

Overview of Major Noncommunicable Diseases (NCD)

MODULE
1



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MODULE

1

Overview of
Noncommunicable Diseases

Introduction

Noncommunicable diseases (NCDs) are considered a major public health concern worldwide. They account for 60 percent of total deaths globally (with 40 million deaths estimated occurring annually), and contribute to 40 percent of universal disease burden annually. It is projected that if no action is done in the present, these rates would increase to as high as 73 percent to total deaths and 60 percent to disease burden respectively by 2020 (WHO, 2005). The rapidly increasing burden of these diseases is affecting poor and disadvantaged populations disproportionately, contributing to widening health gaps between and within countries.

The prevalence of NCD continues to rise in the Philippines and promoting healthy lifestyle is very much needed and relevant as ever. More than half (58%) of total deaths in the country in 2003 were caused by NCDs. Diseases of the heart and vascular system made up almost one-third (30.2%) of all deaths (Philippine Health Statistics, 2003). Other NCDs in the top list include malignant neoplasm, chronic obstructive pulmonary diseases (COPD) and diabetes mellitus. NCDs have replaced the positions of infectious diseases particularly pneumonia and tuberculosis as top-most common causes of deaths.

Objectives

At the end of this module, you should be able to:

1. Describe the epidemiology of the major NCDs in the Philippines
2. Explain the causes and risk factors of the major NCDs
3. Discuss the key areas for primary prevention of the major NCDs
4. Describe the regional and national framework for the Integrated Community-based Prevention and Control of NCDs



1. Epidemiology of the Major NCDs

The four major NCDs in the Philippines are cardiovascular diseases, cancers, chronic obstructive pulmonary diseases and diabetes mellitus. These diseases are linked by four most common preventable risk factors related to lifestyle, namely: tobacco use, unhealthy diet, lack of physical activity and alcohol use.

The Philippines is one of the 23 selected countries that contribute to around 80% of the total mortality burden attributable to chronic diseases in developing countries, and 50% of the total disease burden caused by non-communicable diseases worldwide (Lancet, 2007). This is not surprising since the data shows that 90% of Filipinos have one or more of the six prevalent risk factors to NCD; i.e., smoking, physical inactivity, hypertension, hypercholesterolemia, overweight and obesity.

The table below shows that heart and vascular system diseases still comprise the top leading causes of mortality in the Philippines. The prevalence of coronary artery diseases based on Angina Questionnaire is 12.5% and hypertension based on Hypertension Questionnaire is 17.4% (Dans et al, 2003).

Table 1.1 Leading causes of mortality, 5-year average (2000-2004) & 2005
(number, rate per 100,000 population)
Philippine Health Statistics, 1990-2005, DOH

Causes	Number	Rate	Number	Rate
1. Diseases of the Heart	66,412	83.3	77,060	90.4
2. Diseases of the Vascular System	50,886	63.9	54,372	63.8
3. Malignant Neoplasms	38,578	48.4	41,697	48.9
4. Pneumonia	32,989	41.4	36,510	42.8
5. Accidents**	33,455	42.0	33,327	39.1
6. Tuberculosis	27,211	34.2	26,588	31.2
7. Chronic lower respiratory diseases	18,015	22.6	20,951	24.6
8. Diabetes Mellitus	13,584	17.0	18,441	21.6
9. Certain conditions originating in the perinatal period	14,477	18.2	12,368	14.5
10. Nephritis, nephrotic syndrome and nephrosis	9,166	11.5	11,056	13.0

Note: Excludes ill-defined and unknown causes of mortality

* reference year

** external cause of mortality



1.1 Physical Inactivity

In the list of risk factors for NCD, physical inactivity tops the list for Filipinos in 2003. As much as 60.5 percent of Filipinos lack physical activity.

Table 1.2 Risk factors of Noncommunicable Diseases, FNRI (2003)

Risk Factors	Percent
1. Physical inactivity	60.5%
2. Smoking	34.8%
3. Hypertension	22.5%
4. Overweight	19.6%
5. Hypercholesterolemia	8.5%
6. Obesity	4.8%
7. Diabetes mellitus	4.6%

Almost the entire adult population has low levels of physical activity in all domains: occupation, non-occupation, leisure, and transportation (Table 1.3). The distribution of population by physical inactivity domain and age group is shown in Table 1.4.

Table 1.3 Proportions of physically inactive Filipino adults > 20 years based on Global Physical Activity Questionnaire, FNRI (2003)

Physical Inactivity Domains	All (%)	Male (%)	Female (%)
Occupational	72.2	67.0	82.1
Non-occupational	81.5	90.1	72.4
Transportation-related	92.6	91.0	94.3
Leisure time	92.6	90.0	95.5

Table 1.4 Distribution of population by physical inactivity domain & age group, based on Global Physical Activity Questionnaire, FNRI (2003)

Age group	Leisure		Occupational		Non-Occupational		Transport-related	
	N	%	n	%	n	%	n	%
All	3050	92.6	1517	72.2	2489	81.5	3027	92.6
20-35	1067	93.3	560	70.3	961	87.4	1053	92.4
36-49	760	91.7	410	73.7	640	79.1	763	93.1
50-65	1223	92.3	547	75.5	888	70.2	1211	92.2



1.2 Smoking

Smoking prevalence was shown to be as high as 31% in the population in 2008; with 53% among males and 12.5% among females. Trend in smoking or tobacco use among adolescents is seen to be rising (Table 1.5). In 2007, the results of the Global Youth Tobacco Survey (GYTS) targeting 13-15 year old showed a prevalence of 23.4% among boys and 12% among girls. In 2009, the Global Adult Tobacco Survey (GATS), 28.3% of adults currently smoke with 48% among males and 9.0% among females. Around 37% were exposed to tobacco smoke in enclosed areas at their workplace and 54.4% were exposed to smoke at home.

Table 1.5 Prevalence of current smoking, 1998-2008, FNRI (2008)

Age/Sex	All	Males	Females
1998	32.7%	54.0%	12.6%
2003	35.2%	57.4%	10.9%
2008	31.0%	53.2%	12.5%

1.3 Hypertension

The prevalence of hypertension by age group is shown to be increasing over the years: 21% (1998), 22.5% (2003) and 25.3% (2008) (Figure 1.1). Hypertension is defined as single visit systolic BP of > 140 mm Hg, or diastolic BP of > 90 mm Hg, or history of diagnosis of hypertension, or intake of anti-hypertension medications.

