

# Non-Communicable Diseases

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## Non-Communicable Diseases

- Noncommunicable - or chronic - diseases (NCDs) are diseases of long duration and generally slow progression.
- These conditions do not result from an (acute) infectious process and hence are “not communicable.”; have a prolonged course, do not resolve spontaneously, and for which a complete cure is rarely achieved.
- NCDs tend to be of long duration and are the result of a combination of genetic, physiological, environmental and behavioural factors.
- These invisible diseases are an under-appreciated cause of poverty and hinder the economic development of many countries. The burden is growing - the number of people, families and communities afflicted is increasing.
- NCDs are the leading cause of mortality in the world.
- NCDs disproportionately affect people in low- and middle-income countries where more than three quarters of global NCD deaths – 31.4 million – occur.

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## Non-Communicable Diseases

- People of all age groups, regions and countries are affected by NCDs. These conditions are often associated with older age groups, but evidence shows that more than 15 million of all deaths attributed to NCDs occur between the ages of 30 and 69 years. Of these "premature" deaths, 85% are estimated to occur in low- and middle-income countries. Children, adults and the elderly are all vulnerable to the risk factors contributing to NCDs, whether from unhealthy diets, physical inactivity, exposure to tobacco smoke or the harmful use of alcohol.
- NCDs are driven by forces that include rapid unplanned urbanization, globalization of unhealthy lifestyles and population ageing. Unhealthy diets and a lack of physical activity may show up in people as raised blood pressure, increased blood glucose, elevated blood lipids and obesity. These are called metabolic risk factors that can lead to cardiovascular disease, the leading NCD in terms of premature deaths.

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## Characteristics of NCDs

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

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## Non-Communicable Diseases

- The four main types of noncommunicable diseases are: cardiovascular diseases, cancer, chronic respiratory diseases, and diabetes. Others include, but are not limited to, Chronic neurologic disorders (e.g., Alzheimer's, dementias); Arthritis/Musculoskeletal diseases; and Unintentional injuries.
- NCDs are by far the leading cause of death in the world, representing 63% of all annual deaths. NCDs kill more than 36 million people each year. Some 80% of all NCD deaths occur in low- and middle-income countries.
- NCD deaths worldwide now exceed all communicable, maternal and perinatal nutrition-related deaths combined and represent an emerging global health threat.
- More than 9 million of all deaths attributed to NCDs occur before the age of 60.

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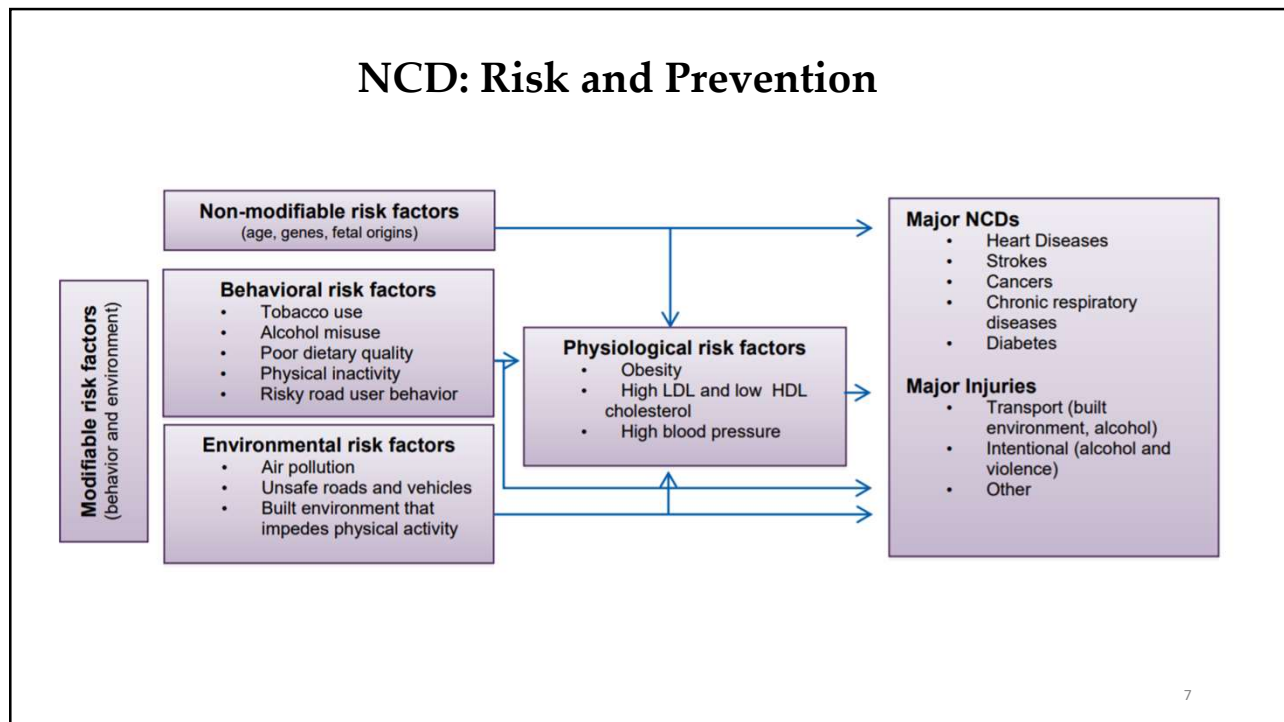
## Non-Communicable Diseases

