

## Chronic Non-communicable Diseases: Risk Factors, Disease Burden, Mortalities and Control

**Ravi Kant Upadhyay\***

*Department of Zoology, Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur, India*

**\*Corresponding Author:** Ravi Kant Upadhyay, Department of Zoology, Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur, India.

**DOI:** 10.31080/ASMS.2022.06.1227

**Received:** February 04, 2022

**Published:** March 28, 2022

© All rights are reserved by **Ravi Kant Upadhyay**.

### Abstract

Present review article described major NCDs, its causes, symptoms, complications, medication and prevention. This article explains major non communicable disease and complications of various CVDs i.e. strokes, arterial diseases, stress, alcoholism, narcotics, hypertension, cancer and blood pressure and other life style diseases. NCDs do clinical, mental, physical impairments in users, and these become either permanent or temporary. But most of them impose residual disability/chronic impairment and non reversible, non measurable pathological alterations. This article filters out important causes of NCDs like imbalances in diet structure, living facility, social awareness, cleanliness, and hospital care and medicine availability. There is a rising trend of alcoholic, narcotics and drug abuse in school going young population. Dietary patterns and physical disabilities are not normal and people are coming under extravagant consumerism. Today NCDs are major killer of people and there is an urgent need to make long term plan to aware, counsel and provide regular treatment to the sufferers. For quick action social, community, clinical-legal and treatment methods must include in planning and implement them across the world.

**Keywords:** Non-communicable Diseases; CVDs; Hypertension; Stroke; High Blood Pressure Alcoholism; Smoking and Drug Abuse

### Introduction

Chronic non-communicable diseases (NCDs) are long term deterioration and impairment of health due to multiple non pathogenic causative factors. These are major killers of people and need urgent actions across the world. Non-communicable diseases account for nearly 70% of deaths worldwide, with an estimated 75% of these deaths occurring in low- and middle-income countries [1]. Global burden NCDs is caused due to diabetes, cardiovascular diseases, cancer, and chronic lung diseases [2]. According to the World Health Organization (WHO), in year 2016, around 18.0 million were died only due to victims of CVD, this was accounting for 31% of all registered premature deaths. Of these, 85% resulted from a heart attack or stroke. These conditions affect equal num-

bers of men and women. The WHO estimates that by 2030, approximately 24 million will die from CVD conditions annually mostly due to stroke and heart disease. Although these conditions remain prevalent in global mortality rates, people can start taking steps to prevent them. Most of these chronic diseases have marked risk factors but most of them are related to conditions such as ageing, environmental and diet structure and nutritional and human behavior.

On one side there is a world class living with all maximum life standards while other side is completely gripped under poverty, low education, imbalanced dietary structures and poor quality of living standards. Among other natural reasons are related to water quality, housing and environment. There are imbalances in diet structure, living facility, cleanliness, and hospital care and medicine

availability [3]. There is a need to improve diet quality and food supply at global level under the umbrella of WHO [4]. However, to reduce the risks and disease burden of prevailing NCDs will need huge economic inputs both at global and regional level [3]. It can be maintained by market based economic built up, Medicare insurance schemes and cooperative community services and hospital management. For treatment of chronic communicable diseases socio-legal medicines, public awareness and cultural renaissance is essentially required. Contrary to this there is a world of poor full of miseries, and miserable conditions. There is a lack of money that is a major blockade of child education, nutritional care, livelihood and societal development. It is true that both types of life styles generate chronic health issues; the main reason is human habit and behavior. These seems an immense need of implementation of government schemes for food supply, dietary pattern and physical activity to lower down the burden of hypertension, blood pressure and diabetes [5].

Today luxurious life based on both economic/industry/business activities unfortunately imposing important chronic issues are alcoholism, narcotics, sex abuses, drug peddling and work stress, tension and blood pressure in society. In both situations health related risk factors and disease incidence are on rise and its prevention is less comparison to the rate of occurrence and spread. Most of the chronic disease cases are from both high income and low income society. The condition is very worse in American-African population, though Asia and Australia are also in grip of these diseases. These impairments are either permanent or temporary impose residual disability/chronic impairment and non reversible, non measurable pathological alterations. There is a rising trend of alcoholic, narcotics and drug abuse in young population. Condition is more anxious that young age school children, colleges and higher education centers are in grip of all these abuses. Among important factors use of cigarettes, cigar, hukka bars and other forms of smoking, alcohol and drug abusing habit is increasing in teenagers and adolescents day by day [6]. There is an utter failure of community services for solving issues related to stress, smoking, alcoholism, narcotics, hypertension, cancer and blood pressure with poverty stressed low income unmanaged society. These are also responsible for crime in urban suburban and rural areas. There is a need of long term planning and life time treatment approach to prevention and control of non-communicable diseases [7].

### Risk factors

NCDs have multiple risk factors i.e. use of high salted hot fried fast foods, liquor, smoking and narcotics are making young generation disable. Youngsters are coming under high blood pressure fumes, sugar, obesity, stress, hypertension, anxiety and wordlessness. Dietary patterns and physical disabilities are not normal and people are becoming extravagant and victim of consumerism. Besides environmental risk factors such as occupational health hazards, drinking of polluted water, inhalation of air pollutants, agrochemicals, industrial waste and drugs are increasing in urban areas. In urban areas there seems an increasing prevalence of non-communicable diseases i.e. high blood pressure, sugar, fatty liver, bone fracturing and degeneration, cardiovascular, renal, nervous, and mental diseases. It is true that prevalence of NCDs risk factors and disease burden varies in rural and urban areas. The key factors of difference are wages, living conditions, food habit, education and human behavior [8]. For management and prevention of NCDs identification and action on risk factors is essential for increasing disease-free life expectancy in society at global level [9]. To reduce the morbidity and death toll, there is need of launching of awareness programs, approaches and discourses on non-communicable diseases at global level.

### Disease burden

Outcomes of survey reports clearly indicate that at global level burden of non-communicable diseases (NCDs) is increasing in low-income countries [10]. Major reasons of NCDs are climate change, economic unevenness and lack of medical facilities and food habits and life style [11]. The main reasons behind it poverty, unemployment, low life standards, bad social habits, lack of awareness, hospital care and rising levels of environmental pollution, and climate change [12]. NCDs are responsible for high morbidity, mental and physical disability, and fragmentation of family structures, society and culture. These are giving rise secondary problems and all around miseries, hardships and economic loss at global level. Due to changed lifestyle diabetes, cancer, stress and hypertension are major chronic NCDs issues. Psychological health issues, arthritis, chronic bronchitis, asthma, emphysema, and breathlessness and are behavior and age dependent. All these factors are increasing macroeconomic burden of communicable diseases on the society [13] both in low- and middle-income countries [14]. In future it will further increase if proper management of NCDs is not being

done properly [15]. Though, it is very difficult to think about any cure in absence of known agent, multi-factorial causation, long living period and indefinite onset of diseases like CVD, coronary heart diseases, smoking, hypertension, high serum cholesterol, obesity, cancer and blindness. For fast control and reducing rapidly growing NCD burden allocation of human resources and essential medicines and technologies, must be coupled with quality assurance modalities [10].

### Source of information

For writing this comprehensive research review on animal venom toxins/enzymes/proteins, various databases were searched. For collection of relevant information specific terms such as medical subject headings (MeSH) and key text words, such as “chronic non communicable diseases”, “risk factors, disease burden, morbidities, treatment, complications and mortalities”, “published till 2022 were used in MEDLINE. *Most specially* for retrieving all articles pertaining to chronic non communicable diseases electronic bibliographic databases were searched and abstracts of published studies with relevant information on the venom toxins/allergens were collected. Furthermore, additional references were included through searching the references cited by the studies done on the present topic. Relevant terms were used individually and in combination to ensure an extensive literature search. For updating the information about *a subject* and incorporation of recent knowledge, relevant research articles, books, conferences proceedings’ and public health organization survey reports were selected and collated based on the broader objective of the review. This was achieved by searching databases, including SCOPUS, Web of Science, and EMBASE, Pubmed, Swissprot, Google searches” From this common methodology, discoveries and findings were identified and summarized in this final review.