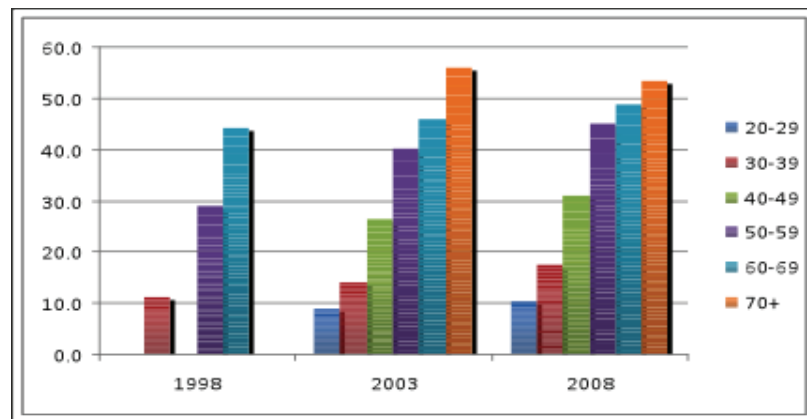


Figure 1.1 Prevalence of hypertension by age-group (1998-2008) FNRI (2008)



1.4 Overweight/ Obesity

1.4.1 Overweight in Children

Trends in overweight among children are seen to be increasing over the years. Among children 0-5 years and 6-10 years, the prevalence of overweight is 2% and 1.6% respectively (Figure 1.2). Among those who are 11-12 years old, 5.8% are overweight and among 13-19 years, 4.4% (Figure 1.3).

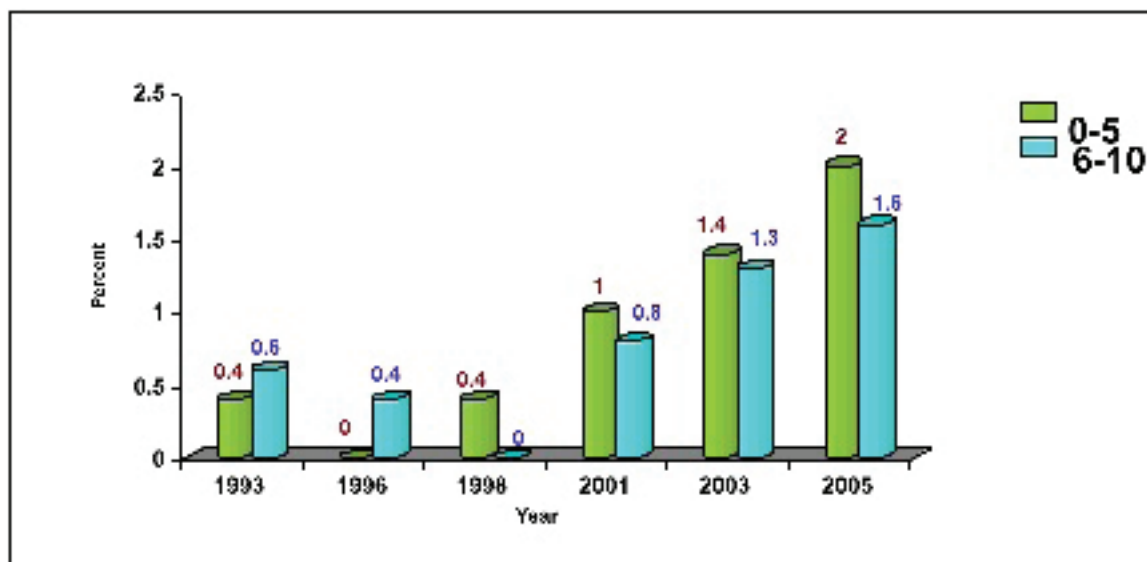


Figure 1.2 Trends in overweight among children 0-10 Years Old, WHO-WPRO (2005)

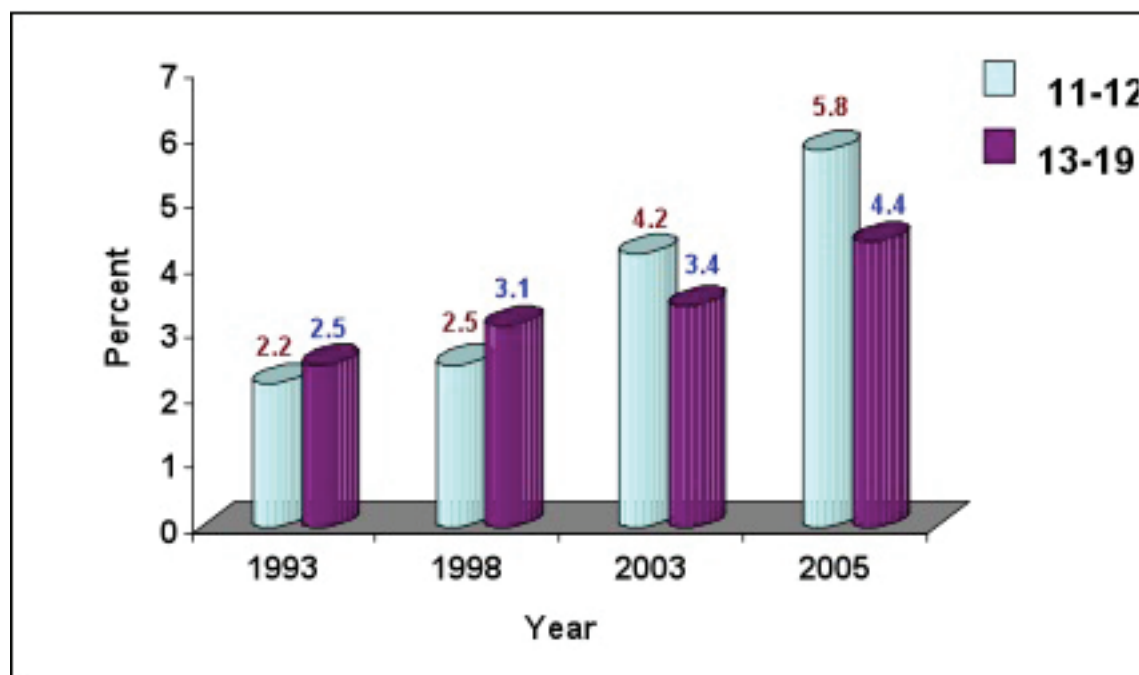


Figure 1.3 Trends in overweight among children 11-19 Years Old, WHO-WPRO (2005)



1.4.2 Waist Circumference and Waist-Hip Ratio

The prevalence of high waist circumference and high waist-hip ratio among males and females was also shown to have increased from 1998-2008.

