Introduction to Public Health Module # 15

Heart disease and it's prevention.
DR. SHAIKH ABDUS SALAM

Dept. of Public Health
North South University

OBJECTIVES OF THE LECTURE

By the end of this lecture you will be able to:

o   *Conceptualize*

- *CVDs, NCDs*

- *Risk factors for heart attack , CVDs etc.*

- *Prevention of heart attack, CVDs etc.*

o   *Understand the complications of Dm, Obesity and cancer etc*

What is a heart attack?

- Heart attack (myocardial infarction): When heart muscle is damaged or dies due to lack of oxygen. Oxygen is carried to the heart by the arteries (blood vessels). Most heart attacks are caused by a blockage in these arteries. Usually the blockage is caused by atherosclerosis, which is the buildup of fatty deposits (called plaque) inside the artery. This buildup is like the gunk that builds up in a drainpipe and slows the flow of water.

- Heart attacks can also be caused by a blood clot that gets stuck in a narrow part of an artery to the heart. Clots are more likely to form where atherosclerosis has made an artery more narrow.

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Figure A shows a normal artery with normal blood flow. Figure B shows an artery with plaque buildup. Plaque narrows the arteries and reduces blood flow to your heart . It also makes it more likely that blood clots muscle will form in your arteries. Blood clots can partially or completely block blood flow Plaque narrows the arteries and reduces blood flow to your heart muscle. It also makes it more likely that blood clots will form in your arteries. Blood clots can partially or completely block blood flow