### Major healthcare issues related to CVDs

#### Cardiovascular (CVDs)

Cardiovascular disease (CVD) severely affects the heart or blood vessels mainly arteries, veins, or capillaries throughout the body and around the heart. In coronary heart disease the flow of oxygen-rich blood to the heart muscle is blocked or reduced. Among them atherosclerosis is a major problem as LDL cholesterol is deposited inside the lumen of arteries, it increases the risk of blood clots and oppose the normal blood flow. It also damages arteries run in vari-

ous organs such as the brain, heart, kidneys and eyes. CVD comprises many different types of conditions. Few of them happen all of a sudden while some might develop delayed and lead to other morbidities or diseases. There are various symptoms of CVDs i.e. angina is characterized by a severe chest pain. It occurs due to decreased blood flow into the heart, or an irregular heartbeat or heart rhythm. Similarly, the arrhythmia and congenital heart diseases are which affect the coronary arteries that feed the heart muscles, or a sudden blockage to the heart’s blood flow and oxygen supply. It results in heart attack, heart failure, wherein the heart cannot contract or relax normally. There are other deformities such as dilated cardiomyopathy, a type of heart failure, related to increase in size of heart and cannot pump blood efficiently. Another problem is hypertrophic cardiomyopathy, in which thickening of heart muscle walls create problems to the relaxation of muscle, obstruct blood flow, and develop electrical instability.

Sometimes blood leaks back through the mitral valve of the heart during contractions, and mitral valve prolapsed. A part of the mitral valve bulges into the left atrium of the heart while it contracts; it causes mitral regurgitation and pulmonary stenosis. In pulmonary stenosis narrowing of the pulmonary artery reduces blood flow from the right ventricle (pumping chamber to the lungs) to the pulmonary artery (blood vessel that carries deoxygenated blood to the lungs). In aortic stenosis, narrowing of the heart valve takes place that causes blockage to blood flow leaving the heart. It also associated with arterial fibrillation, an irregular rhythm that can increase the risk of stroke, rheumatic heart disease. This complication of strep throat induces inflammation in the heart that affect the function of heart valves.

Peripheral arterial disease occurs when there’s a blockage in the arteries to the limbs, usually the legs. In peripheral artery disease arteries become narrow that reduces blood flow to the limbs. It initiates cramping of legs pain that becomes more severe during walking. It also causes numbness or weakness in the legs. Few of them are, aneurysm a bulge or enlargement in an artery that can rupture and bleed, atherosclerosis, in which plaque forms along the walls of blood vessels, narrowing them and restricting the flow of oxygen rich blood [16]. In renal artery disease flow of blood to and from the kidneys is obstructed, it can lead to high blood pressure and spasm. In peripheral venous disease, veins that transport blood from the feet and arms back to the heart, get blocked, it results in

swelling of legs and varicose veins, and ischemic stroke. Sometimes venous blood clots break or loose and become dangerous as they move to the pulmonary artery. Buerger's disease is a blood clotting disorders that also causes inflammation, often in the legs, and may result in gangrene. It is possible to manage some health conditions within CVD by making lifestyle changes, but some conditions may be life threatening and require emergency surgery.

Aortic diseases are a group of conditions affecting the aorta. This is the largest blood vessel in the body, which carries blood from the heart to the rest of the body. One of most common aortic diseases is an aortic aneurysm, where the aorta becomes weakened and bulges outwards. This does not display any symptom, but there's a chance it could burst and cause life-threatening bleeding.

CVD is one of the main causes of death and disability in many developed countries. Both CVDs and cancer are responsible for millions of deaths round the globe both in middle and high income countries [17]. However, there are many ways to reduce the risk of developing these conditions. There are also many treatment options available if do they occur.

### Causes of CVDs

Among important causes high blood pressure is the main cause of CVDs. High blood pressure (hypertension) is one of the most important risk factors for CVD. Persistent high blood pressure can put a strain on the walls of the arteries. This can lead to a variety of health problems, some of which can be life threatening. It is therefore vital that people undergo regular screening for high blood pressure. There are deviations in blood pressure either in systolic pressure, it is the pressure in the arteries as the heart contracts and is the top number in mm Hg on a blood pressure reading. Diastolic, which is the lower number, represents the blood pressure when the heart is resting between beats. These are more prevalent in patients [18]. If blood pressure is too high for too long, it can cause serious damage to the blood vessels. This damage can result in a range of complications, some of which can be life threatening. They include heart failure, vision loss, stroke, kidney disease, and other health problems. Smoking and other tobacco use is also a significant risk factor for CVD. The harmful substances in tobacco can damage and narrow your blood vessels. Cholesterol is a fatty substance found in the blood. If its level goes high, it starts depositing in blood vessel lumen, and creates problem to blood flow and increase developing a blood clot.

### Risk factors

Risk factors for CVD include high blood pressure, or hypertension, atherosclerosis or blockages in the arteries, radiation therapy, smoking, poor sleep hygiene, high blood cholesterol, or hyperlipidemia, diabetes, a high fat, high carbohydrate diet physical inactivity, obesity, sleep apnea, excessive alcohol consumption, stress, air pollution, chronic obstructive pulmonary disorder or other forms of reduced lung function. People with one cardiovascular risk factor often have more. For example, obesity is a risk factor for high blood pressure, high blood cholesterol, and type 2 diabetes.

Diabetes also causes harm to the circulatory system and affects human health. If diabetes persists lifelong, it causes blood sugar level high which damages the blood vessels, making them more likely to become narrowed. Many people with Type 2 diabetes become overweight or obese, which is also a risk factor for CVD. Due to changing food habits and living pattern new risk factors are emerging new NCDs which making situation worst. These changing patterns of cardiovascular diseases and their risk factors are increasing disease burden, both at regional global level [19]. In US 29% of the population, is in grip of high blood pressure (CDC).

Among other important causes of CVDs is physical inactivity that makes body obese and heavy weight body mass index above 25 might have frisk of CVDs. Both these conditions initiate diabetes and high blood pressure. Genetic factors are also strong reasons of CVDs, If someone has family history of CVD, he or she will remain under the risk of developing CVDs. Ethnic background is also responsible for CVDs [20]. CVD is more common in people of Latin American, European, south Asian and an African or Caribbean background. This is because people from these backgrounds are more likely to have other risk factors for CVD, such as high blood pressure or type 2- diabetes.

### Symptoms

Symptoms will vary depending on the specific condition. However, typical symptoms of an underlying cardiovascular issue include pain or pressure in the chest, which may indicate angina, pain or discomfort in the arms, left shoulder, elbows, jaw, or back, shortness of breath, nausea and fatigue, lightheadedness or dizziness, cold sweats, Although these are the most common ones, CVD can cause symptoms anywhere in the body.

## Diagnosis and prevention

There are certain biomarkers of cardiovascular diseases such as elevated blood pressure, severe diabetes, and obesity, problem in breathing, chest pain and inflammation. Among molecular markers of CVDs are non-coding RNAs [21] and miRNAs [22]. There are certain invasive and noninvasive cardiac-specific biomarkers in obesity and cardiovascular diseases [23]. Inactivity is also an important cause of CVDs. For effective prevention of CVDs a regular exercise for 25 minutes provides relief in blood pressure, high cholesterol levels and cut down overweight. Reduce the body weight by 5-10% lower down risk of CVD. A healthy diet and regular exercise can also help in maintaining a healthy weight. Eating foods that contain polyunsaturated fats and omega 3, such as oily fish, alongside fruits and vegetables can support heart health and reduce the risk of CVD. Reducing the intake of processed food, salt, saturated fat, and added sugar has a similar effect. Reducing the use of alcohol, tobacco, and smoking are key risk factors for almost all forms of CVD. Although quitting can be difficult, taking steps to do so can drastically reduce its damaging effects on the heart.

## Medication

Medications that may be recommended include statins to lower blood cholesterol levels, low-dose aspirin to prevent blood clots, and tablets to reduce blood pressure. Anyone taking a daily dose of aspirin to reduce their risk of CVD should ask their doctor whether or not they should continue. However, some options include: medication, such as to reduce low density lipoprotein cholesterol, improve blood flow, or regulate heart rhythm, surgery, such as coronary artery bypass grafting or valve repair or replacement surgery, cardiac rehabilitation, including exercise prescriptions and lifestyle counseling, relieve symptoms, reduce the risk of the condition or disease recurring or getting worse, prevent complications, such as hospital admission, heart failure, stroke, heart attack, or death. Depending on the condition, a healthcare provider may also seek to stabilize heart rhythms, reduce blockages, and relax the arteries to enable a better flow of blood.

