



A Fact File on NON-COMMUNICABLE DISEASES



(A Joint Publication of the NAM S&T Centre and JSS Medical College, JSS Academy of Higher Education & Research, Mysuru, India)

FROM THE DG'S DESK

Warmest Greetings to all our Esteemed Readers!

Non-communicable Diseases (NCDs) are medical conditions that are not caused by infectious agents and cannot be transmitted from person to person. They are usually chronic and progress slowly over time. The four main types of NCDs that are directly linked to increased morbidity and mortality are: cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes. Common behavioural risk factors associated with NCDs are: tobacco use; harmful use of alcohol; unhealthy diet and physical inactivity which in turn contribute to metabolic changes that increase the risk of NCDs such as: high blood pressure (hypertension), overweight/obesity; high blood glucose levels (diabetes) and abnormal blood lipids (high cholesterol). An important way to control NCDs is to focus on reducing the risk factors associated with these diseases and monitoring their progress and trends.

Recognizing the paramount importance of this health issue, the NAM S&T Centre is pleased to publish this Fact File on "**Non-Communicable Diseases**" jointly with the JSS Medical College, JSS Academy of Higher Education & Research (JSSAHER), Mysuru, India. This document provides an overview of non-communicable diseases and their main types; percentage of total deaths due to NCDs in various regions; non-modifiable, modifiable and metabolic and environmental risk factors associated with NCDs and strategies that can be adopted for prevention and control of NCDs to reduce their impacts.

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Happy Reading!!!

Amitava Bandyopadhyay
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Introduction

According to the World Health Organization (WHO), "*Non-communicable diseases (NCDs), also known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological, environmental and behavioral factors.*" Typically, these are the group of diseases which do not get transmitted from man to man, either through direct or indirect routes of transmission. Non communicable diseases are prominently recognized as the significant causes of mortality worldwide. Once considered to be the diseases of urban populations, NCDs have now extended their roots in rural as well as tribal communities.

Major contributing factors for non-communicable diseases include increased life expectancy, globalization of unhealthy lifestyles, rampant unplanned urbanization. The sedentary lifestyle with lack of physical exercise, increased levels of stress and unhealthy dietary habits result in increased incidence of raised blood pressure, increased blood glucose levels, elevated lipid levels, overweight and obesity. These are known as metabolic risk factors and can lead to cardiovascular diseases which are the leading types of NCDs resulting in premature mortality.

What are different non communicable diseases?

The main types of non-communicable diseases are:

Four Main Types	Others / Risk factors
1. Cardiovascular diseases, like coronary heart disease (heart attacks) and Cerebrovascular diseases (stroke)	DYSLIPIDEMIA OBESITY
2. Cancers	OSTEOPENIA/OSTEOPOROSIS
3. Chronic respiratory diseases, like Chronic Obstructive Pulmonary Disease (COPD) and Asthma	RHEUMATOID ARTHRITIS DEGENERATIVE DISC DISEASE SARCOPENIA/FRAILITY
4. Diabetes Mellitus	MENTAL HEALTH PROBLEMS
5. Hypertension	NEURODEGENERATIVE DISEASES

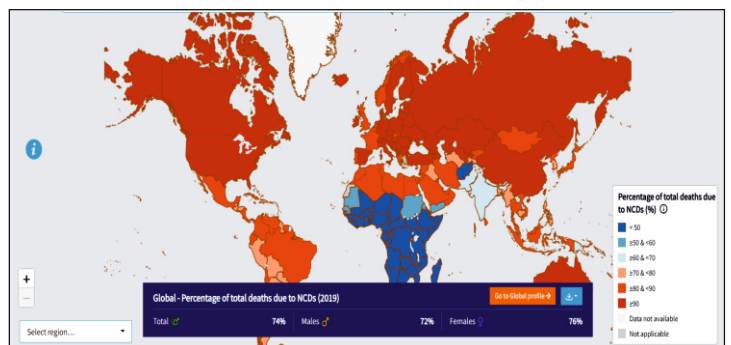
Burden of Non-Communicable Diseases

Non-communicable diseases (NCDs) account for mortality of 41 million people globally, which is equivalent to 74% of all deaths every year. Annually 17 million people die before the age of 70 years due to NCDs. Low and middle-income countries contribute to 86% of these premature deaths due to NCDs.

The largest contributors for mortality among NCDs are the cardiovascular diseases (17.9 million). These are followed by mortality due to cancers (9.3 million), chronic respiratory diseases (4.1 million) and diabetes (2.0 million including kidney disease deaths caused by diabetes). These four sets of diseases account for around 80% of premature deaths due to NCDs annually.