A Normal artery

Artery wall

Normal blood flow

Artery cross-section

Abnormal blood flow

Plaque

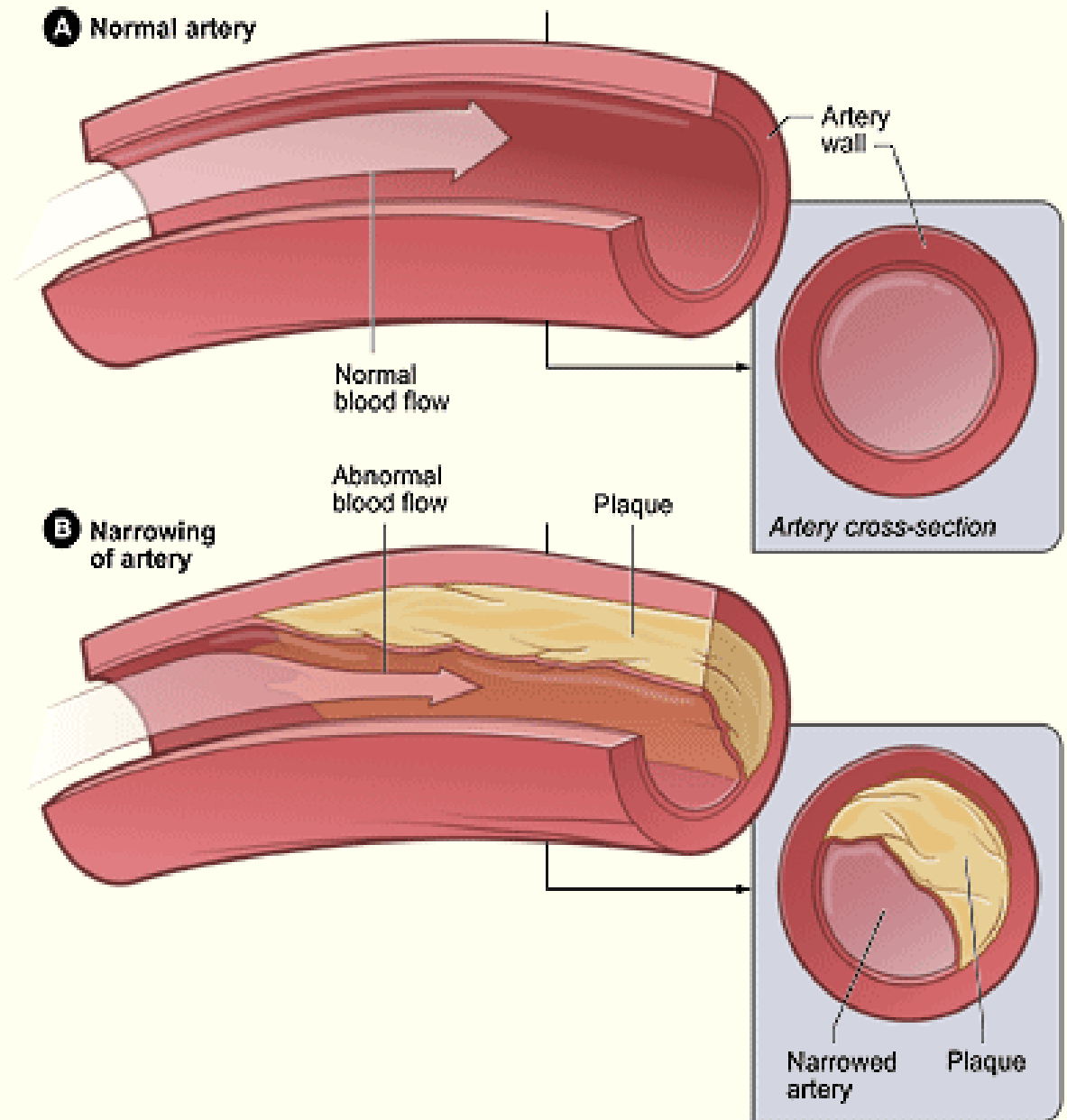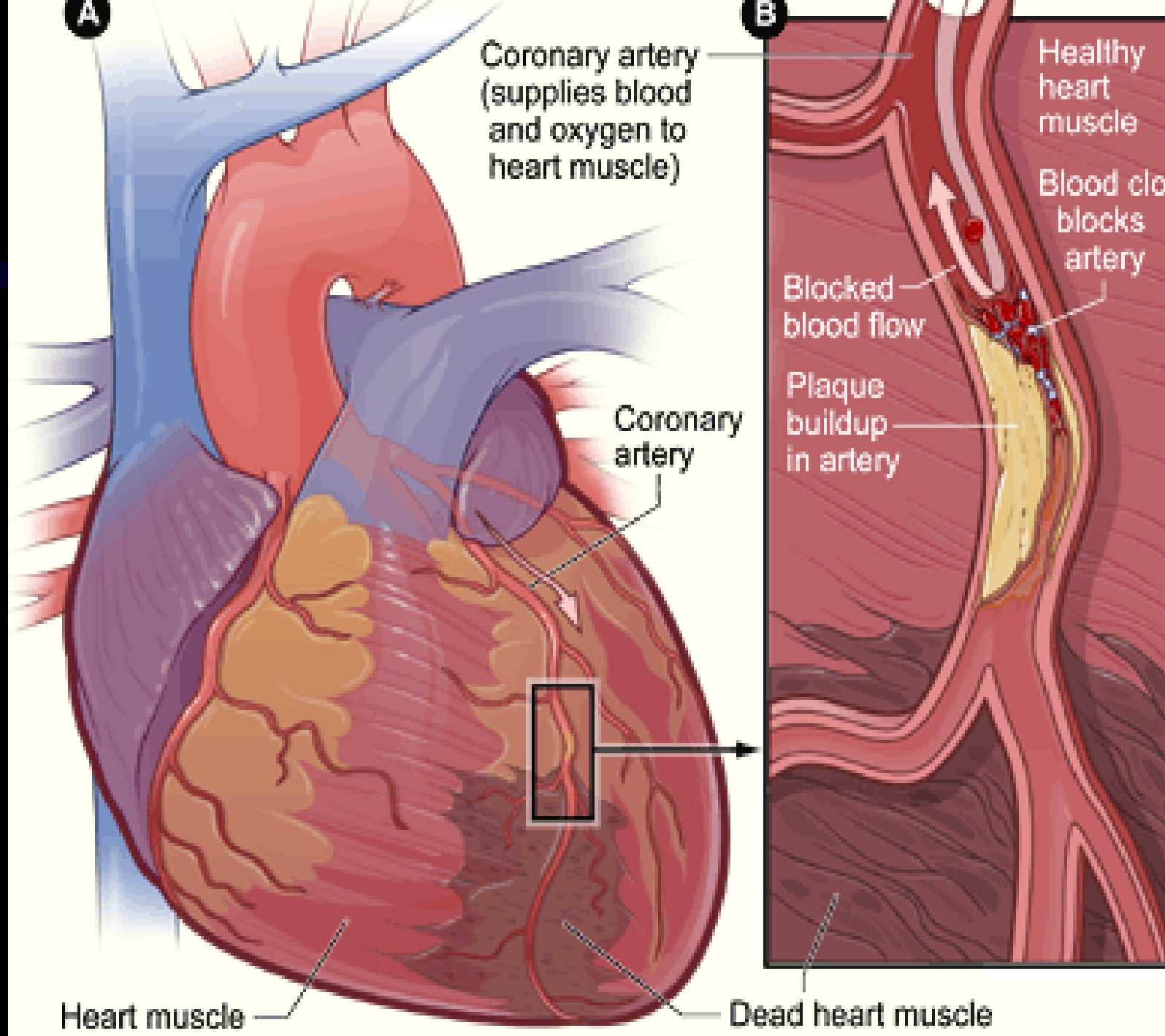**B** Narrowing of artery