## Strokes

A stroke is a medical emergency in which blood supply to part of the brain is suddenly cut off. This interruption in blood supply prevents brain tissue from getting oxygen and nutrients. A stroke occurs when a blood vessel in the brain ruptures and bleeds, or when

there's a blockage in the blood supply to the brain. The rupture or blockage prevents blood and oxygen from reaching the brain's tissues. Without oxygen, brain cells and tissue get damaged and begin to die within minutes. A stroke is a medical emergency, and prompt treatment is crucial, if timely treatment is not provided death is possible.

There are three main types of stroke i.e. ischemic strokes, hemorrhagic stroke and transient ischemic strokes. Most strokes (87%) are ischemic strokes. An ischemic stroke happens when blood flow through the artery that supplies oxygen-rich blood to the brain becomes blocked. Blood clots often cause the blockages that lead to ischemic strokes [24]. **Transient ischemic attack (TIA)** involves a blood clot that typically reverses on its own. A transient ischemic attack (also called a TIA or «mini-stroke») is similar, but the blood flow to the brain is only temporarily disrupted. Early treatment with medication like tPA (clot buster) can minimize brain damage. Other treatments focus on limiting complications and preventing additional strokes. Most of deaths noted in United States are caused by stroke (CDC).

Hemorrhagic stroke is caused by either a burst or leaking blood vessel that seeps into the brain. A hemorrhagic stroke happens when an artery in the brain leaks blood or ruptures (breaks open). The leaked blood puts too much pressure on brain cells, which damages them. High blood pressure and aneurysms—balloon-like bulges in an artery that can stretch and burst—are examples of conditions that can cause a hemorrhagic stroke. There are two types of hemorrhagic strokes: Intracerebral hemorrhage is the most common type of hemorrhagic stroke. It occurs when an artery in the brain bursts, flooding the surrounding tissue with blood. Subarachnoid hemorrhage is a less common type of hemorrhagic stroke. It refers to bleeding in the area between the brain and the thin tissues that cover it.

Among more prominent symptoms of stroke is trouble in walking, speaking and understanding, as well as paralysis or numbness of the face, arm or leg. Ischemic stroke sometimes results in chronic inflammatory airway disease [25,26], imposes long-term risk of myocardial infarction [27] and long time stress in patients [28]. There are certain treatment methods available for stroke treatment such as increase of dietary use of Omega-3 Polyunsaturated Fatty Acids [29] and intake of oral anticoagulants [30].



## Symptoms

The major symptoms of stroke are, paralysis, numbness or weakness in the arm, face, and leg, especially on one side of the body, trouble speaking or understanding others, slurred speech, confusion, disorientation, or lack of responsiveness, sudden behavioral changes, especially increased agitation, vision problems, such as trouble seeing in one or both eyes with vision blackened or blurred, or double vision, trouble walking, loss of balance or coordination, dizziness, severe, sudden headache with an unknown cause, seizures, nausea or vomiting.

## Risk factors

There are so many risk factors which are increasing NCDs associated morbidities and deaths. Heavy alcohol use raises blood pressure levels, it increases the chances of stroke. It also raises triglyceride levels, which can cause atherosclerosis. This is plaque buildup in the arteries that narrows blood vessels. Nicotine found in tobacco also raises the risk of stroke because of raising blood pressure. There are some risk factors for stroke such as family history. Stroke risk is higher in some families because of genetic health factors, such as high blood pressure. Both women and men have similar danger of strokes, they're more common in women than in men in all age groups. An unbalanced diet can increase the risk of stroke. This type of diet is high in: salt, saturated fats, trans fats, cholesterol, inactivity, or lack of exercise, can also raise the risk of stroke. Regular exercise has a number of health benefits. The CDC recommends that adults get at least 2.5 hrs. This can mean simply a brisk walk a few times a week. Every year, more than 795,000 U.S. people have a stroke. Old age is also responsible for stroke. Besides this, race and ethnicity are also responsible for increase in NCDs. Certain medical conditions such as high blood pressure, high cholesterol, excess weight, heart disorders, such as coronary artery disease, heart valve defects, enlarged heart chambers and irregular heartbeats, diabetes, blood clot disorder, are seen more in ethnic groups.

## Diagnosis of stroke

Stroke is diagnosed by examining sugar levels, platelet counts, blood clots and cholesterol levels. An MRI or CT can help to locate whether any brain tissue or brain cells have been damaged. It also clearly display bleeding or damage inside brain. EKG or electrocardiogram records the electrical activity in the heart, measuring

its rhythm and recording how fast it beats. An EKG can determine whether person has normal heart conditions or passing under stroke, such as a prior heart attack or atrial fibrillation. A cerebral angiogram offers a detailed look at the arteries in neck and brain. The test can show blockages or clots that may have caused symptoms. A carotid ultrasound also called a carotid duplex scan, help to recognize fatty deposits (plaque) in carotid arteries, which supply the blood to face, neck, and brain. An increased blood pressure disturbs balance, coordination, weakness, numbness in your arms, face, or legs, signs of confusion, vision issues. In diagnosis of cardiovascular diseases spectrometry imaging is useful.

## Complications

Some of these complications include: seizures, loss of bladder and bowel control, cognitive impairment, including dementia, reduced mobility, range of motion, or ability to control certain muscle movements, depression, mood or emotional changes, shoulder pain, bed sores, sensory or sensation changes. These complications can be managed by methods such as medication, physical therapy and counseling.

## Prevention

Lifestyle changes can't prevent all strokes. People should give up habit of smoking, alcohol and over diet and use of junk food to avoid danger of stroke. Overweight and obesity increases the risk of stroke. To avoid stroke people should eat a balanced diet and stay physically active. Both steps can also reduce blood pressure and cholesterol levels. Routinely checkup for blood pressure, cholesterol, and any conditions and consult your doctor for proper guidance.

## Treatment methods

Thrombolytic drugs are provided to break up blood clots in arteries of brain, these still stop the stroke and reduce damage to the brain. Normally tissue plasminogen activator (tPA), or Alteplase IV r-tPA is prescribed to dissolve blood clots quickly. Surgery is also used to remove a blood clot and plaques from arteries. This surgery may be done with a catheter. If the clot is especially large, a surgeon may open an artery to remove the blockage [31].

The most common anticoagulant or anti-platelet drugs are warfarin, aspirin, and clopidogrel (Coumadin, Jantoven). These drugs

can also prevent existing blood clots from growing larger, and prevent a stroke, mainly TIA. These medications prevent blood clots by making it more difficult for the blood's platelets to stick together. Statins such as rosuvastatin, simvastatin and atorvastatin prevent the production of an enzyme that can turn cholesterol into plaque. Few drugs are prescribed to reduce blood pressure, lower the pressure in your brain, prevent seizures, and prevent blood vessel constriction. More often, there is need of managing high blood pressure with medication, lifestyle changes and interdisciplinary action to cure high risk stroke patients [32].

### Maternal health and child care issues

With the increase in obesity prevalence among women of reproductive age globally, the risks of type 2 diabetes, gestational diabetes, pre-eclampsia, and other conditions are rising, with detrimental effects on maternal and newborn health [33]. It encourages healthcare practitioners to initiate a dialogue on women's health, nutrition, and weight management before conception. The recommendations can be contextualized based on local cultural and dietary practices as part of a system-wide public health approach to influence the wider determinants as well as individual factors influencing preconception health [33]. Early check up is important to stop neonatal cancer, diabetes, chronic respiratory diseases, and cardiovascular diseases.

### Hypertension

High blood pressure (hypertension) is a common condition in which the long-term force of the blood against your artery walls is high enough that it may eventually cause health problems, such as heart disease. Hypertension is a condition in which the force of the blood becomes too high against the artery walls. High blood pressure is a lifestyle disease becomes very severe as it gives rise hypertension that is a major risk factor for CVDs. Usually hypertension is defined as blood pressure above 140/90, and is considered severe if the pressure is above 180/120. High blood pressure often has no symptoms. Over time, if it is not treated it can lead to severe health complications and increase the risk of heart disease, stroke, and sometimes death. Eating a healthier diet with less salt, exercising regularly and taking medication can help lower blood pressure.

There are so many factors which are responsible for blood pressure, but family history is most important as the genetics play important role in its severity. Smoking increases blood pressure,

avoiding of it reduces the chances of hypertension and risk of CVDs and other health issues. Among primary reasons of hypertension are obesity, alcohol intake, high salt intake, smoking and insulin resistance. Among Secondary hypertension causes are diabetics, pheochromocytoma, Cushing syndrome, hyperthyroidism, pregnancy and hyperparathyroidism. Long-term hypertension can cause complications atherosclerosis that give rise heart failure and heart attacks, aneurysm, or an atypical bulge in the wall of an artery that can burst, kidney failure, stroke, amputation, hypertensive retinopathies in the eye, which can lead to blindness.