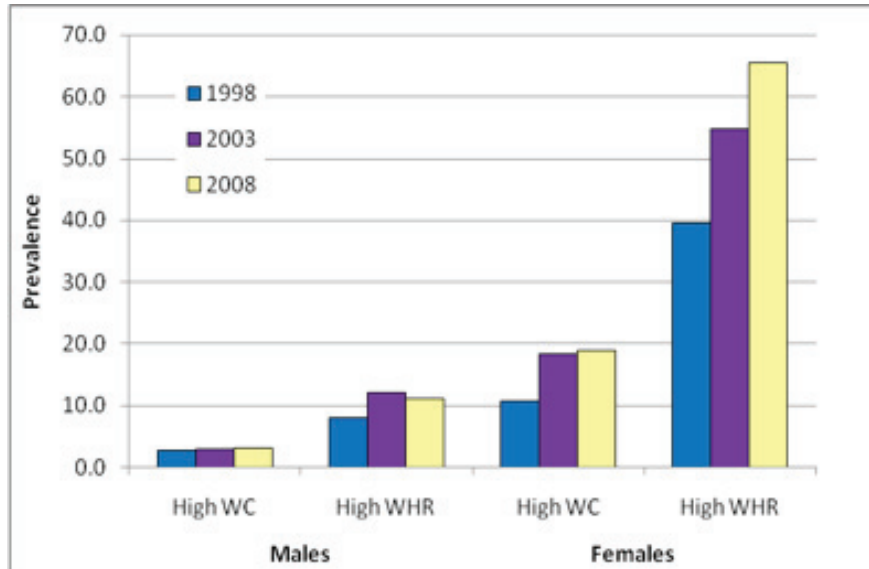


Figure 1.4 Prevalence of high waist circumference (WC) & waist-hip ratio (WHR) among Filipino adults by gender, 1998-2008, FNRI (2008)

The prevalence of android obesity among women is also high as indicated by the waist circumference and waist-hip ratio comparing males and females (Figure 1.5).

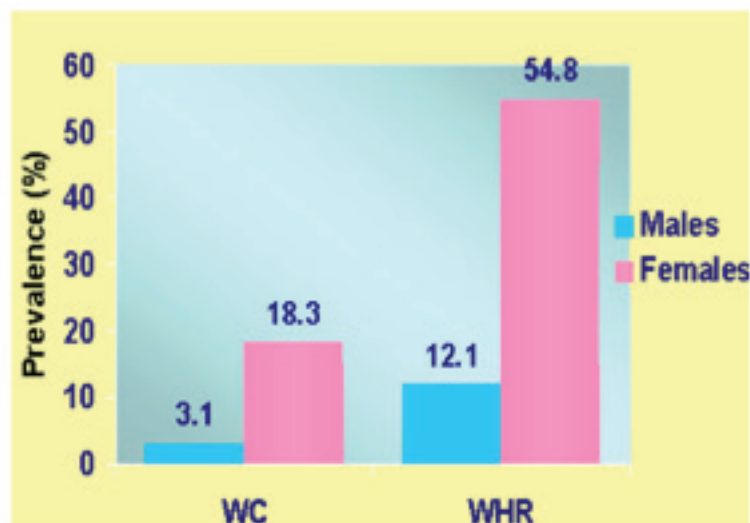


Figure 1.5 Prevalence of android obesity based on WHO Criteria for waist-hip ratio (WHR) and waist circumference (WC), NNHeS: 2003-2004



1.4.3 Body Mass Index

Obesity or overweight can best be assessed using the Body Mass Index (BMI). The BMI is a measure of body fat based on height and weight. It is calculated by dividing the person's weight in kilograms (kg) by the height in meters squared (m²). Overweight is a BMI between 23.0 to 24.9 and obesity is a BMI of 25 and above.

The body mass index distribution of Filipino adults > 20 years old is shown to be increasing from 1998 to 2008 (see Table 1.6).

Table 1.6 Prevalence of overweight/ obesity according to body mass index, 1998-2008, FNRI (2008)

	1998	2003	2008
Body Mass Index	20.2	24.0	26.6

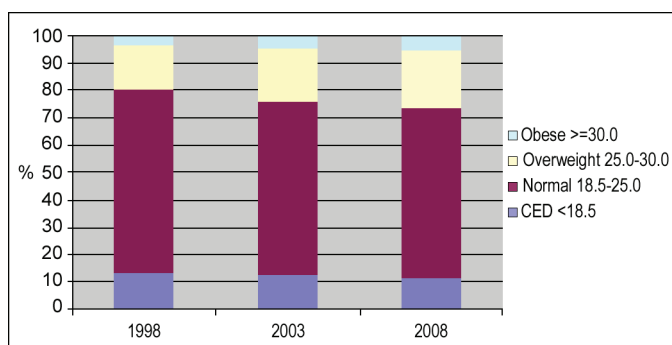


Figure 1.6 Distribution of Filipino adults > 20 years old by BMI, 1998-2008, FNRI (2008)

When disaggregated by age group, BMI was seen to be high in age groups 30-69 year old (see Table 1.7). Overweight is defined as BMI greater than or equal to 25.0.

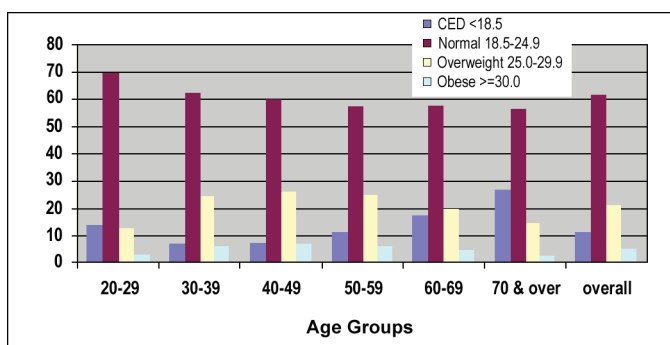


Figure 1.7 Distribution of Filipino adults > 20 years by BMI & by age group, 2008, FNRI (2008)



1.5 Hypercholesterolemia

Hypercholesterolemia is the presence of high levels of cholesterol in the blood. Elevated cholesterol in the blood is due to abnormalities in the levels of lipoproteins, the particles that carry cholesterol in the bloodstream. This may be related to diet, genetic factors (such as LDL receptor mutations in familial hypercholesterolemia) and the presence of other diseases such as diabetes and an underachieved thyroid.

The prevalence of hypercholesterolemia (dyslipidemia) is also seen to be increasing from 1998 to 2008 as shown in Table 1.7. Figure 1.8 shows the prevalence of dyslipidemia among Filipino adults >20 years old by sex in 1998, 2003 and 2008. Figure 1.9 shows the distribution of total cholesterol among Filipino adults >20 years old by sex. Figure 1.10 shows the prevalence of hypercholesterolemia by age group in 2008.

Table 1.7 Prevalence of hypercholesterolemia, 1998-2008, FNRI (2008)

	1998	2003	2008	Basis
Total cholesterol	4.0	8.5	10.2	≥240 mg/dl
LDL – c	8.1	11.7	11.8	≥160 mg/dl
HDL – c	76.6	54.2	64.1	<40 mg/dl
Triglycerides	8.7	9.4	14.6	≥200 mg/dl