Narrowed artery

Plaque

Figure A is an overview of a heart and coronary artery showing damage (dead heart muscle) caused by a heart attack. Figure B is a cross-section of the coronary artery with plaque buildup and a blood clot.

A

Coronary artery (supplies blood and oxygen to heart muscle)

Coronary artery

Heart muscle

B

Healthy heart muscle

Blood clot blocks artery

Blocked blood flow

Plaque buildup in artery

Dead heart muscle

How to know whether having a heart attack?

The pain of a heart attack can feel like bad heartburn. You may also be having a heart attack if you:

- Feel a pressure or crushing pain in your chest, sometimes with sweating, nausea or vomiting

- Feel pain that extends from your chest into the jaw, left arm or left shoulder.

- Feel tightness in your chest

- Have shortness of breath for more than a couple of seconds

- Don't ignore the pain or discomfort. If you think you are having heart problems or a heart attack, get help immediately. The sooner you get treatment, the greater the chance that the doctors can prevent further damage to the heart muscle.

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Risk factors for a heart attack

- Smoking
- Diabetes
- Increasing age
- High cholesterol level
- High blood pressure
- Family history of heart attack
- Atherosclerosis
- Lack of exercise
- Stress
- Obesity
- Anxiety

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Healthy Diet for Healthy Heart

Avoid Smoking & Alcohol Consumption

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How to avoid having a heart attack?

Talk to your family doctor about your specific risk factors for a heart attack and how to reduce your risk. Your doctor may tell you to do the following:

- **Quit smoking**. Your doctor can help you. (If you don't smoke, don't start!)

- **Eat a healthy diet**. Cut back on foods high in saturated fat and sodium (salt) to lower cholesterol and blood pressure. Ask your doctor about how to start eating a healthy diet.

- **Control your blood sugar if you have diabetes**.

- **Exercise**. This sounds hard if you haven't exercised for a while, but try to work up to at least 30 minutes of aerobic exercise (that raises your heart rate) at least 4 times a week.

- **Lose weight if you're overweight**. Your doctor can advise you about the best ways to lose weight.

- **Control your blood pressure if you have hypertension**.

Talk to your doctor about whether aspirin would help reduce your risk of a heart attack. Aspirin can help keep your blood from forming clots that can eventually block the arteries.

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What are Non-communicable diseases (NCDs)?

- NCD is a medical condition or disease, which is not infectious, not passed from person to person

- Long duration, relatively slow progression and largely preventable

- Usually called "Chronic Diseases"

- 4 main types of NCDs:

  – cardiovascular diseases (like heart attacks and stroke),

  – Cancers

  – Chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma)

  – Diabetes

Characteristics of NCDs

- Complex etiology (causes)
- Multiple risk factors
- Long latency period
- Non-contagious origin (noncommunicable)
- Prolonged course of illness
- Functional impairment or disability

Hypertension

- Also known as high blood pressure

- Long term medical condition

- Blood pressure persistently elevated in the arteries

- Usually doesn't cause symptoms

- Long term HBP is a major risk factor: stroke, heart failure, vision loss, chronic kidney disease

Stages of hypertension

- Normal: systolic 90- 119/ diastolic 60- 79

- High normal (pre hypertension): 120-139/ 80-89

- Stage 1 hypertension: 140–159/ 90–99

- Stage 2 hypertension: 160–179/ 100–109

- Stage 3 hypertension: ≥180/ ≥110

Symptoms

- rarely accompanied by symptoms
- Usually identified through screening, or when seeking healthcare for an unrelated problem
- Sometimes
  - Headache, specially back of head
  - Vertigo
  - Buzzing or hissing in the ear
  - Altered vision

Cardiovascular Diseases

- Diseases of the heart, vascular diseases of the brain and diseases of blood vessels.