A number of factors such as CVDs, diabetes, chronic kidney disease, and high cholesterol levels can lead to hypertension, especially as people age. Over consumption of alcohol or tobacco increases blood pressure. Without detection, hypertension can damage the heart, blood vessels, and other organs, such as the kidneys. Hence, it is highly essential to check blood pressure regularly. Hypertension is a metabolic disorder; hence, diet, proper medication regular exercise, sleep and rest are highly important [34]. A hypertension patient should regular check blood pressure for reducing health burden of elevated blood pressure [35]. High blood pressure is responsible for sweating, anxiety, sleeping problems, severe headache and nosebleeds. Both genetics and immune system play important role in hypertension [36,37].

### Treatment and prevention

One should come out of stress as quick as possible is only remedy control of blood pressure. For keeping stress free one should follow meditation, yoga, pranayama, warm baths, long walk and swimming in daily habit. All these are boon for stress reduction. For a calm and peaceful life avoid alcohol and use of narcotic drugs, smoke free person feel freer than a smoker. People who have high blood pressure or people at high risk for developing high blood pressure should reduce their intake of saturated fats in favor of unsaturated forms. They should use eating more fruits and vegetables and less fat or use trans fats mainly poly unsaturated fatty acids (PUFAs). Easy, healthy fibrous diet is more beneficial, it must have whole grain, high fiber foods, a variety of fruits and vegetables pulses, such as chickpeas, beans, and lentils, nuts, vegetable oils, such as olive oil, low fat dairy products.

Clinical medicines are also prescribed for treatment of high blood pressure and hyper tension. A serial long term course of

medicines such as beta and alpha blockers and calcium channel blockers provide quick relief. Few diuretics such as thiazides, indapamide and chlorthalidone are also prescribed. Angiotensin converting enzymes, adrenergic inhibitors and vasodilators are also provided. Both treatment and duration must start under guidance of some clinical expert. The choice of medicine depends on age of individual and status report based on family history.

## Diabetes

Diabetes is a disease state due to lower or high blood sugar level. Blood glucose is the main source of energy that comes from the utilization and absorption of food material. Insulin secreted from pancreas controls glucose level. In a state of low insulin secretion consumption of glucose by body cells is reduced and its extra amount stays in blood. It results in diabetes. There are two forms of diabetes.

### Type 1 diabetes

In Type 1 diabetes body does not synthesize enough amount of insulin. Type 1 diabetes is also an autoimmune disease in which immune system attacks and destroys the cells in pancreas that make insulin. Still it is unclear why immune system attacks pancreatic cells which synthesize insulin. Type 1 diabetes occurs in children and young adults, although it can appear at any age. People with type 1 diabetes need to take insulin every day to stay alive. Type 1 diabetes is seen in 10% of people.

### Type 2 diabetes

In Type 2 diabetes body does not synthesize properly or use insulin well. In Type 2 diabetes body becomes resistant to insulin and sugar builds up in blood. It also happens at any age, even during childhood. Mostly it is reported in middle-aged and older people. Type 2 is the most common type of diabetes.

### Gestational diabetes

This is also a high blood sugar state that appears during pregnancy. Insulin-blocking hormones produced by the placenta cause this type of diabetes. Most of the time, this type of diabetes goes away after the baby is born. But women those having gestational diabetes, may have a greater chance of developing type 2 diabetes later in life. Sometimes diabetes diagnosed during pregnancy is actually type 2 diabetes. A rare condition called diabetes insipidus is

not related to diabetes mellitus, although it has a similar name. It's a different condition in which your kidneys remove too much fluid from your body.

Monogenic diabetes is less common and is an inherited form of diabetes. The bottom line diabetes is starting stage of diabetes; it is very hard to spot at first. It is also known as "touch of sugar" or "borderline diabetes."

## Causes and risk factors

Certain factors increase your risk for diabetes. Normally type 1 diabetes is found in children and teenager. Other factors like physical inactivity, race, and certain health problems such as high blood pressure also affect type 2 diabetes. Different causes are associated with each type of diabetes. For some reason, the immune system mistakenly attacks and destroys insulin-producing beta cells in the pancreas. Certain genes are linked to the disease. Type 2 diabetes increases appeared in overweight persons of more than 45 years age or older. Gestational diabetes is the result of hormonal changes during pregnancy. The placenta produces hormones that make a pregnant woman's cells less sensitive to the effects of insulin. This condition runs in families. Type 2 diabetes occurs due to genetic and lifestyle factors. Obesity and extra body weight increases the risk. Carrying extra weight, and belly stomach makes body cells more resistant to the effects of insulin on blood sugar. Ethnicity is also imposes high risk of diabetes. People from ethnic background African, American, Hispanic or Latino American, Alaska Native, Pacific Islander, American Indian, or Asian American ancestry are more susceptible to high blood pressure, high cholesterol or high triglycerides.

## Diabetes complications

Diabetes imposes severe effects if remain untreated, high blood sugar level is harmful for nerves, eyes, kidneys, and other organs. Over time, high blood glucose leads to problems such as heart disease, stroke, kidney disease, eye problems, dental disease, nerve damage, foot problems Diabetes symptoms are caused by rising blood sugar. Diabetic person displays symptoms of increased hunger, increased thirst, weight loss, tiredness, frequent urination, blurry vision, extreme fatigue, sores, decreased sex drive, erectile dysfunction and poor muscle strength. Diabetic women become prone to urinary tract infection, their skin get dry and become itchy. It may also cause recurring infections. This is because ele-



vated glucose levels make it harder for the body to heal. High blood sugar damages organs and tissues throughout body. Diabetic person become prone to heart attack, stroke, neuropathy, and face eye sight problems, hearing loss, bacterial and fungal infection. Uncontrolled gestational diabetes can lead to problems that affect both the mother and baby. Diabetes can lead to serious medical complications, but it can be managed by using appropriate medications and lifestyle changes.

### Treatment of diabetes

Diabetic person should avoid carbohydrates in food for example use of rice, sugar and sweet dishes. It increases blood sugar level rises. Take fibrous food materials and take regular insulin doses according to doctors advice. Getting the right balance of protein, fat, and carbohydrates can help you control your blood sugar. Diet and exercise can help some people manage Type 2 diabetes. If lifestyle changes aren't enough to lower your blood sugar, you'll need to take medication. Eating the right types of foods can both control your blood sugar and help you lose any excess weight. Few important drugs such as statins are prescribed in nephrogenic diabetes insipidus [38]. Thyroid dysfunction is also related to Type 2 Diabetes Mellitus. It is also related to CVDs and has severe clinical manifestations [39,40]. Sulfonylurea is used as glucose-lowering agents [41]. Monogenic diabetes is due to single gene defects that primarily affect beta cell function with more than 30 different genes reported. Children with antibody-negative, C-peptide-positive diabetes should be evaluated and genetically tested for monogenic diabetes.

### Alcoholism

Alcohol use disorder (sometimes called alcoholism) is a medical condition. Alcoholism severely affects neural functions and behavior both in males and females [42]. It is an antisocial act, carry youngsters in deep depression, anxiety [43] and influences genetics of users [44]. It imparts slow but cumulative long term effects in user which appear in form of distress or chronic disease. An uncontrolled drinking is highly harmful for vital organs. In users alcohol imposes inability to control drinking due to both a physical and emotional dependence on alcohol.

Alcoholism or alcohol dependence or use disorder change habit and mood and person always remain in grip to have strong need to drink. In a state of un-drink alcohol addiction make person more

anxious and irritable. As soon as the effect of alcohol wearing off person show withdrawal and face problem in sleeping, shakiness, irritability, anxiety, depression, nausea, restlessness and sweating. Binge or heavy drinking is highly dangerous, it increases the risk of certain cancers i.e. breast, liver, colon and mouth. It also evokes fatty liver disease and cirrhosis. It can also cause damage to the brain and other organs. Drinking during pregnancy is harmful for developing embryo. Alcohol also increases the risk of dementia, despair, depression, coma, seizures and suicide. In heavy drinking stage heavy car crashes, injuries, homicide, and suicide have been seen.