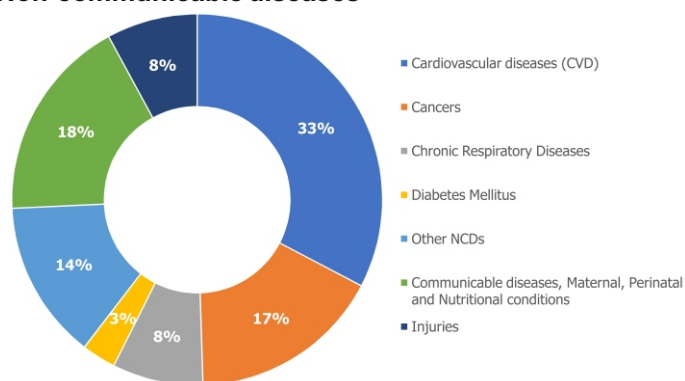
Almost all the WHO regions contribute significantly to the morbidity and mortality associated with NCDs. The details of region wise distribution of NCD burden are described in the subsequent paragraphs.

Percentage of total deaths due to NCDs



Adapted from: <https://ncdportal.org/> (WHO portal on Non Communicable Diseases)

Proportionate Mortality Rate for Various Diseases/Health Conditions depicting 74% mortality due to Non-communicable diseases



European Region

Non-communicable diseases (NCDs) are the major public health challenges in WHO European Region. 90% of deaths and 85% of years lived with disability are attributed to four major types of NCDs, namely, cardiovascular disease, cancer, diabetes and chronic respiratory diseases in European regions. Every fifth male and every tenth female in this region die before the age of 70 years due to these four major NCDs. Compared to other WHO regions, the European region has made significant progress in reducing premature mortality due to NCDs.

Western Pacific Region

There is a disproportionate burden of morbidity and mortality associated with NCDs in the Western Pacific Region. Four major NCDs account for nearly 12 million deaths in the year 2019 which accounts to 87% of all deaths in the Region that year. Probability of premature mortality from any of the four major types of NCDs ranges from 7% in the Republic of Korea to nearly 51% in Kiribati in the Western Pacific Region. These premature deaths are larger among lower- and middle-income countries in the region and within the countries a significant proportion of these deaths occur in the working age population and socio-economically disadvantaged groups.

South-East Asia Region

Nearly two thirds of all the deaths in the countries of South-East Asian region are attributed to the non-communicable diseases. Half of these deaths are reported in the age group of 30 to 69 years. Among the total deaths related to NCDs, 3.9 million are accounted for cardiovascular diseases followed by cancers, chronic respiratory diseases and diabetes related complications. There is a declining trend of premature mortality associated with NCDs in the region as evidenced by reduction in mortality rates from 23.5% in 2010 to 21.6% in 2019. However, this decline may not yield the achievement of targets under the sustainable development goal 3.4.

African Region

In the WHO African Region, NCDs are increasingly becoming the main cause of mortality. There is a 13% rise in the mortalities attributed to NCDs from the year 2000 (24%) to 2019 (37%) in this region. Cardiovascular diseases are the most common causes of NCDs related mortality, accounting for approximately 13% of deaths due to all causes and 37% of NCDs deaths in Africa. There were around 1.1 million new cases of cancer and 700,000 deaths in Africa in the year 2020. In 2020, Africa accounts for 5.7% of global cancer incidence but has a larger share of deaths, at more than 7%. In the next two decades, cancer death

rates in Africa are expected to exceed the global average by 30%. The most common cancers in adults include breast (16.5%) and cervical (13.1%). There were 24 million people with diabetes in 2021.

Eastern Mediterranean Region

There is an alarmingly high burden of NCDs in the Eastern Mediterranean Region. 79% of all deaths in Middle East and North African Region were attributed to non-communicable diseases in the year 2019. The mortality rates due to NCDs ranged from 75% to 89% in 13 of the 22 countries in this region. Cardiovascular diseases account for the death of more than 1.7 million people annually, followed by cancer, chronic respiratory diseases and diabetes and this is expected to further increase to 2.4 million deaths by the year 2025 unless specific and prompt strategic interventions are implemented.

Risk Factors for Non-Communicable Diseases

Risk factor with respect to NCDs is defined as “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.”

Non-Modifiable Risk Factors

These factors include age, gender, ethnicity, race, genetic predisposition etc. As these factors cannot be modified and are not under the control of human beings and hence, they are considered as non-modifiable risk factors.