- Responsible for over 17.3 million deaths per year and are the leading causes of death in the world

WHO. Global Atlas on Cardiovascular Disease Prevention and Control. Mendis S, Puska P, Norrving B editors. World Health Organization, Geneva 2011

HBP & CVD

- Stresses body's blood vessels, causing them to clog or weaken

- Narrows the blood vessels making them more likely to block from blood clots

- As people get older, systolic blood pressure becomes a more important predictor of the risk of cardiovascular disease
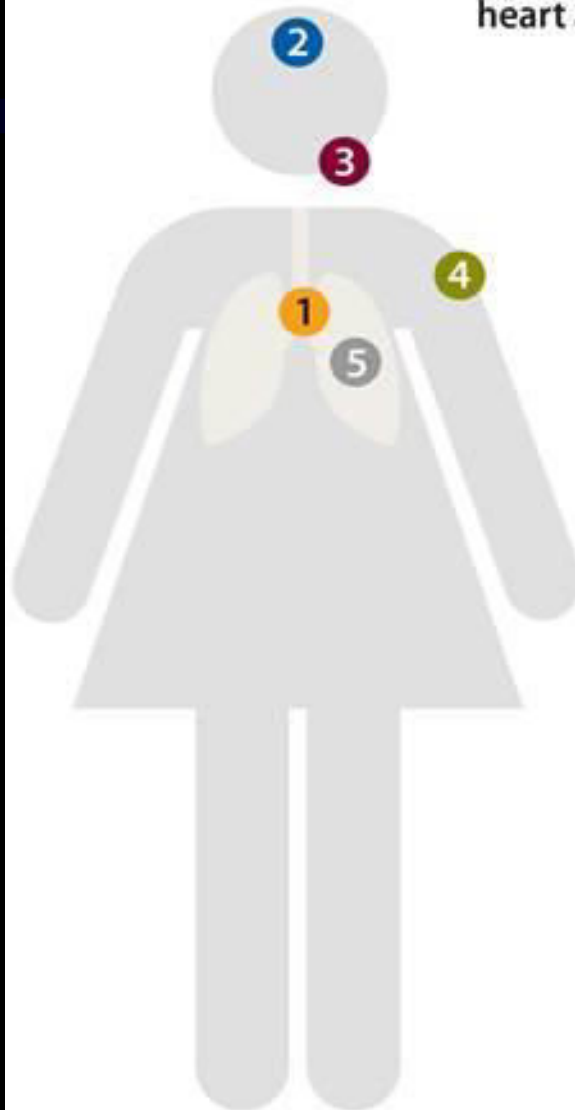
Heart attack: signs & symptoms

- The five major symptoms of a heart attack
  - Pain or discomfort in the jaw, neck, or back
  - Feeling weak, light-headed, or faint
  - Chest pain or discomfort
  - Pain or discomfort in arms or shoulder
  - Shortness of breath