- Around the world, NCDs affect women and men almost equally.
- Noncommunicable diseases force many people into, or entrench them in poverty due to catastrophic expenditures for treatment. They also have a large impact on undercutting productivity.
- Eliminating major risks could prevent most NCDs: If the major risk factors for noncommunicable diseases were eliminated, at around three-quarters of heart disease, stroke and type 2 diabetes would be prevented; and 40% of cancer would be prevented. (see next slides for more details on risk factors).

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## NCD: Risk and Prevention



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## Risk Factor: Definition

- **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 can be reduced or controlled by intervention, thereby reducing the probability of disease. WHO has prioritized the following four: – Physical inactivity, – Tobacco use, – Alcohol use, and – Unhealthy diets (increased fat and sodium, with low fruit and vegetable intake).
- **Non-Modifiable Risk Factor:** A risk factor that cannot be reduced or controlled by intervention; for example: Age, Gender, Race, and Family history (genetics).

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## Risk factors

- Common, modifiable, preventable risk factors underlie most noncommunicable diseases.
- Most noncommunicable diseases are the result of four particular behavior:
  1. tobacco use, 2. physical inactivity, 3. unhealthy diet, and 4. the harmful use of alcohol.
- These four behaviors lead to four key metabolic/physiological changes: 1. raised blood pressure, 2. overweight/obesity, 3. raised blood glucose and 4. raised cholesterol.
- Noncommunicable diseases are preventable through effective interventions that tackle shared risk factors, namely: tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol.

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### Noncommunicable Diseases 4 Diseases, 4 Modifiable Shared Risk Factors

	Tobacco Use	Unhealthy diets	Physical Inactivity	Harmful Use of Alcohol
Cardio-vascular				
Diabetes				
Cancer				
Chronic Respiratory				

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## 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:
  - Raised blood pressure
  - Raised total cholesterol
  - Elevated glucose
  - Overweight and obesity

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## The socioeconomic impact of NCDs

- NCDs threaten progress towards the 2030 Agenda for Sustainable Development, which includes a target of reducing premature deaths from NCDs by one-third by 2030.
- Poverty is closely linked with NCDs. The rapid rise in NCDs is predicted to impede poverty reduction initiatives in low-income countries, particularly by increasing household costs associated with health care. Vulnerable and socially disadvantaged people get sicker and die sooner than people of higher social positions, especially because they are at greater risk of being exposed to harmful products, such as tobacco, or unhealthy dietary practices, and have limited access to health services.
- In low-resource settings, health-care costs for NCDs quickly drain household resources. The exorbitant costs of NCDs, including treatment which is often lengthy and expensive, combined with loss of income, force millions of people into poverty annually and stifle development.

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## Prevention and control of NCDs

- An important way to control NCDs is to focus on reducing the risk factors associated with these diseases. Low-cost solutions exist for governments and other stakeholders to reduce the common modifiable risk factors. Monitoring progress and trends of NCDs and their risk is important for guiding policy and priorities.
- To lessen the impact of NCDs on individuals and society, a comprehensive approach is needed requiring all sectors, including health, finance, transport, education, agriculture, planning and others, to collaborate to reduce the risks associated with NCDs, and to promote interventions to prevent and control them.