Symptoms include repeated alcohol consumption despite related legal and health issues. Those with alcoholism may begin each day with a drink, feel guilty about their drinking and have the desire to cut down on the amount of drinking. No single lab test is available for alcohol use disorder but it is identified by smell and person's conversation behavior. It's a disease of brain function and requires medical and psychological treatments to control it. Treatment involves counseling by a healthcare professional. A combination of medications, behavioral therapy and support can help to recover. Various treatment methods such as behavioral therapies including counseling, or talk therapy, with a psychologist or mental health counselor can instruct and change behavior the alcoholic person. Topiramate and gabapentin can also decrease cravings in some people. An older medication disulfiram is rarely used today. These medications seem to help decrease the background obsessional thinking around alcohol. In addition, affected person needs inpatient medical (hospital), residential rehabilitation, outpatient intensive therapy or outpatient maintenance to restore the neuro-psychological behaviour [45]. Family history of alcoholism helps to alleviate the associated problems, and remedial solutions family. There is a need to know the factors, condition, mental situation and behavior of person to relieve stress, restore epigenetics, and lower down the use of alcohol [46].

### Narcotics or drug abuses

The term narcotic originally referred medically to any psychoactive compound with numbing or paralyzing properties. Narcotics are now called opioids mainly morphine, codeine, and heroin, but are not made from opium. They bind to opioid receptors in the central nervous system. These are derivatives of many of the compounds found within raw opium latex. Narcotics are a

class of drugs that are used to treat moderate to severe pain, as well as severe acute pain. There are many types of narcotic pain medications. Some of the more common narcotic pain medications include: Codeine, Morphine, Oxycodone (OxyContin) Methadone, Opium, Heroin, Tramadol, Hydromorphone, Fentanyl, Carfentanil. The naturally occurring opiates (plant alkaloids derived from the opium poppy) as well as synthetic (man-made) and semi synthetic opioids are considered to be narcotic drugs, which include both legally prescribed and illicit varieties. Opioids not only diminish the perception of pain signaling in the central nervous system but also produce rewarding, euphoric effects, making them targets for abuse and highly addictive.

Narcotics, also known as opiates and opioid analgesics, Narcotics are usually prescribed to alleviate intense, short-term pain as in the case when someone has a medical condition (cancer) or when someone is recovering from a surgery. The narcotics bind to nerve receptors located in the brain in order to block and reduce pain. Codeine is typically prescribed when someone experiences mild to moderate pain. A doctor may prescribe something stronger when pain intensifies, like morphine or fentanyl.

### Effects

The consequences of illicit drug use are widespread, causing permanent physical and emotional damage to users and negatively impacting their families, coworkers, and many others with whom they have contact. Drug use negatively impacts a user's health, often leading to sickness and disease. They are widely overused and are associated with over two million cases of substance abuse that have resulted in overdoses. Narcotic, impose intense side effects on users. Some common side effects of narcotics are dizziness, drowsiness, constipation, dry mouth, headaches, Nausea, Itching (usually mild), Severe narcotic side effects include cardiac arrest, trouble breathing, and chest pain. These drugs bind to 5-HT<sub>3</sub> receptor modulates physical dependence on opioid narcotics [47]. These make the person psychotic, moody and addictive and impose bowel syndrome [48]. There is a growing opioid epidemic that is also responsible for increase in Hepatitis.

### Prevention

Control on drug abuse was decided in 1961 convention that is governed by 1972 protocol. This convention establishes strict controls on the cultivation of opium poppy, coca bush, cannabis plant

and their products. This convention, suggested complete ban on 136 narcotic drugs (although cocaine is a stimulant drug rather than one that induces sleep) including natural products, such as opium and its derivatives, morphine, codeine and heroin. It also provide ban on synthetic drugs, such as methadone and pethidine, as well as cannabis and coca leaf. Parties to the 1961 Convention undertake to limit the production, manufacture, export, import, distribution and stocks of, trade in and use and possession of the controlled drugs so that they are used exclusively for medical and scientific purposes.).

### The impact of drugs on society

According to NSDUH data over 3.5 million individuals aged 18 and older admitted to having injected an illicit drug during their lifetime in 2004. Of these individuals, 14 percent (498,000) were under the age of 25. Similarly, 123,235 adults living with AIDS were noted in the United States in 2003. This was spread due to use of injection for taking drug. These show least survival rate. CDC further reports that more than 25,000 people died in 2003 from drug-induced effects.

Drug abuse severely affects every section of society. The drug abuse imposes negative consequences not only individuals but largely effect their families and friends. Children of individuals who abuse drugs often are abused or neglected as a result of the individuals' preoccupation with drugs. Children whose parents and other family members abuse drugs often are physically or emotionally abused and often lack proper immunizations, medical care, dental care, and necessities such as food, water, and shelter. The risk to children is even greater when their parents or guardians manufacture illicit drugs such as methamphetamine. Methamphetamine abusers often produce the drug in their own homes and apartments, using hazardous chemicals such as hydriodic acid, iodine, and anhydrous ammonia. Children who inhabit such homes often inhale dangerous chemical fumes and gases or ingest toxic chemicals or illicit drugs. These children commonly test positive for methamphetamine and suffer from both short- and long-term health consequences. Moreover, because many methamphetamine producers also abuse the drug, children commonly suffer from neglect that leads to psychological and developmental problems.

The economic impact of drug abuse on businesses whose employees abuse drugs can be significant. The economic consequences

es of drug abuse severely burden federal, state, and local government resources and, ultimately, the taxpayer. Drug users jeopardize the safety of citizens and adversely affect the environment. Drug abusers are catastrophic to airline pilots, air traffic controllers, train operators, and bus drivers are just a few examples. Drug abuse imposes, absenteeism, lost productivity, and increased use of medical and insurance benefits by employees who abuse drugs affect a business financially.

People with addiction often have one or more associated health issues, which could include lung or heart disease, stroke, cancer, or mental health conditions. For example, it is now well-known that tobacco smoke can cause many cancers, methamphetamine can cause severe dental problems, known as meth mouth, and that opioids can lead to overdose and death. In addition, some drugs, such as inhalants, may damage or destroy nerve cells, either in the brain or the peripheral nervous system (the nervous system outside the brain and spinal cord). Drug use can also increase the risk of contracting infections both for HIV and hepatitis C (a serious liver disease). These people share injection syringes and needles that is a very unsafe practice. It also generates skin infection (cellulitis) after exposure to bacteria by injection drug use. Drug use and other mental illness often co-exist. In some cases, mental disorders such as anxiety, depression, or schizophrenia may come before addiction. In other cases, drug use may trigger or worsen those mental health conditions, particularly in people with specific vulnerabilities [49].

Narcotic drugs impose anxiety or depression and psychiatric mental disorder in the long run, as well as increase the risk of developing addiction. Narcotics severely affect pregnant or breastfeeding mothers. Some drug-exposed children will have developmental problems with behavior, attention, and thinking. Secondhand tobacco smoke exposes bystanders to at least 250 chemicals that are known to be harmful, particularly to children. Involuntary exposure to secondhand smoke increases the risks of heart disease and lung cancer in people who have never smoked. Injection of drugs accounts for 1 in 10 of cases of HIV. Injection drug use is also a major factor in the spread of hepatitis C, endocarditis and cellulitis [50]. Use of illicit drugs or misuse of prescription drugs or drinking alcohol is responsible for car accidents driving after drinking alcohol. Drugged driving puts the driver, passengers, and others who share the road at risk. After alcohol, marijuana is the drug

most often linked to impair driving. Major negative effects noted in marijuana drivers are faulty lane weaving, poor reaction time, and altered attention to the road. Imaging scans, chest X-rays, and blood tests can show the damaging effects of long-term drug use throughout the body.

### Smoking

Social smoking is crime on non smokers; it is quite distinct from individual smoking because a lonely smoker feels shy and keeps hiding himself. Both types of smoking are evils in society. From adults children also start participating to seek some enjoy. But it is highly harmful for teenage groups. Smoking shows cumulative long term effects and is directly responsible for lung cancer (National Cancer Institute). There are intermittent smokers which use smoking one time a day or limited time in a weak, but it is very rare. Passive smoking of cannabis is highly harmful. The most commonly-used definition characterizes as social smokers those who smoke predominantly when others are present. So, for example, young adult smokers, such as college students, are often characterized as social smokers, because many (27–70%) of them say they most often smoke with others about 19% smoke only with others.