Major signs and symptoms of a heart attack in women and men

1 Chest pain or discomfort
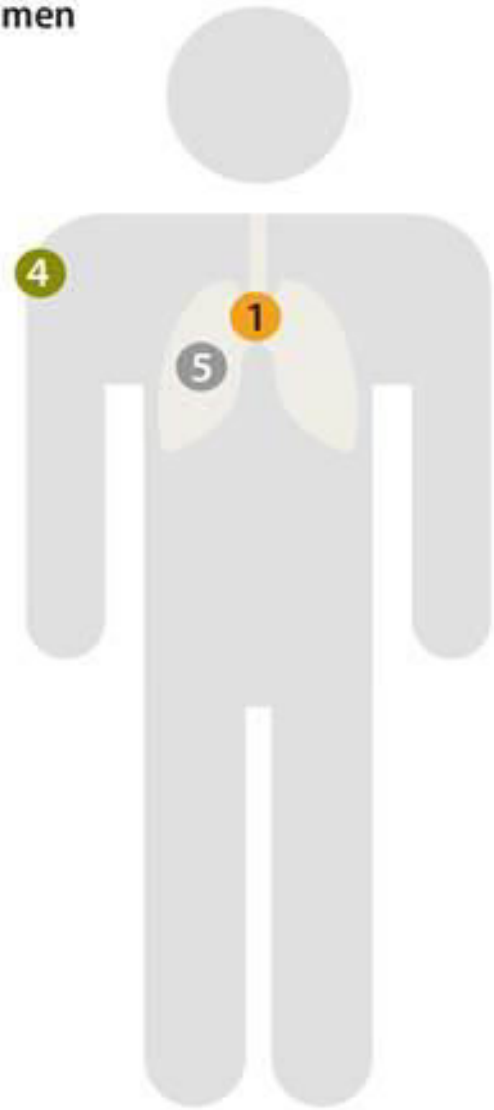
2 Nausea, feeling light-headed or unusually tired

3 Pain or discomfort in the jaw, neck, or back

4 Pain or discomfort in the arm or shoulder

5 Shortness of breath

Cancer

- 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)
- Benign tumors:
  - Do not penetrate adjacent tissue borders
  - Remain localize overgrowths in the area in which they arise
- Malignant tumors:
  - Capable to spread the neoplasms into adjacent structures
  - Implant neoplasms into noncontiguous sites

Global burden of cancer

- 7.6 million people died from cancer in 2008

- 70% of all cancer deaths occur in LMIC

- Deaths from cancer are estimated to reach 13.1 million by 2030

- About 30% of cancers are attributable to behavior risk factors.

Diabetes mellitus

- Symptoms

  - prolonged HBP

  - frequent urination

  - increased thirst & hunger

Two major forms of diabetes

- Type 1 diabetes: lack of insulin production

- Type 2 diabetes: Results from the body's ineffective use of insulin (most common)

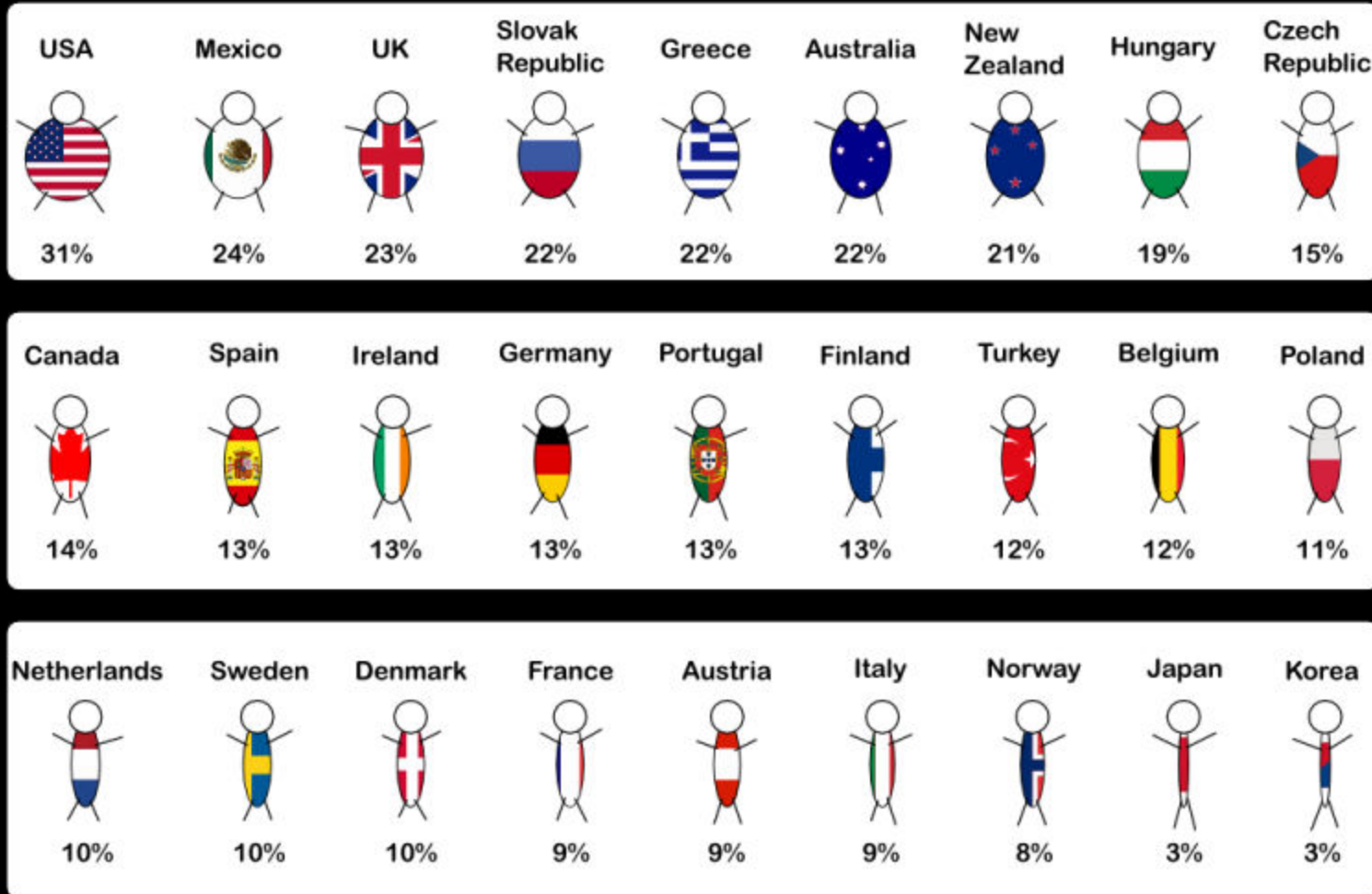**A third type of diabetes is gestational diabetes**