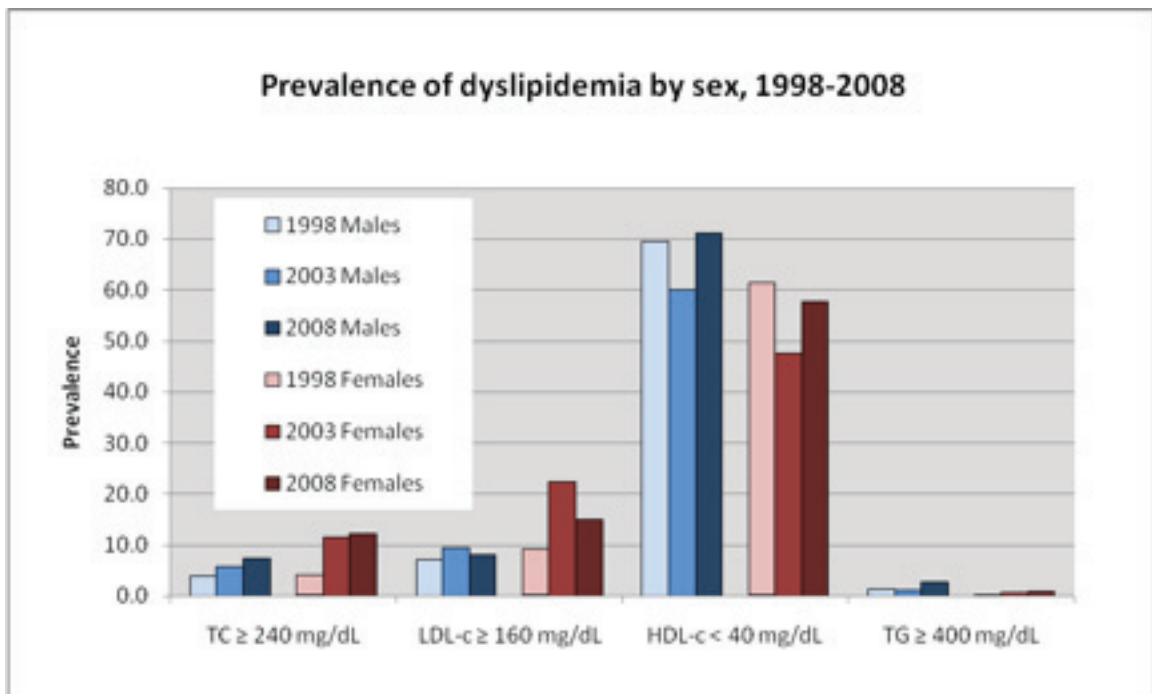


Figure 1.8 Prevalence of dyslipidemia by sex, 1998-2008, FNRI (2008)

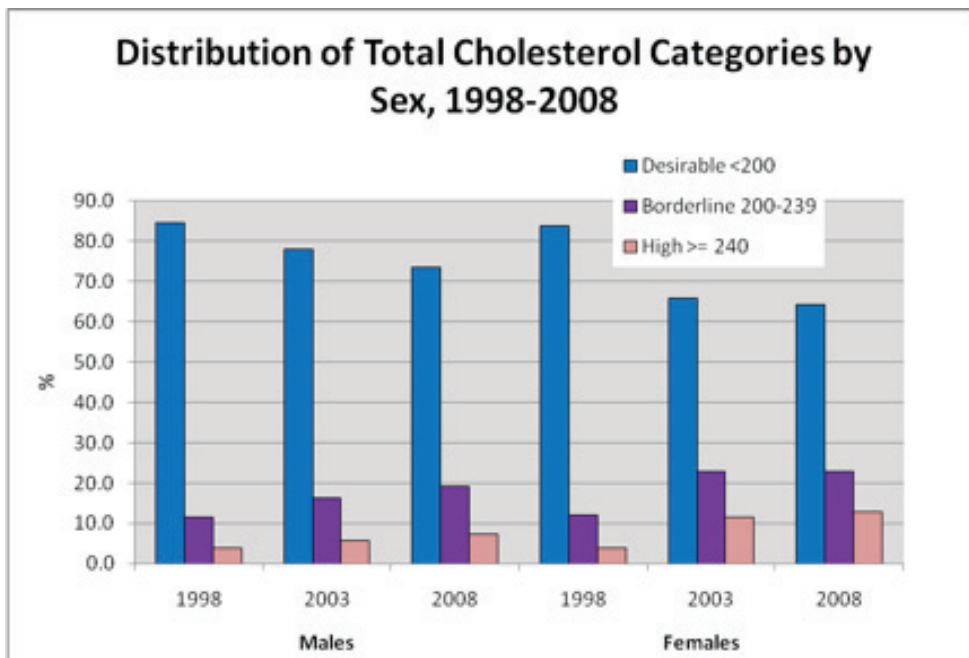


Figure 1.9 Distribution of total cholesterol among Filipino adults >20 years old by sex, 1998-2008, FNRI (2008)

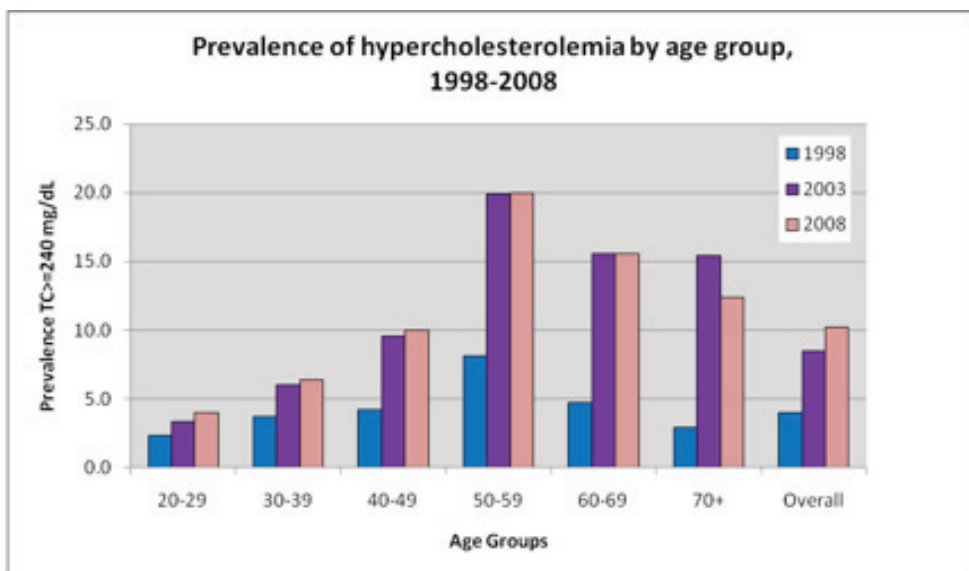


Figure 1.10 Prevalence of hypercholesterolemia by age group, 1998-2008



1.6 Diabetes mellitus

Diabetes mellitus, often simply referred to as diabetes - is a group of metabolic diseases in which a person has high blood sugar, either because the body does not produce enough insulin, or because cells do not respond to the insulin that is produced.

The prevalence of high fasting blood sugar was shown to have increased overall from 1998 to 2008. Table 1.8 shows the trend from 1998-2008. Hyperglycemia is based on fasting blood sugar greater than or equal to 126 mg/dl.