### Control and prevention of NCDs

Non-communicable diseases (NCDs) cause a large burden of disease globally. Some infectious diseases cause an increased risk of developing specific NCDs [51]. Control and prevention of NCDs is a very challenging task because society is changing very fast and moral values are decreasing in youngsters. The condition is more alarming as teenage groups are under grip of alcoholism, smoking and narcotics with changing habits and their likeliness for high slated fast foods. Condition is more vulnerable in low economic African and south east Asian countries. Though situation in Latin American and European countries is also severe but it is under managerial limits because healths care medication and functioning of counseling centers. For a achieving an early success and for a quick action on NCDs change in human behavior and habit through awareness, counseling, social and community medicines may provide good results. Further, change in lifestyle can cut down the disease burden of NCDs like CVDs, mainly stroke, high blood pressure, stress, strain, diabetes, cancer and AIDs. Integrated management of HIV/NCDs: knowledge, attitudes, and practices of health care workers Incidence of non-communicable diseases (NCDs) in HIV patients on ART in a developing country [52].

Modification of known risk factors will reduce the burden non-communicable diseases (NCDs). Though there are cumulative numbers of NCD risk factors exhibited by an individual which are responsible for disease burden [53]. Demographically, the more number of cases are reported from rural areas in comparison to the urban areas. This significant rise in rural areas is poverty, lack of proper education, unemployment and awareness. These situations can be managed by forming Village Health Teams (VHTs) which can focus on infectious diseases and maternal-child health. These must include skilled clinicians and technicians so that an early diagnosis, treatment and counseling become possible. It will reduce the growing burden of non-communicable diseases (NCDs) [54]. Though, endogenous factors are associated with, but exogenous factors such as region, residence status, land tenure system and behavioral characteristics have significant causal effects on the cumulative NCD risk factors [53].

In reducing the risk factors and disease burden long term plans based on survey, reporting, hospital care medication and regular counseling will play important role. Huge funds are required to develop hospitals and clinical centers to purchase essential equipment and medications for diverse NCDs at first-referral level hospitals. Further, there is a need for decentralization and integration of NCDI services in existing care platforms and improved assessment and monitoring to fully achieve universal health coverage through Govt aids and insurance companies [55]. Medication and equipment availability can solve issues related to high blood pressure, hypertension acute, epilepsy, type 1 and type 2- diabetes and asthma. Modern diagnosing tools equipments and medications are needed in hospitals to cure patients heart failure, rheumatic heart disease, hypertensive emergencies or acute minor surgical conditions. For coordination of various hospitals the monitoring framework must be established for evaluating health system response to noncommunicable diseases (NCDs). This might include all indicators to assess availability of affordable basic technologies and essential medicines required by both public and private primary care centers [56]. Both private and public primary care facilities and public secondary facilities are currently not adequately prepared to comprehensively address the burden of NCDs in India [56]. For better management collected data on human resources, equipment, NCD screening and management, medicines, and laboratory tests [56]. To reduce the disease burden of NCDs in low incoming

countries heavy investment be needed to equip the hospitals to focus largely on survey, diagnosis and treatment of communicable diseases. These low income countries have epidemiologic, demographic, and nutritional transitions.

Further, to control age related NCDs schooling counseling, treatment and socialization are important methods. For quick control WHO must limit the production, manufacture, export, import, distribution and stocks of, trade in and use and possession of the controlled drugs. With this production of natural narcotics must be fully banned. It will certainly cut down infection-attributable NCD burden in many sub-Saharan African countries [57] where several common risk factors of NCDs (tobacco, alcohol use, high systolic blood pressure, dietary risks, high fasting plasma glucose, air pollution, and high LDL cholesterol) are enforcing people.

To tackle with NCDs development of multisectoral action plans are important for identification of common challenges. These will help in applying and opting best clinical practices, share their experiences [58] about family history, risk factors, disease burden due to obesity, high BP, CVDs and diabetes. These plans must have surveys on expenditure on food, clothing, hygiene, and energy. These will help in mitigation of nutrient deficiency diseases and need for consumption of different food Law enforcement is also an important tool that can give a direction and judicial framework to reduce the NCDs under social evils. There is requirement of international agreements, national and sub national legislation, regulations and other executive instruments, and decisions of courts and tribunals [59]. World Health Organization and its partners could take to mobilize the legal workforce, strengthen legal capacity and support effective use of law at the national level. Legal and regulatory actions must move to the centre of national non-communicable disease action plans. This requires high-level leadership from global and national leaders, enacting evidence-based legislation and building legal capacities [59]. Hence, law can applied as a tool for implementing policies for prevention and control of leading risk factors [59]. It will also help in identification of key areas of intersection between law and non-communicable diseases.

Type of disease	Causes	Symptoms	Morbidity	Treatment	Disease burden
Cardiovascular diseases					
Coronary heart diseases	Cigarette smoking, high BP, elevated serum cholesterol, diabetes, obesity, sedentary habit and stress, High LDL cholesterol	Inadequate blood flow, impairment of heart function	124-283 per 1,00,000 population	Changing life style, daily exercise, dietary habit, medicines	Macroeconomic Non reversible, high risk
Dilated cardiomyopathy	Problem in heart's main pumping chamber (left ventricle). The ventricle stretches and thins (dilates) and can't pump blood as well as a healthy heart can. Diabetes, obesity, High blood pressure, Heart rhythm problems	Do not display symptoms, Shortness of breath, chest pain, and lead to irregular heartbeats (arrhythmias), blood clots or sudden death	5.9 per 100,000 global population	Changing life style, daily exercise, dietary habit, medicines	Macroeconomic Non reversible, high risk. It is life-threatening. It's a common cause of heart failure.
Hypertrophic cardiomyopathy	Heart muscle becomes abnormally thick, The thickened heart muscle can make it harder for the heart to pump blood	Chest pain, Shortness of breath and fatigue, fainting or passing out, abnormal heart rhythms, atrial fibrillation	One in 500 global population	Septal myectomy	Macroeconomic Reversible, high risk, Cardiac arrest, ventricular tachycardia
Mitral regurgitation and pulmonary stenosis	A narrowed mitral valve interferes with blood flow, rheumatic fever, calcium deposits, congenital defect	Fluid in the lungs (pulmonary edema), shortness of breath, heart murmur	10-year survival is less than 15%	Removal of blood clots, surgery for valve replacement or valvuloplasty	Macroeconomic reversible
Stroke	Blood supply to part of the brain is interrupted, obesity, physical inactivity, binge drinking, drugs such as cocaine, high BP, high cholesterol, diabetes and age	Trouble in speaking and understanding, paralysis, eyesight, headache, stumble or lose of balance	about 185,000 strokes—nearly 1 of 4	Anti-platelet drugs, anticoagulants and blood-thinning medications	Macroeconomic Non reversible or reversible, high risk
Heart failure	Heart doesn't pump enough blood for body's needs, coronary artery disease, high blood pressure, diabetes and obesity.	Shortness of breath, fatigue and weakness, swelling in the legs, ankles and feet	13.4% of total affected patients	Losing weight, exercising, reducing salt (sodium) in your diet and managing stress	Macroeconomic, Non reversible, high risk



Heart attack	Blood clot in artery blocks blood flow to the heart.	Tightness or pain in the chest, neck, back or arms, as well as fatigue, lightheadedness, abnormal heartbeat and anxiety	17.9 million lives each year at global level	causing a heart attack.	Macroeconomic, Non reversible, high risk
Atherosclerosis	Chronic inflammatory disease of the arteries	has no symptoms	More than 400,000 deaths annually	Surgery to open blocked, arteries, healthy diet and exercise can help. medication,	Macroeconomic reversible, high risk
Diabetes					
Type 1 diabetes	A chronic condition in which the pancreas produces little or no insulin	Increased thirst, frequent urination, hunger, fatigue and blurred vision.	More than 1 million cases per year (India)	Maintain normal blood sugar levels through regular monitoring, insulin therapy, diet and exercise.	Macroeconomic, reversible, high risk
Type 2 diabetes	A chronic condition that affects the way the body processes blood sugar (glucose).	Increased thirst, frequent urination, hunger, fatigue and blurred vision	More than 10 million cases per year (India)	Diet, exercise, medication and insulin therapy.	Macroeconomic, reversible, high risk
Borderline diabetes or touch sugar	Condition where blood sugar levels are higher than normal but not yet high enough for a diagnosis	Obesity, especially abdominal obesity, high blood pressure, high blood fat levels, or triglycerides	estimated 10 to 23 percent of people	Glucocorticoids or atypical antipsychotic medications	Microeconomic reversible, low risk
Gestational diabetes	High blood sugar in pregnancy, but risk of Type 2 diabetes in future,	In most cases, there are no symptoms, high blood pressure, high cholesterol, heart disease	More than 1 million cases per year (India)	Healthy diet, daily exercise, fibrous food, low sugar use, vegetables and whole grains	Microeconomic reversible, high risk
Hypertension					
Hypertension	A condition in which the force of the blood against the artery walls is too high	High blood pressure often has no symptoms	More than 10 million cases per year (India) Very common	Eating a healthier diet with less salt, exercising regularly and taking medication	Heart disease and stroke
Obesity					
Obesity	Deposition of excessive amount of body fat Excessive body fat increases the risk of serious health problems	Consumption of more calories than are burned by exercise and normal daily activities, obesity with a body mass index is 25 or greater.	More than 1 million cases per year (India) Very common	Lifestyle changes such as diet and exercise.	Macroeconomic, reversible, high risk