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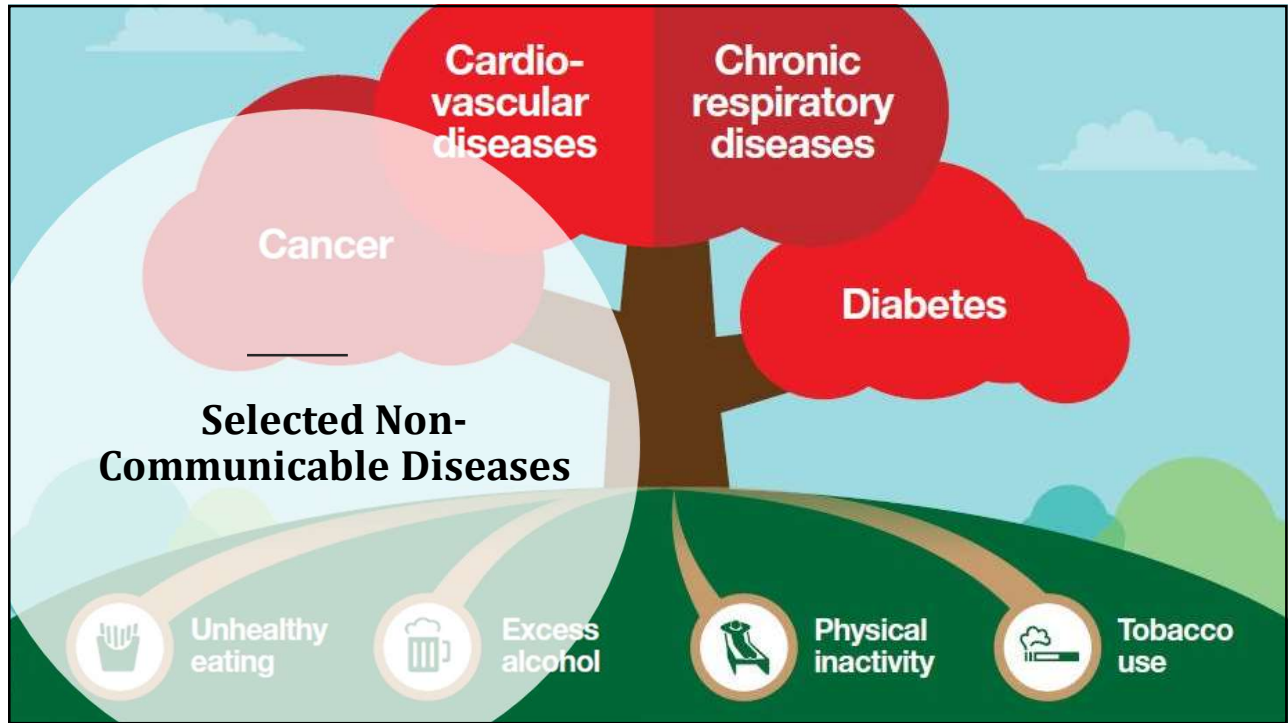
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## Prevention and control of NCDs

- Investing in better management of NCDs is critical. Management of NCDs includes detecting, screening and treating these diseases, and providing access to palliative care for people in need. High impact essential NCD interventions can be delivered through a primary health care approach to strengthen early detection and timely treatment. Evidence shows such interventions are excellent economic investments because, if provided early to patients, they can reduce the need for more expensive treatment.
- Countries with inadequate health insurance coverage are unlikely to provide universal access to essential NCD interventions. NCD management interventions are essential for achieving the global target of a 25% relative reduction in the risk of premature mortality from NCDs by 2025, and the SDG target of a one-third reduction in premature deaths from NCDs by 2030.

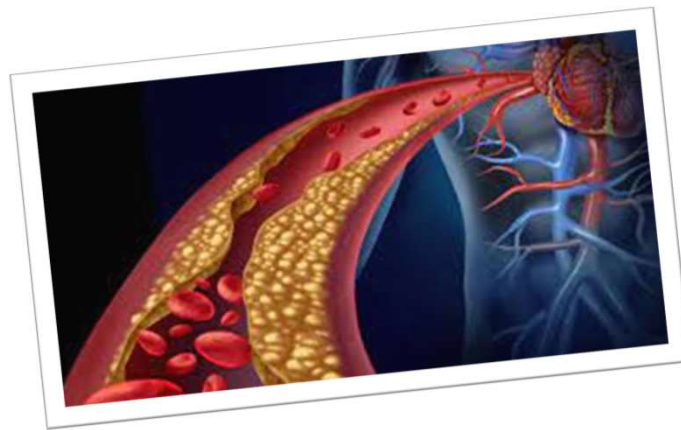
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## Cardiovascular Diseases



