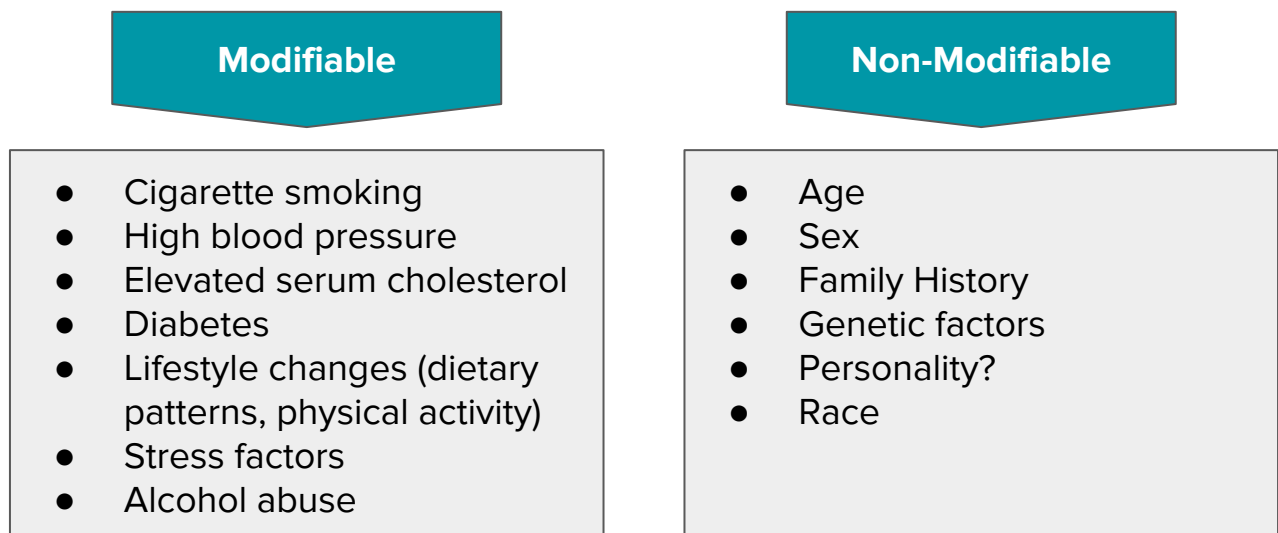- 1.6 million deaths annually can be attributed to insufficient physical activity

Metabolic risk factor:

- 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) and
- 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.

So if you control BP you decrease incidence rate by 19% (huge number)

Risk factors:
The most common risk factor for NCD in primary school children in ksa is nutritional imbalance

Modifiable	Non-Modifiable
- Cigarette smoking - High blood pressure - Elevated serum cholesterol - Diabetes - Lifestyle changes (dietary patterns, physical activity) - Stress factors - Alcohol abuse	- Age - Sex - Family History - Genetic factors - Personality? - Race

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

- 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
- To reduce premature mortality and morbidity
- To improve quality of life, with particular focus on developing countries

Framework for NCD prevention

Prevention:

- Primary prevention:
  - Population strategy
  - High risk strategy

- Secondary Prevention
- Tertiary prevention

Tertiary: Make their life easier
Ex. Amputated leg, cancer patients
Do you tell terminally ill cancer patients, bye you're gonna die? NO, you make the end of their lives bearable, compatible and livable .

Population strategy: Ex. using social media

- Dietary changes
- Blood pressure control
- Self care
- Health Education

- Physical activity (weight reduction) - especially children
- Behavioral change - reduction of stress and smoking cessation

High Risk approach:

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

Target:
- People who are actually obese.
- Personal cancer Hx
- People who have family Hx of: Early death due to MI, Cancer

Secondary Prevention:

- Continuation of primary care
- Early case detection and treatment
  - E.g. CHD
    - Cessation of smoking
    - Reduction of serum cholesterol level
    - Mammogram in high risk female
- Compliance

What interventions can be applied in a DM patient? Slow the progression of DM by: Decreasing the use of sugar, Modify lifestyle, Drug compliance (most important)

Compliance to medication is the best example of secondary intervention in DM, MI, CVD patients.
50% of them actually know that they have the disease and 50% of the previous know that they're supposed to take drugs 50% of the previous are on a controlled drug regime.

What works:

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

Global Actions

Box I.2 Objectives of the Global NCD Action Plan (*1*)

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.