Alcoholism					
Alcoholism	A chronic disease caused due to drinking and preoccupation with alcohol. With high BP, heart disease, stroke, liver disease	Physical and emotional dependence on alcohol, repeated alcohol consumption despite related legal and health issues, feel guilty.	More than 10 million cases per year (India) Very common	A detoxification programme in a hospital or medical facility, medicines to reduce the desire to drink.	Macroeconomic, reversible, high risk
Smoking					
Smoking	Cigarette, Nicotine addiction ,	Develop heart disease, stroke, and lung cancer; it causes cancer, heart disease, stroke, lung diseases, diabetes, and chronic obstructive pulmonary disease	Smoking causes 8 out of 10) of all deaths from chronic obstructive pulmonary disease (COPD)	Nicotine replacement therapy	Macroeconomic, irreversible, high risk, stroke and coronary heart disease
Narcotics					
Narcotics	Physical dependence on the drug	Use of opiates and opioids, morphine and heroin, as well as derivatives of many of the compounds found within raw opium latex or drug that produces analgesia (pain relief), narcosis	Around 275 million people used drugs worldwide and 11.8 million deaths reported each year	Behavioral change, counseling, rehabilitation and detoxification	Macroeconomic, irreversible, high risk

**Table 1:** Important NCDs and its associating disorders in man, its causes, treatment methods and disease burden.

\*Morbidity rates are according to international data reported by W.H.O.

## Conclusion

It is true today NCDs creating havoc as large portion of world population mainly youngsters are in grip of these diseases. There is a rising economy, urbanization, pollution and NCDs. Among major causes are awareness, social behavior, medication and food habit. the proportion of crude NCD burden attributable to infectious causes was 11.7%, which was higher than the proportion of burden attributable to each of several common risk factors of NCDs. There is high prevalence of use of tobacco, alcohol, smoking, and narcotics with additional burden of high systolic blood pressure, dietary risks, high fasting plasma glucose, air pollution, and high

LDL cholesterol. In other broad regions, infectious causes ranked between fifth and eighth in terms of crude attributable proportions among the nine risks compared. Ethnicity is also one of the important factors with age and sex related infectious risks remained highest in sub-Saharan Africa of the broad regions. Compared to the urban residence status, the relative risk of living in a rural area significantly increased the risk of having 1 or 2 risk factors by a multiple of 1.55. Conclusions: The non-communicable disease burden is on the increase, with more participants reporting to have at least two risk factors. Besides, endogenous factors, exogenous factors such as region, residence status, land tenure

system and behavioral characteristics have significant causal effects on the cumulative NCD risk factors. There is an urgent need to maintain health care institutions, medical care, socio-economic development, community awareness and health planning and treatment rate and recovery. Absence of known agent, multi-factorial causation, long living period and indefinite onset, CVD, coronary heart diseases, smoking, hypertension, serum cholesterol, obesity, cancer blindness. Non-communicable diseases (NCDs) are increasing in prevalence in low-income countries including Uganda. Huge funds are required for allocation of human resources and essential medicines and up gradation of technologies for diagnosis and treatment. Funds are also required for purchase of equipment modalities are desperately needed in order to adequately address the rapidly growing NCD burden.

### Acknowledgements

Authors are thankful to H.O.D., Department of Zoology for research facilities.

### Disclosure of Conflict of Interest

The authors declare no competing financial interests.

### Bibliography

- Williams J., *et al.* "A systematic review of associations between non-communicable diseases and socioeconomic status within low- and lower-middle-income countries". *Journal of Global Health* 8.2 (2018): 020409.
- Cundale K., *et al.* "Reframing noncommunicable diseases and injuries for the poorest Malawians: the Malawi National NCDI Poverty Commission". *Malawi Medical Journal* 29.2 (2017): 194-197.
- Kang, *et al.* "Global and Regional Patterns in Noncommunicable Diseases and Dietary Factors across National Income Levels". *Nutrients* 13.10 (2021): 3595.
- Bromage S., *et al.* "Development and Validation of a Novel Food-Based Global Diet Quality Score (GDQS)". *Journal of Nutrition* 151 (2021): 75S-92S.
- Caprara G., *et al.* "Mediterranean-Type Dietary Pattern and Physical Activity: The Winning Combination to Counteract the Rising Burden of Non-Communicable Diseases (NCDs)". *Nutrients* 13.2 (2021): 429.
- Akseer N., *et al.* "Non-communicable diseases among adolescents: current status, determinants, interventions and policies". *BMC Public Health* 20.1 (2020): 1908.
- Bente M., *et al.* "Life course approach to prevention and control of non-communicable diseases". *BMJ* 364 (2019): 1257.
- Sivanantham P., *et al.* "Profile of risk factors for Non-Communicable Diseases (NCDs) in a highly urbanized district of India: Findings from Puducherry district-wide STEPS Survey, 2019-20". *PLoS One* 16.1 (2021): e0245254.
- Budreviciute A., *et al.* "Management and Prevention Strategies for Non-communicable Diseases (NCDs) and Their Risk Factors". *Frontiers in Public Health* 8 (2020): 574111.
- Rogers HE., *et al.* "Legal capacities required for prevention and control of noncommunicable diseases". *Bulletin of the World Health Organization* 97.2 (2019): 108-117.
- Savage A., *et al.* "Climate change and socioeconomic determinants are structural constraints to agency in diet-related non-communicable disease prevention in Vanuatu: a qualitative study". *BMC Public Health* 21.1 (2021): 1231.
- Coates MM., *et al.* "Burden of non-communicable diseases from infectious causes in 2017: a modelling study". *Lancet Global Health* 8.12 (2020): e1489-e1498.
- Chen S and Bloom DE. "The macroeconomic burden of noncommunicable diseases associated with air pollution in China". *PLoS One* 14.4 (2019): e0215663.
- Kazibwe J., *et al.* "The household financial burden of non-communicable diseases in low- and middle-income countries: a systematic review". *Health Research Policy and Systems* 19.1 (2021): 96.
- Goryakin Y., *et al.* "Assessing the future medical cost burden for the European health systems under alternative exposure-to-risks scenarios". *PLoS One* 15.9 (2020): e0238565.
- Kinoshita M., *et al.* "Japan Atherosclerosis Society (JAS) Guidelines for Prevention of Atherosclerotic Cardiovascular Diseases" 2017". *Journal of Atherosclerosis and Thrombosis* 25.9 (2018): 846-984.
- Bray F., *et al.* "Comparing cancer and cardiovascular disease trends in 20 middle- or high-income countries 2000-19: A pointer to national trajectories towards achieving Sustainable Development goal target 3.4". *Cancer Treatment Review* 100 (2021): 102290.