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## Cardiovascular Diseases

- Cardiovascular disease (CVD) is a group of disorders of the heart and blood vessels and they include:
  - coronary heart disease – disease of the blood vessels supplying the heart muscle;
  - cerebrovascular disease – disease of the blood vessels supplying the brain;
  - peripheral arterial disease – disease of blood vessels supplying the arms and legs;
  - rheumatic heart disease – damage to the heart muscle and heart valves from rheumatic fever, caused by streptococcal bacteria;
  - congenital heart disease – malformations of heart structure existing at birth;
  - deep vein thrombosis and pulmonary embolism – blood clots in the leg veins, which can dislodge and move to the heart and lungs.

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## Global Burden of Cardiovascular Disease

- CVDs are the #1 cause of death globally taking an estimated 17.9 million lives each year (Almost 30% of all global deaths).
- More people die annually from CVDs than from any other cause.
- Four out of 5 CVD deaths are due to heart attacks and strokes, and one third of these deaths occur prematurely in people under 70 years of age.
- Over 80% CVD deaths occur in low- and middle- income countries.
- By 2030, almost 25 million people will die from CVDs

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## Cardiovascular Disease: Risk Factors

- **Major modifiable risk factors:** - High blood pressure - Abnormal blood lipids - Tobacco use - Physical inactivity - Obesity - Unhealthy diet (salt) - Diabetes
- **Other modifiable risk factors:** - Low socioeconomic status - Mental ill health (depression) - Psychosocial stress - Heavy alcohol use - Use of certain medication - Lipoprotein(a)
- **Non-modifiable risk factors:** - Age - Heredity or family history - Gender - Ethnicity or race
- **“Novel” risk factors:** - Excess homocysteine in blood - Inflammatory markers (Creactive protein) - Abnormal blood coagulation (elevated blood levels of fibrinogen)

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## Cardiovascular Disease: Risk Factors

- The most important behavioural risk factors of heart disease and stroke are unhealthy diet, physical inactivity, tobacco use and harmful use of alcohol. The effects of behavioural risk factors may show up in individuals as raised blood pressure, raised blood glucose, raised blood lipids, and overweight and obesity. These “intermediate risks factors” can be measured in primary care facilities and indicate an increased risk of heart attack, stroke, heart failure and other complications.
- Cessation of tobacco use, reduction of salt in the diet, eating more fruit and vegetables, regular physical activity and avoiding harmful use of alcohol have been shown to reduce the risk of cardiovascular disease. Health policies that create conducive environments for making healthy choices affordable and available are essential for motivating people to adopt and sustain healthy behaviours.

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## Cardiovascular Disease: Symptoms

- Often, there are no symptoms of the underlying disease of the blood vessels. A heart attack or stroke may be the first sign of underlying disease.
- ❖ Symptoms of a heart attack include:
  - pain or discomfort in the centre of the chest; and/or
  - pain or discomfort in the arms, the left shoulder, elbows, jaw, or back.
  - In addition the person may experience difficulty in breathing or shortness of breath; nausea or vomiting; light-headedness or faintness; a cold sweat; and turning pale. Women are more likely than men to have shortness of breath, nausea, vomiting, and back or jaw pain.

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## Cardiovascular Disease: Symptoms

- ❖ The most common symptom of a stroke is sudden weakness of the face, arm, or leg, most often on one side of the body. Other symptoms include sudden onset of:
  - numbness of the face, arm, or leg, especially on one side of the body;
  - confusion, difficulty speaking or understanding speech;
  - difficulty seeing with one or both eyes;
  - difficulty walking, dizziness and/or loss of balance or coordination;
  - severe headache with no known cause; and/or
  - fainting or unconsciousness.

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## Why are cardiovascular diseases a development issue in low- and middle-income countries?

- People in low- and middle-income countries often do not have the benefit of integrated primary health care programmes for early detection and treatment of people with risk factors compared to people in high-income countries.
- People in low- and middle-income countries who suffer from CVDs and other noncommunicable diseases have less access to effective and equitable health care services which respond to their needs. As a result, many people in low- and middle-income countries are detected late in the course of the disease and die younger from CVDs and other noncommunicable diseases, often in their most productive years.
- The poorest people in low- and middle-income countries are affected most. At the household level, sufficient evidence is emerging to prove that CVDs and other noncommunicable diseases contribute to poverty due to catastrophic health spending and high out-of-pocket expenditure.