Box I.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

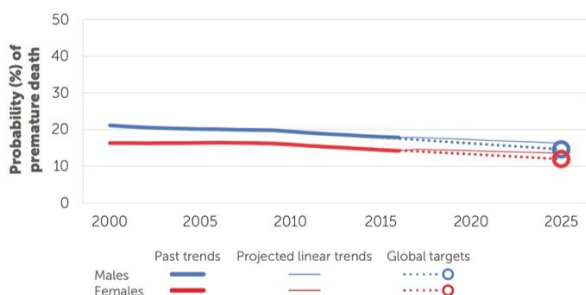**Message 6** Investment in health systems is critical for improving NCD outcomes

Message 7 Institutional and human resource capacities and financial resources for NCD prevention and control require strengthening.
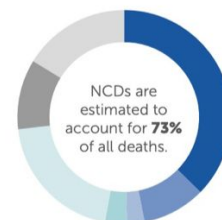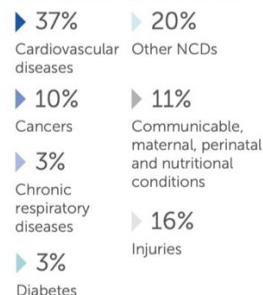
Situation in Saudi Arabia

SAUDI ARABIA

2016 TOTAL POPULATION: 32 276 000
2016 TOTAL DEATHS: 114 000

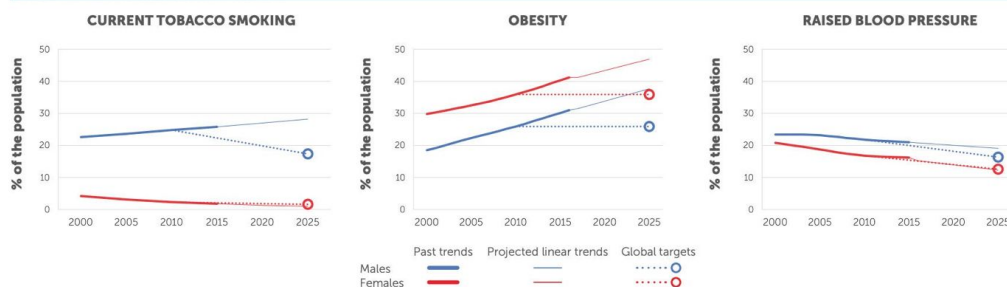### RISK OF PREMATURE DEATH DUE TO NCDS (%)*

Probability (%) of premature death (y-axis, 0–50), years 2000–2025 (x-axis)

Past trends | Projected linear trends | Global targets
Males
Females

PROPORTIONAL MORTALITY*

▶ 37% Cardiovascular diseases
▶ 20% Other NCDs
▶ 10% Cancers
▶ 11% Communicable, maternal, perinatal and nutritional conditions
▶ 3% Chronic respiratory diseases
▶ 16% Injuries
▶ 3% Diabetes

NCDs are estimated to account for **73%** of all deaths.

12 000 LIVES CAN BE SAVED BY 2025 BY IMPLEMENTING ALL OF THE WHO "BEST BUYS"

MORTALITY*	NATIONAL TARGET SET		DATA YEAR	MALES	FEMALES	TOTAL
Premature mortality from NCDs	✓	Total NCD deaths	2016	48 600	34 500	83 100
		Risk of premature death between 30-70 years (%)	2016	18	14	16
Suicide mortality	-	Suicide mortality rate (per 100 000 population)	2016	-	-	3

RISK FACTORS			DATA YEAR	MALES	FEMALES	TOTAL
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
		Obesity, adolescents aged 10-19 (%)	2016	19	14	17
Ambient air pollution	-	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

CURRENT TOBACCO SMOKING | OBESITY | RAISED BLOOD PRESSURE (% of the population, 2000–2025)

Past trends | Projected linear trends | Global targets
Males
Females

NATIONAL SYSTEMS RESPONSE

Drug therapy to prevent heart attacks and strokes	X	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%
		Reported having CVD guidelines that are utilized in at least 50% of health facilities	2017	Yes
Essential NCD medicines and basic technologies to treat major NCDs	X	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.

We only have targets for physical activity, tobacco, BP and obesity

Social media intervention helped, but if you want to reach the targets you still have to reach out and increase your efforts.

Summary

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

1. Are permanent
2. Leave residual disability
3. Caused by non-reversible pathological alterations
4. Require special training of the patient for rehabilitation
5. May be expected to require a long term supervision

Epidemiology of NCDs:

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- Tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets all increase the risk of dying from a NCD.

Examples of NCDs: Coronary Heart Diseases • Hypertensive Heart Diseases • Cancer • Stroke • Diabetes • Chronic Obstructive diseases • Peptic Ulcer • Blindness • Mental Retardation • Schizophrenia • Arthritis

Summary

Metabolic risk factor for NCDs :

- Raised blood pressure(Attributable risk is 19%)
- Overweight/obesity
- Hyperglycaemia
- Hyperlipidaemia

The most common risk factor for NCD in primary school children in ksa is nutritional imbalance

Prevention:

Primary Population strategy	Primary High Risk approach	Secondry prevention
➔ Dietary Changes ➔ Blood pressure control ➔ Physical activity (weight reduction) - specially children ➔ Behavioral change – reduction of stress and Smoking cessation. ➔ Self care ➔ Health education	➔ Identify Risk: Identify high risk people and families e.g. those who smoke, and have high serum cholesterol ➔ Specific Advice: helping them to stop smoking and exercise and diet control etc.	➔ Cessation of smoking ➔ Reduction of serum cholesterol level ➔ Mammogram in high risk female

Good luck!