Diabetes

- Diabetes is predicted to become the seventh leading cause of death in the world by the year 2030

- Total deaths from diabetes are projected to rise by more than 50% in the next 10 years

- Cardiovascular disease is responsible for between 50% and 80% of deaths in people with diabetes

- Diabetes has become one of the major causes of premature illness and death in most countries, mainly through the increased risk of cardiovascular disease (CVD)

- Lack of awareness about diabetes, combined with insufficient access to health services and essential medicines, can lead to complications such as blindness, amputation and kidney failure.

OBESITY: The percentage of the population older than 15 with a body-mass index greater than 30.

USA	Mexico	UK	Slovak Republic	Greece	Australia	New Zealand	Hungary	Czech Republic
31%	24%	23%	22%	22%	22%	21%	19%	15%

Canada	Spain	Ireland	Germany	Portugal	Finland	Turkey	Belgium	Poland
14%	13%	13%	13%	13%	13%	12%	12%	11%

Netherlands	Sweden	Denmark	France	Austria	Italy	Norway	Japan	Korea
10%	10%	10%	9%	9%	9%	8%	3%	3%

- Worldwide obesity has more than doubled since 1980.

- In 2008, 1.5 billion adults, 20 and older, were overweight. Of these over 200 million men and nearly 300 million women were obese.

- 65% of the world's population live in countries where overweight and obesity kills more people than underweight.

- Nearly 43 million children under the age of five were overweight in 2010.

- Obesity is preventable

- Globally, 44% of diabetes, 23% of ischaemic heart disease and 7–41% of certain cancers are attributable to overweight and obesity

SODA

20 Years Ago

Today

85 Calories
6.5 ounces

250 Calories
20 ounces

Calorie Difference: 165 Calories

Risk factors & prevention

- Unhealthy diet
  - Daily calories
  - Fat and meats
  - Energy dense and nutrient-poor foods : Refined sugars, Trans-fats
- Unhealthy Diet: Health Effects
  - Coronary heart disease
  - Stroke
  - Cancer
  - Type 2 diabetes
  - Hypertension
  - Obesity

The Benefits of Physical Activity

Regular physical activity is one of the **most important things** you can do for your health

- Control your weight
- Reduce your risk of cardiovascular disease
- Reduce your risk for type 2 diabetes
- Reduce your risk of some cancers (colon, breast, lung cancers)
- Strengthen your bones and muscles
- Improve your mental health and mood
- Improve your ability to do daily activities and prevent falls, if you're an older adult
- Increase your chances of living longer

CDC, 2011

Physical activity and health effects

- Reduces:
  - High blood pressure
  - Adverse lipid profile
  - Arthritis pain
  - Type 2 diabetes
  - Heart attacks
  - Stroke
  - Early death

Why NCDs Are Important in Public Health?

- NCDs kill 38 million people each year

- Almost three quarters of NCD deaths - 28 million - occur in LMIC

- Sixteen million NCD deaths occur before the age of 70; 82% of these "premature" deaths occurred in LMIC

- Cardiovascular diseases account for most NCD deaths, or 17.5 million people annually, followed by cancers (8.2 million), respiratory diseases (4 million), and diabetes (1.5 million).

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