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## How can the burden of cardiovascular diseases be reduced?

- “Best buys” or very cost effective interventions that are feasible to be implemented even in low-resource settings have been identified by WHO for prevention and control of cardiovascular diseases. They include two types of interventions: population-wide and individual, which are recommended to be used in combination to reduce the greatest cardiovascular disease burden.
- Examples of population-wide interventions that can be implemented to reduce CVDs include:
  - comprehensive tobacco control policies
  - taxation to reduce the intake of foods that are high in fat, sugar and salt
  - building walking and cycle paths to increase physical activity
  - strategies to reduce harmful use of alcohol
  - providing healthy school meals to children.

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## How can the burden of cardiovascular diseases be reduced?

- At the individual level, for prevention of first heart attacks and strokes, individual health-care interventions need to be targeted to those at high total cardiovascular risk or those with single risk factor levels above traditional thresholds, such as hypertension and hypercholesterolemia. The former approach is more cost-effective than the latter and has the potential to substantially reduce cardiovascular events. This approach is feasible in primary care in low-resource settings, including by non-physician health workers.
- For secondary prevention of cardiovascular disease in those with established disease, including diabetes, treatment with the following medications are necessary:
  - aspirin
  - beta-blockers
  - angiotensin-converting enzyme inhibitors
  - statins.

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## Diabetes



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## Diabetes

- Diabetes is a disorder of metabolism— the way the body uses digested food for growth and energy.
- There are 4 types: Type 1, Type 2, Gestational, and 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

- Diabetes is a chronic, metabolic disease characterized by elevated levels of blood glucose (or blood sugar), which leads over time to serious damage to the heart, blood vessels, eyes, kidneys and nerves. The most common is type 2 diabetes, usually in adults, which occurs when the body becomes resistant to insulin or doesn't make enough insulin. In the past three decades the prevalence of type 2 diabetes has risen dramatically in countries of all income levels. Type 1 diabetes, once known as juvenile diabetes or insulin-dependent diabetes, is a chronic condition in which the pancreas produces little or no insulin by itself. For people living with diabetes, access to affordable treatment, including insulin, is critical to their survival. There is a globally agreed target to halt the rise in diabetes and obesity by 2025.

## Diabetes: Burden of Disease

- 347 million people worldwide have diabetes.
- 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.

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## Diabetes: Risk Factors

- **Major modifiable Risk Factors:** - Unhealthy diets - Physical Inactivity - Obesity or Overweight - High Blood Pressure - High Cholesterol
- **Other Modifiable Risk Factors:** - Low socioeconomic status - Heavy alcohol use - Psychological stress - High consumption of sugar-sweetened beverages - Low consumption of fiber
- **Non-modifiable Risk Factors:** - Increased age - Family history/genetics - Race - Distribution of fat
- **Other Risk Factors:** - Low birth weight - Presence of autoantibodies

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## Diabetes: Symptoms

- Symptoms of type 1 diabetes include the need to urinate often, thirst, constant hunger, weight loss, vision changes and fatigue. These symptoms may occur suddenly. Symptoms for type 2 diabetes are generally similar to those of type 1 diabetes, but are often less marked. As a result, the disease may be diagnosed several years after onset, after complications have already arisen. For this reason, it is important to be aware of risk factors.

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## Diabetes: Prevention and Treatment