Table 1.8 Prevalence of hyperglycemia, 1998-2008, FNRI (2008)

	1998	2003	2008
Hyperglycemia	3.9	3.4	4.8

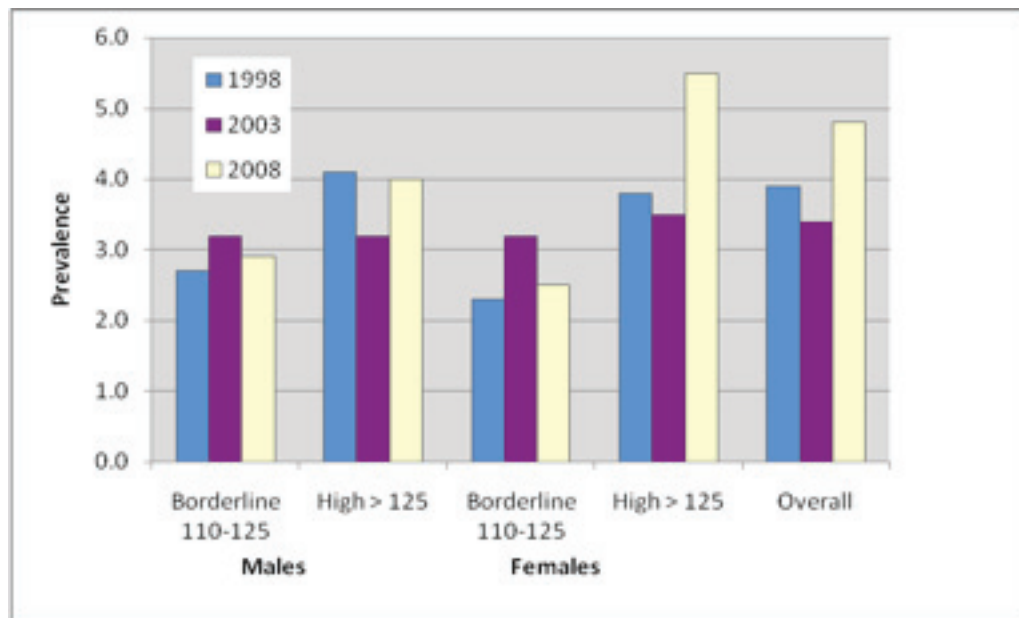


Figure 1.11 Prevalence of high fasting blood sugar (FBS) by sex, 1998-2008, FNRI (2008)

Diabetes prevalence also increased from 3.4% in 2003 to 4.8% in 2008. The prevalence of diabetes by age group is shown to have increased among 50-69 age-group.

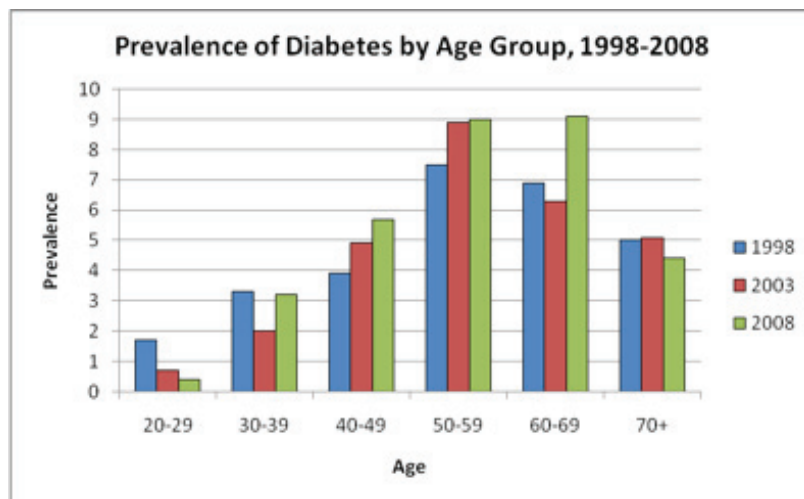


Figure 1.12 Prevalence of diabetes by age group, 1998-2008, FNRI (2008)

1.7 Alcohol intake

Alcohol intake is associated with more than 60 types of diseases and other health conditions, including mental disorders and suicide, several types of cancer, and other NCDs such as cirrhosis, as well as intentional and unintentional injuries.

Alcohol intake in both males and females is shown to have decreased from 2003-2008 (Figure 1.13). However, recent aggressive marketing of alcohol to the younger age group is a cause for alarm. Studies have also shown that alcohol drinking poses more harm and claims for protective effect is still inconsistent.

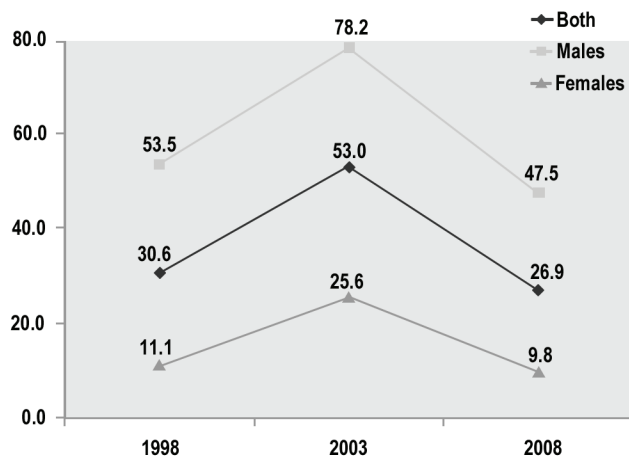


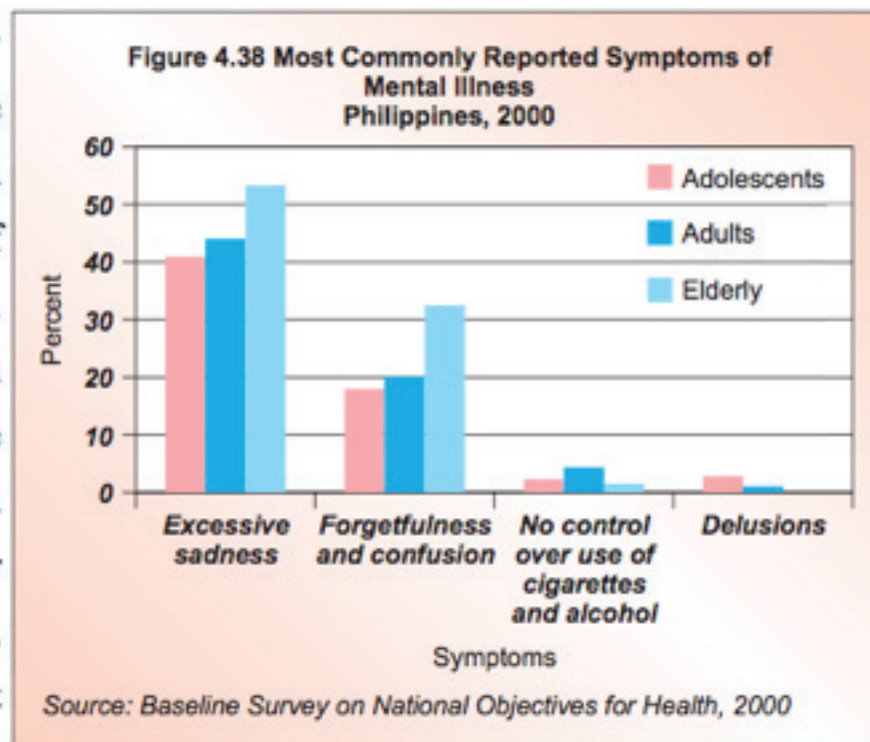
Figure 1.13 Prevalence of alcohol intake by sex, 1998-2008, FNRI (2008)



1.8 Mental health

Studies have shown that mental health is linked with noncommunicable diseases. For example, depression and heart disease (Kuper, Marmot & Hemingway, 2002), stroke (Carson et al., 2002), diabetes (Anderson et al., 2001), asthma (Goldney et al., 2003) and cancer (De Boer et al., 1999). Tobacco and alcohol use may influence onset, course and outcomes of heart disease.