Increasing age is an important risk factor for NCDs, however the recent trend shows that the younger population are also increasingly being affected by these conditions. Estrogen acts as a protective shield against NCDs for women during reproductive age groups. On attaining menopause, the risk for developing NCDs becomes equal among both the genders. NCDs among parents pose significant risk among their progenies. There are racial and ethnic differences in the risk of developing NCDs.

Modifiable Risk Factors

These are also considered to be preventable risk factors.

1. **Physical inactivity:** Physical inactivity is one of the major contributors to the occurrence of non-communicable diseases. People with sedentary lifestyles having insufficient physical activity have increased risk of mortality due to any causes compared to those who involve themselves in at least 30 minutes of moderate-intensity physical activity for at least 5 days in a week. Physical activity also has a positive impact on mental health, quality of life and well-being. It is estimated that annually around 830,000 deaths can be attributed to insufficient physical activity.
2. **Salt/sodium intake:** Consumption of food with high salt content contributes to increase in blood pressure and raises the risk of stroke and cardiovascular diseases. In order to reduce the risk of developing these conditions it is recommended to restrict the daily intake of sodium to less than 2gms or salt to less than 5gms. Around 1.8 million deaths annually have been attributed to excess salt/sodium intake.
3. **Tobacco use:** Tobacco use in the form of smoking and smokeless (chewing) are the leading risk factors for morbidity and mortality associated with NCDs across the world. Even passive and second-hand exposure to tobacco smoke has poor health outcomes among non-smokers. It is estimated that more than 8 million deaths annually are attributable to tobacco use (both active and passive exposure to tobacco smoke).

4. Harmful use of alcohol: Harmful use of alcohol is one of the major risk factors for premature mortality and disabilities in the world. Chronic alcohol consumption is associated with occurrence of heart diseases, stroke, cancers, liver diseases and a range of mental and behavioral health issues. It is estimated that annually more than 3 million NCDs related deaths are attributed to harmful use of alcohol.

Metabolic Risk Factors

1. Raised Blood Pressure: Raised blood pressure or hypertension is one of the major risk factors for a variety of non-communicable diseases like coronary heart disease, stroke, chronic kidney disease etc. Uncontrolled hypertension leads to complications like heart failure, stroke, chronic kidney disease-kidney failure, retinal hemorrhage, visual impairment and dementia.
2. Diabetes Mellitus: Diabetes Mellitus is chronic metabolic disorder associated with either lack of production (type 1 diabetes) or effective utilization of insulin (type 2 diabetes). Uncontrolled diabetes leads to complications like coronary heart disease, stroke, peripheral neuropathy, blindness and renal failure. Unhealthy dietary practices, sedentary lifestyle and stress are associated with increased risk of developing diabetes mellitus.
3. Obesity: Overweight and obesity are the major risk factors for hypertension, diabetes, coronary heart diseases, stroke and cancers. Consumption of energy, dense foods, rich in fats and sugars, sedentary lifestyle, lack of physical activity are associated with overweight and obesity.

Environmental Risk Factors

According to the World Health Organization, environmental risk factors are defined as, "all the external physical, chemical, biological, and work-related factors that affect a person's health". These factors include air pollution, radiation, noise, land use patterns, work environment, and climate change. Exposure to these factors in earlier stages of life is associated with increased risk of NCDs throughout the life. It is estimated that 23% of all the deaths are attributed to environmental risk factors and about two-third of these deaths are due to non-communicable diseases.

Air pollution (both indoor and outdoor) is the main environmental risk factor for development of NCDs. Almost 85% of 7 million deaths caused by air pollution are attributed to non-communicable diseases like coronary heart disease, stroke, chronic obstructive pulmonary diseases, asthma and cancers.

Climate change is another significant environmental risk factor for health. Impacts of climate change such as heat waves, extreme weather events, forest fires, food and water insecurity are expected to trigger and exacerbate the onset and progression of NCDs.

Prevention and Control of Non-Communicable Diseases

Primordial Prevention

The strategies under primordial prevention include the prevention of occurrence/exposure to risk factors for non-communicable diseases. Health promotion initiatives from childhood like prevention of smoking and alcohol use, encouraging the children and youth to get involved in physical activity, healthy eating practices and education about developing good habits and personality are some of the steps for preventing NCDs.

Primary Prevention

These are the preventive measures directed towards individuals who are exposed to the risk factors and have not yet developed the NCDs. The interventions include the following components.