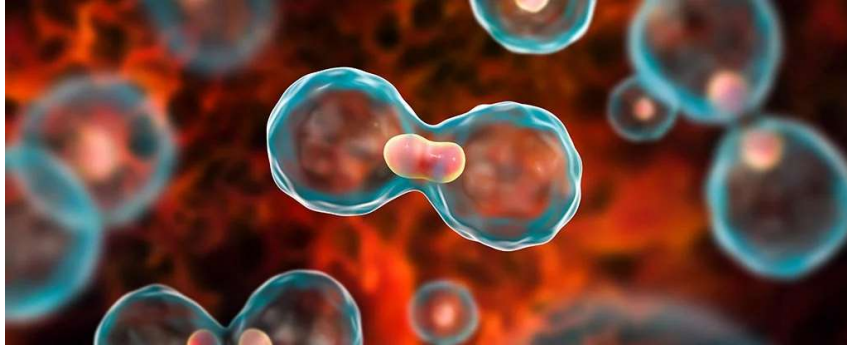
- Type 1 diabetes cannot currently be prevented. Effective approaches are available to prevent type 2 diabetes and to prevent the complications and premature death that can result from all types of diabetes. These include policies and practices across whole populations and within specific settings (school, home, workplace) that contribute to good health for everyone, regardless of whether they have diabetes, such as exercising regularly, eating healthily, avoiding smoking, and controlling blood pressure and lipids.
- A series of cost-effective interventions can improve patient outcomes, regardless of what type of diabetes they may have. These interventions include blood glucose control, through a combination of diet, physical activity and, if necessary, medication; control of blood pressure and lipids to reduce cardiovascular risk and other complications; and regular screening for damage to the eyes, kidneys and feet, to facilitate early treatment.

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# Cancer



# Cancer

- Cancer is a large group of diseases that can start in almost any organ or tissue of the body when abnormal cells grow uncontrollably, go beyond their usual boundaries to invade adjoining parts of the body and/or spread to other organs. The latter process is called metastasizing and is a major cause of death from cancer. A neoplasm and malignant tumour are other common names for cancer.

## Cancer

- “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
- Malignant tumors

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## Global Burden of Cancer

- Cancer is the second leading cause of death globally, accounting for an estimated 9.6 million deaths, or one in six deaths, in 2018. Lung, prostate, colorectal, stomach and liver cancer are the most common types of cancer in men, while breast, colorectal, lung, cervical and thyroid cancer are the most common among women.
- 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.

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## Cancer Prevention

- Between 30% and 50% of cancer deaths could be prevented by modifying or avoiding key risk factors and implementing existing evidence-based prevention strategies. The cancer burden can also be reduced through early detection of cancer and management of patients who develop cancer. Prevention also offers the most cost-effective long-term strategy for the control of cancer.

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## Cancer Prevention

### **Modifying or avoiding the following key risk factors can help prevent cancer:**

- avoid tobacco use, including cigarettes and smokeless tobacco
- maintain a healthy weight
- eat a healthy diet with plenty of fruit and vegetables
- exercise regularly
- limit alcohol use
- practice safe sex
- get vaccinated against hepatitis B and human papillomavirus (HPV)
- reduce exposure to ultraviolet radiation
- prevent unnecessary ionizing radiation exposure (e.g. minimize occupational exposure, ensure safe and appropriate medical use of radiation in diagnosis and treatment)
- avoid urban air pollution and indoor smoke from household use of solid fuels
- get regular medical care
- some chronic infections are also risk factors for cancer. People in low- and middle-income countries are more likely to develop cancer through chronic infections.

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## Cancer Management

- Cancer is more likely to respond to effective treatment when identified early, resulting in a greater probability of surviving as well as less morbidity and less expensive treatment.
- There are two distinct strategies that promote early detection:
  1. Early diagnosis identifies symptomatic cancer cases at the earliest possible stage.
  2. Screening aims to identify individuals with abnormalities suggestive of a specific cancer or pre-cancer who have not developed any symptoms and refer them promptly for diagnosis and treatment.