In a DOH survey (2000), most commonly reported symptoms of mental illness in the Philippines include two important mental health illness closely linked with noncommunicable diseases, specifically excessive sadness and no control over use of cigarettes and alcohol. The inclusion of promoting mental health in the prevention and control of chronic lifestyle-related noncommunicable diseases then becomes imperative.





2. Causes and Risk Factors of the Major NCDs

Causes of major NCDs can be traced to a number of underlying determinants, common risk factors and intermediated risk factors. Globalization, urbanization and population ageing are global scenarios that leads to common risk factors such as unhealthy diet, physical inactivity, tobacco and alcohol use to be on the rise in the population. These common risk factors give rise to intermediate risk factors such as high blood pressure, elevated blood glucose, abnormal lipid profiles and overweight/obesity. These intermediate risk factors then predispose individuals to the “fatal four” – cardiovascular diseases, cancer, chronic respiratory diseases and diabetes mellitus.



Figure 1.13 Causation Pathway of Major Noncommunicable Diseases

Among the common risk factors cited, age and heredity are the only ones that cannot be prevented nor modified. However, an estimated 80% of premature heart disease, stroke, and type-2 diabetes, and 40% of cancer, could be avoided through healthy diet, regular physical activity, and avoidance of tobacco use.

Another way of looking at the common risk factors and intermediate risk factors and how they are related to the major NCDs is presented in Table 1.9. In this table, it is clearly seen how the different major NCDs share common risk factors and intermediate factors. A comparison of the prevalence of selected risk factors showed a steady increase from 1998 to 2003 and 2008 (see Table 1.10).



Table 1.9 Common Risk Factors Leading to Major NCDs, WHO (2003)

Risk Factors	Cardiovascular diseases*	Diabetes mellitus	Cancers	Chronic Respiratory diseases**
Smoking	✓	✓	✓	✓
Diet/Nutrition	✓	✓	✓	✓
Physical inactivity	✓	✓	✓	✓
Obesity	✓	✓	✓	✓
Alcohol	✓		✓	
Raised blood pressure	✓	✓		
Raised blood sugar	✓	✓	✓	
Abnormal blood lipids	✓	✓	✓	

* coronary artery disease, hypertension, stroke

** chronic obstructive pulmonary disease, asthma

Table 1.10 Prevalence of hypertension, hyperglycemia, dyslipidemia & overweight 1998, 2003 and 2008, FNRI (2008)

Risk Factors	1998	2003	2008	Basis
Hypertension	21.0 (17.2*)	22.5 (17.4*)	25.3	SBP≥140, DBP ≥90
Hyperglycemia	3.9	3.4	4.8	FBS ≥ 126 mg/dL
Total cholesterol	4.0	8.5	10.2	≥240 mg/dL
LDL – c		11.7	11.8	≥160 mg/dL

3. Description of Major NCDs

3.1 Cardiovascular diseases

Cardiovascular diseases include diseases of the heart and blood vessels such as coronary artery disease, hypertension and stroke.



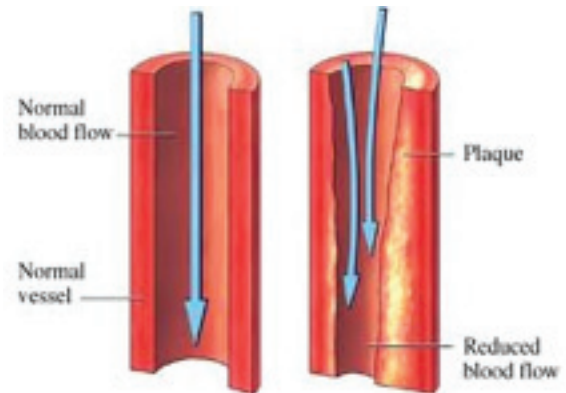
3.1.1 Coronary artery disease

Coronary Artery Disease is heart disease caused by impaired coronary blood flow. It is also known as ischemic heart disease. When the coronary arteries become narrowed or clogged, supply of blood and oxygen to the heart muscle is affected. When there is decreased oxygen supplied to the heart muscle, chest pain (called angina) occurs. Coronary artery disease can cause myocardial infarction (heart attack), arrhythmias, heart failure, and sudden death.



3.1.1.1 Causes of Coronary Artery Disease

The most common cause is **atherosclerosis**. This is the thickening of the inside walls of arteries due to deposition of a fat-like substance. This thickening narrows the space through which blood can flow, decreasing and sometimes completely cutting off the supply of oxygen and nutrients to the heart. It affects large and medium-sized arteries like the aorta, coronary arteries and the large vessels that supply the brain. Atherosclerosis usually occurs when a person has high levels of cholesterol in the blood. When the level of cholesterol in the blood is high, there is a greater chance that it will be deposited onto the artery walls. This process begins in most people during childhood and teenage years, but gets worse as they get older. In diabetes mellitus, atherosclerosis is accelerated, often resulting in coronary artery disease, myocardial infarction and stroke.



3.1.1.2 Risk factors of Coronary Artery Disease (CAD)

Some risk factors are non-modifiable such as age and heredity. Some are modifiable, such as elevated blood lipids and cholesterol level (hypercholesterolemia), hypertension, smoking, diabetes mellitus, obesity, physical inactivity and stress. A person who has all three risk factors (hypertension, high cholesterol and smokes) is eight times more likely to develop heart disease than someone who has none.



RISK FACTORS FOR CAD:

- Elevated blood cholesterol
- Smoking
- Hypertension
- Obesity
- Physical Inactivity

Elevated blood lipids/cholesterol

- Increased blood cholesterol is an important risk factor in the development of coronary artery disease. Studies have shown that modest reduction in total cholesterol can significantly lessen cardiovascular morbidity and mortality.
- High LDL (low-density lipoprotein) level is a risk factor of coronary artery disease. It is called the “bad” cholesterol because it is the main carrier of cholesterol and contributes to atherosclerosis. LDL level is increased by high saturated fat intake, obesity, sedentary lifestyle, smoking, androgens and certain drugs.
- Not all cholesterol is bad. HDL (high-density lipoprotein) is now acknowledged as a protective factor against coronary heart disease. HDL facilitates reverse transport of cholesterol to the liver where it may be excreted and therefore prevents atherosclerosis. When HDL level is below normal, this becomes a risk factor for coronary artery disease. It is decreased in smoking, obesity and diabetes mellitus. Regular exercise and moderate alcohol consumption increase HDL levels.