- Consuming healthy diet by avoiding excessive salt, sugar, spices, high carbohydrates and trans fats etc. Consuming foods with high dietary fibers, antioxidants, healthy proteins are recommended.
- Regular physical exercise like walking, running, cycling, swimming, etc.
- Adequate sleep and mental relaxation through meditation and yoga to avoid stress.
- Avoiding chewing and smoking of tobacco.
- Protection against cancers through vaccinations like cervical cancer vaccine (HPV), hepatitis B vaccination etc.
- Tracking of blood pressure, blood glucose levels, regular screening procedures for cancers among individuals at risk of development of NCDs.

Secondary Prevention

These are the strategies directed towards early detection and prompt treatment of individuals who are at risk of developing NCDs or have already developed the conditions.

- Early detection of diabetes, hypertension, lipid disorders & obesity and appropriate treatment, through population-based screening and risk stratification.
- Cessation of smoking, avoiding harmful consumption of alcohol.
- Consumption of healthy diet, with low salt, low carbohydrates, unsaturated fats and dietary fibers etc.
- Promotion of healthy lifestyle through physical exercise, yoga, meditation.
- Effective treatment of the patients through pharmacological interventions and ensuring that they adhere to the treatment.
- Regular follow-ups for monitoring and early detection of complications and their effective management.

Tertiary Prevention

These are measures taken on the individuals who have already developed one or more complications of NCDs to prevent the further progression of complications to disabilities. Preventive measures should also be taken by the patients who have already developed disabilities like diabetic foot, retinopathy and stroke etc. Palliative care for cancer patients at terminal stages of illness aims to alleviate the suffering and relieve the symptoms.

Strategies should be adapted for prevention and control of NCDs by countries to reduce their impacts.

At Global Level

- Sensitize the leadership across countries on the burden and impact of NCDs and facilitate designing policies and programs to comprehensively prevent and control these conditions.

- Enhance international commitment towards achievement of targets under Sustainable Development Goal-3 (Good Health and Well-being) through advocacy, dialogues and deliberations across the nations to arrive at consensus.
- Share the knowledge and best practices on prevention and control of NCDs on international platforms.
- Facilitate research and innovations in screening, diagnosis, treatment, prevention and control of risk factors leading to NCDs.
- Monitor the progress of countries towards NCDs prevention and control and provide them the supportive supervision to facilitate the progress.
- Provide financial, technical and infrastructural support to the LDCs and developing nations in designing and implementing NCDs related programs and policies.
- Developing grassroots level human resource for health education, early detection and providing basic care on NCDs at community level.
- Ensure effective utilization and implementation of NCD services offered by government and non-governmental organizations at community level.

Conclusion

Non-communicable diseases are the major public health problems in the world. Prolonged life expectancy, changing lifestyles, rapid urbanization, stressful working environments, air pollution etc. are the major contributing factors for the increased burden of NCDs. As these diseases have multifactorial causation with complex interaction of various risk factors, the prevention and control measures should be multidimensional and multisectoral. Though the international agencies and the national governments across all the WHO regions are making conscious efforts to manage, prevent and control these diseases, there is need for further sustaining these efforts. In order to achieve the targets of Sustainable Development Goal -3 (Good health & Well-being), the world has to gear up the interventions and bring out notable reduction in the morbidity and mortality associated with NCDs through more focused efforts.

Suggested Reading

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National Level

- Design national health policies and programs for prevention and control of NCDs. The programs should comprehensively cover preventive, promotive, curative and rehabilitative aspects of NCDs.
- Allocate higher proportion of GDP on health so that NCDs get a better focus in similar lines with maternal and child health problems and communicable diseases.
- Develop the health care infrastructure at primary, secondary and tertiary care levels to cater to the needs of people affected by NCDs.
- Promote research and innovations in the areas of prevention, management and control of NCDs.
- Establish public private partnership by involving non-governmental organizations and voluntary health agencies with reputed track records in the areas of NCDs.
- Develop comprehensive and continuous quality assurance measures at all levels of health care to ensure continuum of care for people with NCDs.
- Country level policy interventions such as air quality regulations provide an alternative to traditional biomedical treatments so that they can address multiple NCDs at the same time.

Community Level

- Advocacy on the risk factors, diagnosis, management and prevention of NCDs among community stakeholders.
- Community mobilization to adapt healthy lifestyles through health promotion measures and ensure adequate participation in health awareness, screening and treatment initiatives.
- Information, education, communication and behavior change support strategies to the communities on preventive and curative aspects of NCDs.