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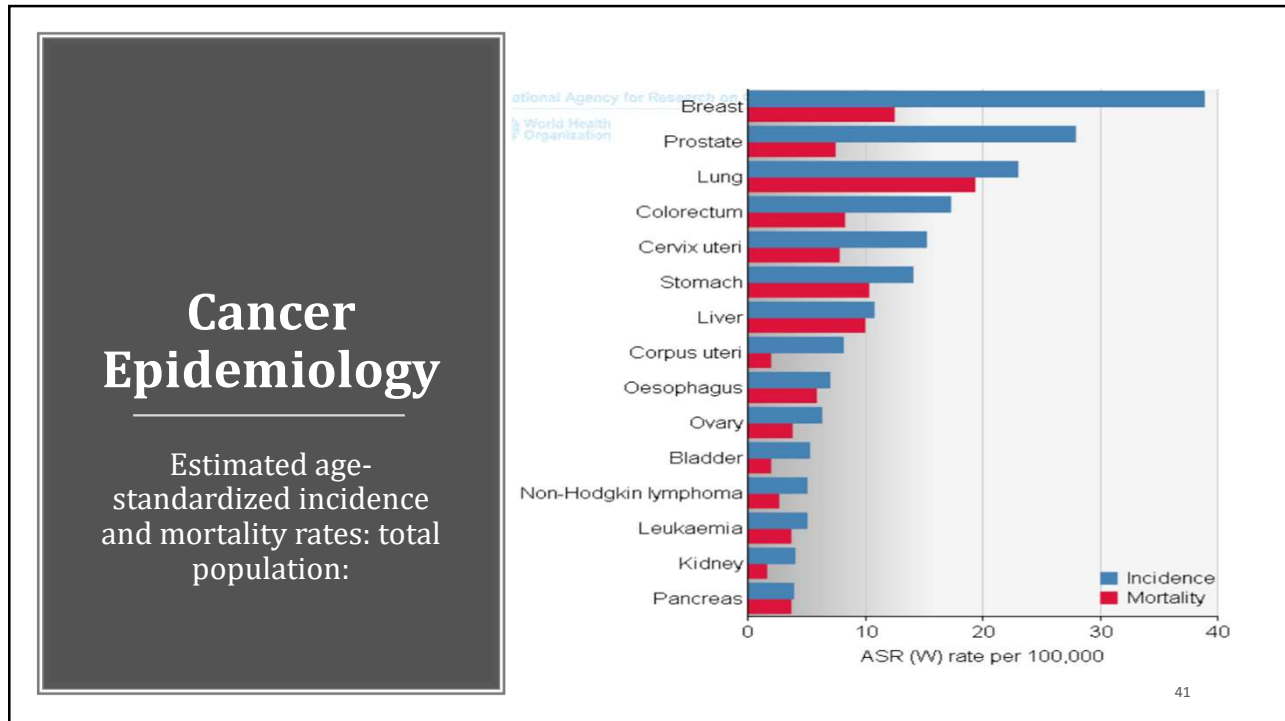
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## Cancer Management

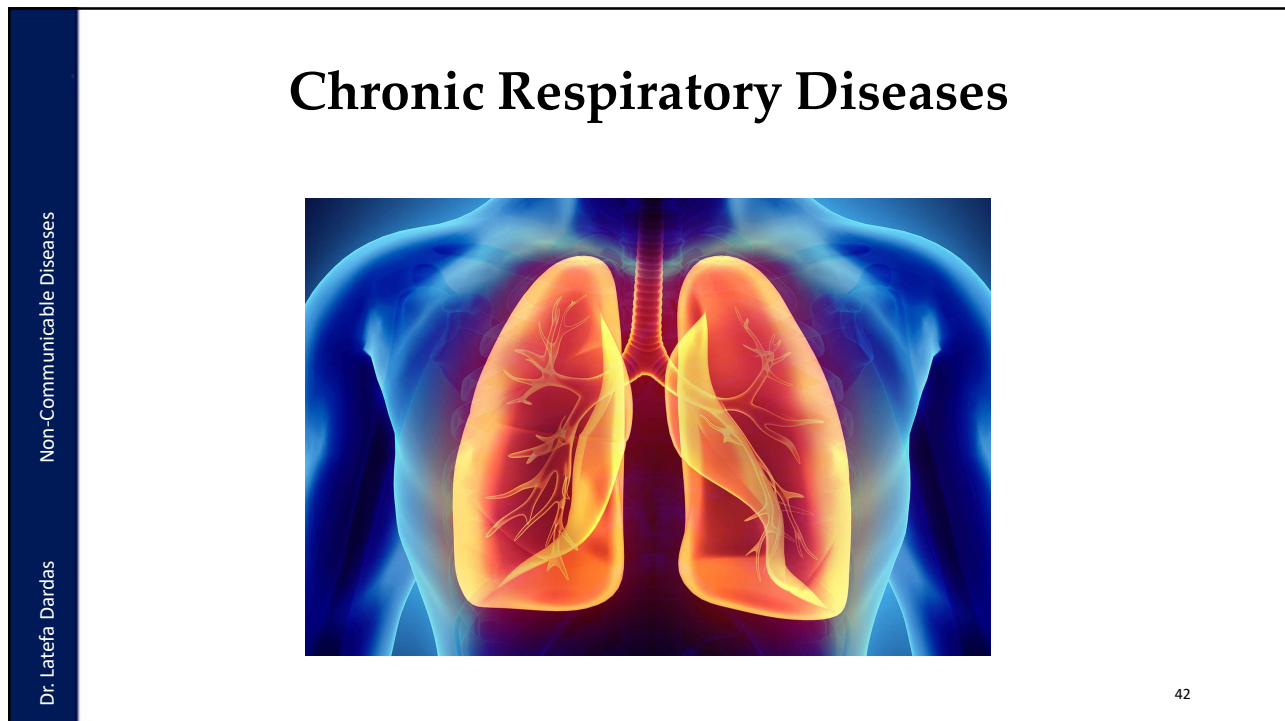
- Treatment options include surgery, cancer medicines and/or radiotherapy, administered alone or in combination. A multidisciplinary team of cancer professionals recommends the best possible treatment plan based on tumour type, cancer stage, clinical and other factors. The choice of treatment should be informed by patients' preferences and consider the capacity of the health system.
- Palliative care, which focuses on improving the quality of life of patients and their families, is an essential component of cancer care. Survivorship care includes a detailed plan for monitoring cancer recurrence and detection of new cancers, assessing and managing long-term effects associated with cancer and/or its treatment, and services to ensure that cancer survivor needs are met.