18. Wang Y, *et al.* "Association of heart rate with cardiovascular events and mortality in hypertensive and normotensive population: a nationwide prospective cohort study". *Annals of Translational Medicine's* 9.11 (2021): 917.
19. Roth GA, *et al.* "American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. Heart Disease and Stroke Statistics-2021 Update: A Report From the American Heart Association". *Circulation* 143.8 (2021): e254-e743.
20. Ashraf T, *et al.* "Global, regional, and national burden of stroke and its risk factors, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019". *Lancet Neurology* 20.10 (2021): 795-820.
21. Videira RF, *et al.* "Non-Coding RNAs as Blood-Based Biomarkers in Cardiovascular Disease". *International Journal of Molecular Sciences* 21.23 (2020): 9285.
22. Zhou SS, *et al.* "miRNAs in cardiovascular diseases: potential biomarkers, therapeutic targets and challenges". *Acta Pharmacologica Sinica* 39.7 (2018): 1073-1084.
23. Parsanathan R and Jain SK "Novel Invasive and Noninvasive Cardiac-Specific Biomarkers in Obesity and Cardiovascular Diseases". *Metabolic Syndrome and Related Disorders* 18.1 (2020): 10-30.
24. Elkind MSV, *et al.* "American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. Heart Disease and Stroke Statistics-2020 Update: A Report From the American Heart Association". *Circulation* 141.9 (2020): e139-e596.
25. Mendenhall E, *et al.* "Non-communicable disease syndemics: poverty, depression, and diabetes among low-income populations". *Lancet* 389.10072 (2017): 951-963.
26. Haeusler KG, *et al.* "Impact of chronic inflammatory airway disease on stroke severity and long-term survival after ischemic stroke--a retrospective analysis". *BMC Neurology* 15 (2015): 164.
27. Boulanger M, *et al.* "Long-Term Risk of Myocardial Infarction Compared to Recurrent Stroke After Transient Ischemic Attack and Ischemic Stroke: Systematic Review and Meta-Analysis". *Journal of the American Heart Association* 7.2 (2018): e007267.
28. Kronenberg G, *et al.* "Charting the perfect storm: emerging biological interfaces between stress and stroke". *European Archives of Psychiatry and Clinical Neuroscience* 267.6 (2017): 487-494.
29. Ueno Y, *et al.* "Specific mechanisms of subarachnoid hemorrhage accompanied by ischemic stroke in essential thrombocythemia: two case reports and a literature review". *Journal of Neurology* 266.8 (2019): 1869-1878.
30. Seiffge DJ, *et al.* "Timing of anticoagulation after recent ischaemic stroke in patients with atrial fibrillation". *Lancet Neurology* 18.1 (2019): 117-126.
31. Samanta S, *et al.* "Cardiovascular care of patients with stroke and high risk of stroke: The need for interdisciplinary action: A consensus report from the European Society of Cardiology Cardiovascular Round Table". *European Journal of Preventive Cardiology* 27.7 (2020): 682-692.
32. Doehner W, *et al.* "Cardiovascular care of patients with stroke and high risk of stroke: The need for interdisciplinary action: A consensus report from the European Society of Cardiology Cardiovascular Round Table". *European Journal of Preventive Cardiology* 27.7 (2020): 682-692.
33. Jacob CM, *et al.* "Prevention of noncommunicable diseases by interventions in the preconception period: A FIGO position paper for action by healthcare practitioners". *International Journal of Gynecology and Obstetrics* 151 (2020): 6-15.
34. Chakraborty S, *et al.* "Metabolites and Hypertension: Insights into Hypertension as a Metabolic Disorder: 2019 Harriet Dustan Award". *Hypertension* 75.6 (2020): 1386-1396.
35. Zhou B, *et al.* "Global epidemiology, health burden and effective interventions for elevated blood pressure and hypertension". *Nature Reviews Cardiology* 18.11 (2021): 785-802.
36. Manosroi W and Williams GH. "Genetics of Human Primary Hypertension: Focus on Hormonal Mechanisms". *Endocrine Review* 40.3 (2019): 825-856.
37. Rodriguez-Iturbe B, *et al.* "Role of the Immune System in Hypertension". *Physiology Review* 97.3 (2017): 1127-1164.
38. Bonfrate L, *et al.* "A novel therapeutic effect of statins on nephrogenic diabetes insipidus". *Journal of Cellular and Molecular Medicine* 19.2 (2015): 265-282.
39. Fox CS, *et al.* "Update on Prevention of Cardiovascular Disease in Adults With Type 2 Diabetes Mellitus in Light of Recent Evidence: A Scientific Statement From the American Heart Association and the American Diabetes Association". *Diabetes Care* 38.9 (2015).

40. Wang CC., *et al.* "Clinical Update: Cardiovascular Disease in Diabetes Mellitus: Atherosclerotic Cardiovascular Disease and Heart Failure in Type 2 Diabetes Mellitus - Mechanisms, Management, and Clinical Considerations". *Circulation* 133.24 (2019): 2459-2502.
41. Sanyoura M., *et al.* "Monogenic Diabetes in Children and Adolescents: Recognition and Treatment Options". *Current Diabetes Reports* 18.8 (2018): 58.
42. DeVito EE., *et al.* "Neural correlates of impulsivity in healthy males and females with family histories of alcoholism". *Neuropsychopharmacology* 38.10 (2013): 1854-1863.
43. Thapa S., *et al.* "Time-Varying Effects of Parental Alcoholism on Depression". *Preventing Chronic Disease* 14 (2017): E136.
44. Enoch MA. "Genetic influences on the development of alcoholism". *Current Advances in Psychiatry* 15.11 (2013): 412.
45. Roseman E and Aring CD "The neurology of alcoholism". *California Medicine* 67.1 (1947): 51-59.
46. Moonat S and Pandey SC. "Stress, epigenetics, and alcoholism". *Alcohol Research* 34.4 (2012): 495-505.
47. Chu LF., *et al.* "From mouse to man: the 5-HT<sub>3</sub> receptor modulates physical dependence on opioid narcotics". *Pharmacogenet Genomics* 19.3 (2009): 193-205.
48. Grunkemeier DM., *et al.* "The narcotic bowel syndrome: clinical features, pathophysiology, and management". *Clinical Gastroenterology and Hepatology* 5.10 (2007): 1126-1122.
49. Ko JY., *et al.* "CDC Grand Rounds: public health strategies to prevent neonatal abstinence syndrome". *MMWR: Morbidity and Mortality Weekly Report* (2017): 66.
50. Cone EJ., *et al.* "Non-smoker exposure to secondhand cannabis smoke". Urine screening and confirmation results". *Journal of Analytical Toxicology* 39.1 (2015): 1-12.
51. Coates MM., *et al.* "Burden of non-communicable diseases from infectious causes in 2017: a modelling study". *Lancet Global Health* 8.12 (2020): e1489-e1498.
52. Cheza A., *et al.* "Incidence of non-communicable diseases (NCDs) in HIV patients on ART in a developing country: Case of Zimbabwe's Chitungwiza Central Hospital-A retrospective cohort study (2010-2019)". *PLoS One*. 16.5 (2021): e0252180.
53. Wesonga R., *et al.* "Burden of cumulative risk factors associated with non-communicable diseases among adults in Uganda: evidence from a national baseline survey". *International Journal for Equity in Health* 15 (2016): 195.
54. Ojo TT., *et al.* "Exploring knowledge and attitudes toward non-communicable diseases among village health teams in Eastern Uganda: a cross-sectional study". *BMC Public Health* 17 (2017): 947.
55. Gupta N., *et al.* "Availability of equipment and medications for non-communicable diseases and injuries at public first-referral level hospitals: a cross-sectional analysis of service provision assessments in eight low-income countries". *BMJ Open* 10.10 (2020): e038842.
56. Krishnan A., *et al.* "Preparedness of primary and secondary health facilities in India to address major noncommunicable diseases: results of a National Noncommunicable Disease Monitoring Survey (NNMS)". *BMC Health Service Research* 21 (2021): 757.
57. Alexander Kintu., *et al.* "Integrating care for non-communicable diseases into routine HIV services: key considerations for policy design in sub-Saharan Africa". *Journal of the International AIDS Society* 23 (2020): e25508.
58. Wickramasinghe K., *et al.* "The development of national multisectoral action plans for the prevention and control of noncommunicable diseases: experiences of national-level stakeholders in four countries". *Global Health Action* 11.1 (2011): 1532632.
59. McGrady B., *et al.* "Legal capacities required for prevention and control of noncommunicable diseases". *Bulletin of the World Health Organization* 97.2 (2019): 108-117.

#### Assets from publication with us

- Prompt Acknowledgement after receiving the article
- Thorough Double blinded peer review
- Rapid Publication
- Issue of Publication Certificate
- High visibility of your Published work

**Website:** [www.actascientific.com/](http://www.actascientific.com/)

**Submit Article:** [www.actascientific.com/submission.php](http://www.actascientific.com/submission.php)

**Email us:** [editor@actascientific.com](mailto:editor@actascientific.com)

**Contact us:** +91 9182824667