Smoking/ Tobacco Use

- Risk of death from coronary artery disease is 70-200 times greater for those who smoke one or more packs of cigarettes per day compared to those who do not smoke. This risk is most seen in young people, particularly those younger than 50 years old

Hypertension and smoking double your chance of developing heart disease if you have high cholesterol.

Obesity and being overweight increase the chance of developing high blood cholesterol and high blood pressure.

Physical inactivity increases the risk of heart attack.

Diabetes is an independent risk factor for coronary artery disease; this means that having diabetes even without other risk factors may lead to heart disease. That is because diabetes accelerates development of atherosclerosis.



Prevention of Coronary Artery Disease

- Promote regular physical activity and exercise because these increase HDL, prevent obesity and improve optimum functioning of the heart.
- Encourage proper nutrition particularly by limiting intake of saturated fats that increase LDL, limiting salt intake and increasing intake of dietary fiber by eating more vegetables, fruits, unrefined cereals and wheat bread.
- Maintain body weight and prevent obesity through proper nutrition and physical activity/ exercise.
- Promote smoking cessation for active smokers and prevent exposure to second-hand smoke by family members, friends and co-workers of active smokers. Promote a smoke-free environment through advocacy and community mobilization.
- Early diagnosis, prompt treatment and control of diabetes and hypertension are important since these contribute to the development of coronary artery disease.

3.2 Hypertension

Hypertension or high blood pressure is defined as a sustained elevation in mean arterial pressure. It is not a single disease state but a disorder with many causes, a variety of symptoms, and a range of responses to therapy. Hypertension is also an intermediate risk factor for the development of other cardiovascular diseases like coronary heart disease and stroke.



3.1.2.1 Causes of hypertension

In terms of etiology, hypertension is classified into primary and secondary hypertension. Primary hypertension has no definite cause. It is also called essential hypertension or idiopathic hypertension. About 90% of all hypertensive have primary hypertension. Although exact cause is unknown, primary hypertension is attributed to atherosclerosis. Secondary hypertension is usually the result of some other primary diseases leading to hypertension such as renal disease.

3.1.2.2 Risk factors of hypertension

There is no single cause for primary hypertension but several risk factors have been implicated in its development. Risk factors include family history, advancing age, race and high salt intake. Other lifestyle factors interact with these risk factors and contribute to the development of hypertension such as obesity, excess alcohol consumption, intake of potassium (diet high in sodium is generally low in potassium; increasing potassium in diet increases elimination of sodium), calcium, and magnesium, stress, and use of contraceptive drugs.

- **Family History**

- Persons with a positive family history of hypertension are twice at risk than those with no history.
- It is not known whether a single gene or multiple genes are involved.

- **Age**

- Older persons are at greater risk for hypertension than younger persons.
The aging processes that increase blood pressure (BP) include stiffening of the arteries, decreased baroreceptor sensitivity, increased peripheral resistance and decreased renal blood flow.
- For years, systolic hypertension common in older persons was considered benign and, therefore, not treated. However, studies showed that there was two to five times increase in death from cardiovascular associated with isolated systolic hypertension.


- **High Salt Intake**

- Excessive salt intake does not cause hypertension in all people, nor does reducing salt intake reduce BP in all hypertensive. Some people are more susceptible than others to effects of increased salt intake.
- How salt intake contributes to hypertension is still not clear. Salt may cause an elevation in blood volume, increase the sensitivity of cardiovascular or renal mechanisms to adrenergic influences, or exert its effects through some other mechanisms such as the renin-angiotensin-aldosterone mechanism.



- **Obesity**
 - Risk for hypertension is two times greater among overweight/obese persons compared to people of normal weight, and three times more than that of underweight persons.
 - Fat distribution is more important risk factor than actual weight as measured by waist-to-hip ratio. Increased waist-to-hip ratio is more associated with hypertension.
 - The exact mechanism of how obesity contributes to the development of hypertension is unknown. Whatever the cause, weight loss is effective in reducing BP in obese hypertensive patients.
 - In one study, weight loss or sodium restriction in hypertensive, controlled for five years, more than doubled the success of withdrawal of drug therapy.

- **Excess Alcohol Intake**
 - As much as 10% of hypertension cases could be related to alcohol consumption.
 - Regular consumption of three or more drinks per day increased risk of hypertension. Systolic pressures were more markedly affected than diastolic pressures.



Prevention of Hypertension

- Proper nutrition – reduce salt and fat intake
- Prevent overweight and obesity – Weight reduction through proper nutrition and increased levels of physical activity and exercise
- Promote smoking cessation – Tobacco use promotes atherosclerosis that may contribute to hypertension
- Early diagnosis and prompt treatment - Identify people with risk factors and encourage regular check-ups for possible hypertension and modification of risk factors.

3.1.3 Cerebrovascular disease or stroke

Stroke is the loss or alteration of bodily function that results from an insufficient supply of blood to some parts of the brain. For human brain to function at peak levels, blood must flow through its many vessels. If the blood flow is obstructed to any part, the brain loses its energy supply and becomes injured. If blood is obstructed for more than several minutes, injury to the brain cells becomes permanent and tissue dies in the affected region resulting in cerebral infarction. Stroke is one of the leading causes of disability. It can lead to weakness or paralysis usually of one side of the body. Often, the person has slurring of speech or even inability to talk (aphasia). Of course, if stroke is massive and severe, it can cause death.



3.1.3.1 Causes of Stroke

There are generally three types of strokes based on cause: thrombotic stroke, embolic stroke and hemorrhagic stroke. Almost all strokes are caused by occlusion of cerebral vessels by either thrombi or emboli. Like coronary artery disease, the common cause of stroke is also atherosclerosis. This time, it is the blood vessels supplying the brain that becomes narrowed.

- **Thrombotic stroke** usually occur in atherosclerotic blood vessels. This is usually seen in older people and may occur in a person at rest.
- An **embolic stroke** is caused by a moving blood clot usually from a thrombus in the left heart that becomes lodged in a small artery through which it cannot pass. Its onset is usually sudden.
- **Hemorrhagic stroke** is the most fatal type of stroke, which is due to intracerebral hemorrhage or rupture of intracerebral blood vessels. The most common predisposing factor is hypertension. Other causes of hemorrhage are aneurysms, trauma, erosion of vessel by tumors, arteriovenous malformations and blood disorders. It usually occurs suddenly, usually when the person is active.

3.1.3.2 Risk factors of stroke

Risk factors of stroke are almost the same as those for coronary artery disease. The more risk factors a person has, the greater the chance that he or she will have a stroke. Some of these factors cannot be controlled, such as increasing age, family health history, race and gender. But other risk factors can be modified such as hypertension, smoking alcohol and drug abuse.