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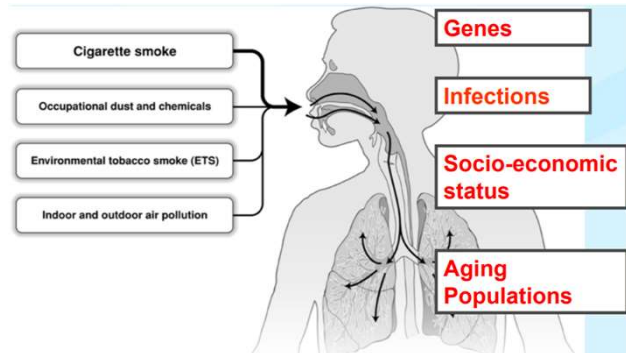
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## Chronic Respiratory Diseases

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



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## Chronic Respiratory Diseases: Symptoms

- Chronic respiratory diseases are chronic diseases of the airways and other structures of the lung. Two of the most common are asthma and chronic obstructive pulmonary disease (COPD).
- Asthma is a chronic, noncommunicable disease characterized by recurrent attacks of breathlessness and wheezing, which vary in severity and frequency from person to person. Symptoms may occur several times in a day or week in affected individuals, and for some people become worse during physical activity or at night. Asthma is the most common chronic disease among children.
- COPD is not one single disease but an umbrella term used to describe chronic lung diseases that cause limitations in lung airflow. The most common symptoms of COPD are breathlessness, or a 'need for air', excessive sputum production and a chronic cough.

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## Chronic Respiratory Diseases: Treatment

- Treatments for each chronic respiratory disease vary and the ideal solution is the reduction and avoidance of risk factors. Neither asthma nor chronic obstructive pulmonary disease (COPD) can be cured but treatments can reduce symptoms, prevent escalation and improve quality of life.
- Appropriate management of asthma through medications like inhaled corticosteroids can control the progression of the disease and reduce deaths. Daily, long-term medication is required for people with persistent symptoms and triggering settings should be avoided.

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## Non-Communicable Diseases: WHO Response

- Reducing the major risk factors of NCDs – primarily tobacco use, an unhealthy diet, harmful use of alcohol and physical inactivity – is the focus of WHO's Department for the Prevention of NCDs. In 2013, WHO develop the Global action plan for the prevention and control of NCDs 2013-2020. The plan included nine global targets with the greatest impact towards prevention and management of NCDs.
- Noncommunicable diseases are recognized as a major global challenge in the United Nation's 2030 Agenda for sustainable development. The Agenda sets the goal of reducing premature deaths from NCDs by one third by 2030 through prevention and treatment. WHO plays a key leadership role in the coordination and promotion of the global fight against NCDs and the achievement of the Sustainable Development Goals target 3.4.
- In 2014, WHO launched the Global coordination mechanism on the prevention and control of noncommunicable diseases (GCM/NCD). The first of its kind, this instrument helps Member States, UN organizations and partners to engage in cross-sectoral collaboration to prevent and control noncommunicable diseases.

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## 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, and
  - Exposure linked to more than one health condition.
  
- Interventions that target risk factors are needed to prevent disease.

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## Risk Factor Surveillance



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