- **Increasing age** - The chance of having a stroke more than doubles for each decade of life after age 55. While stroke is common among the elderly, many people under 65 also have strokes.
- **Sex** - The latest data show that, overall, the incidence and prevalence of stroke are about equal for men and women. However, at all ages, more women than men die of stroke.
- **Heredity (family history) and race** - The chance of stroke is greater in people who have a family history of stroke. African Americans have a much higher risk of disability and death from a stroke than Whites, in part because Blacks have a greater incidence of high blood pressure, a major stroke risk factor.
- **Hypertension** - High blood pressure is the most important risk factor for stroke. In fact, stroke risk varies directly with blood pressure.
- **Cigarette smoking** - In recent years, studies have shown cigarette smoking to be an important risk factor for stroke. The nicotine and carbon monoxide in cigarette smoke damage the cardiovascular system in many ways. The use of oral contraceptives combined with cigarette smoking greatly increases stroke risk.



- Diabetes mellitus - Diabetes is an independent risk factor for stroke and is strongly correlated with high blood pressure. While diabetes is treatable, having it increases a person's risk of stroke. People with diabetes often also have high cholesterol and are overweight, increasing their risk even more.
- Heart disease - People with heart problems have more than twice the risk of stroke as those whose hearts work normally. Atrial fibrillation (rapid, uncoordinated beating of the heart's upper chambers) in particular, raises the risk for stroke. Heart attack is also the major cause of death among stroke survivors.
- High red blood cell count - A moderate or marked increase in the red blood cell count is a risk factor for stroke. The reason is that more red blood cells thicken the blood and make clots more likely. This is present in persons with chronic heart and lung diseases.
- Excessive alcohol intake - Excessive drinking (more than one drink per day for women and more than two drinks per day for men) and binge drinking can raise blood pressure, contribute to obesity, high triglycerides, cancer and other diseases, cause heart failure and lead to stroke.
- Certain kinds of drug abuse - Intravenous drug abuse carries a high risk of stroke from cerebral emboli. Cocaine use has been closely related to strokes, heart attacks and a variety of other cardiovascular complications. Some of them have been fatal even in first-time cocaine users.



Prevention of Stroke

- Prompt treatment and control of hypertension – Effective treatment of high blood pressure is a key reason for rapid decline in death rates for stroke
- Prevent all other risk factors of atherosclerosis.
- Prevent thrombus formation in rheumatic heart disease and arrhythmias with appropriate medications. These medications are usually taken on a daily basis. Health workers need to remind these persons to take their medications as prescribed
- Promote smoking cessation and smoke-free environment.
- Avoid intravenous drug abuse and cocaine.




3.2 Cancers

Cancer is not a single disease and there are many types of cancers. Cancer develops when cells in a part of the body begin to grow out of control. Normal body cells grow, divide, and die in an orderly fashion. During the early years of a person's life, normal cells divide more rapidly until the person becomes an adult. After that, cells in most parts of the body divide only to replace worn-out or dying cells and to repair injuries.

Cancer cells, however, continue to grow and divide even when there is no need to do so. Instead of dying, they outlive normal cells and continue to form new abnormal cells. They compete with normal cells for the blood supply and nutrients thus causing signs and symptoms such as weight loss.

Not all tumors are cancerous. Benign (non-cancerous) tumors usually grow slowly, do not spread to other parts of the body and, with very rare exceptions, are not life threatening unless their location interfere with vital functions like a brain tumor.

Malignant (cancerous) tumors grow more rapidly, tend to metastasize, and usually cause death unless growth can be controlled.



- ✓ *Not all tumors are cancerous.*
- ✓ *Different types of cancer behave differently.*

Cancer cells often travel to other parts of the body where they begin to grow and replace normal tissue. This process is called metastasis. It occurs as the cancer cells get into the bloodstream or lymph vessels of our body. The immune system seems to play a role in the development and spread of cancer. When the immune system is intact, isolated cancer cells will usually be detected and removed from the body. When the immune system is impaired as in people with immunodeficiency diseases, people with organ transplants who are receiving immuno-suppressant drugs, or in AIDS, there is usually an increase in cancer incidence.

Different types of cancer behave very differently. For example, lung cancer and breast cancer are very different diseases. They grow at different rates and respond to different treatments. That is why people with cancer need treatment that is specific to their particular kind of cancer.

3.2.1 Causes of Cancer

Normal cells transform into cancer cells because of damage to DNA. People can inherit damaged DNA, which accounts for inherited cancers. Many times though, a person's DNA becomes damaged by exposure to something toxic in the environment such as chemicals, radiation or viruses.



3.2.2 Risk factors of cancers

Most cancers have multiple causes and risk factors. Risk factors include a person's age, sex and family medical history. Many cancers are associated with lifestyle risk factors such as smoking, dietary factors and alcohol consumption. Smoking alone causes one-third of all cancer deaths. Research shows that about one-third of all cancer deaths are related to dietary factors and lack of physical activity in adulthood. Others are linked to chemical and environmental agents.

- Heredity - Certain types of cancers run in the family such as breast cancer and cervical cancer.
- Carcinogens – A carcinogen is an agent capable of causing cancer. This may be a chemical, an environmental agent, radiation and viruses. Effects of carcinogenic agents usually depend on the dose or amount of exposure: the larger the dose or the longer the exposure, greater risk of cancer.
- Chemicals
 - Polycyclic hydrocarbons are chemicals found in cigarette smoke, industrial agents, or in food such as smoked foods. Polycyclic hydrocarbons are also produced from animal fat in the process of broiling meats and are present in smoked meats and fish.
 - Aflatoxin is found in peanuts and peanut butter. Others include benzopyrene, nitrosamines, and a lot more.
 - Benzopyrene is produced when meat and fish are charcoal broiled or smoked (e.g. tinapa or smoked fish). Avoid eating burned food and eat smoked foods in moderation. This chemical is also produced when food is fried in fat that has been reused repeatedly.
 - Nitrosamines are powerful carcinogens used as preservatives in foods like tocino, longganisa, bacon and hotdog. Formation of nitrosamines may be inhibited by the presence of antioxidants such as Vitamin C in the stomach.
- Environmental Agents
 - Radiation - Radiation can also cause cancer including ultraviolet rays from sunlight, x-rays, radioactive chemicals and other forms of radiation.
 - Viruses - A virus can enter a host cell and cause cancer. This is found in cervical cancer (human papilloma virus), liver cancer (hepatitis B virus), certain leukemias, lymphoma and nasopharyngeal cancer (Epstein-Barr virus).



Having a risk factor for cancer means that a person is more likely to develop the disease at some point in his/her life. However, having one or more risk factors does not necessarily mean that a person will get cancer. Some people with one or more risk factors never develop the disease, while other people who do develop cancer have no apparent risk factors. This has a lot to do with a person's immune system.



Different kinds of cancer have different risk factors. Some of the major risk factors associated with particular types of cancer are shown in Table 1.11.

Table 1.11 Types of cancers and their risk factors

Cancer	Risk Factors
Oral cancer	<ul style="list-style-type: none">• Tobacco use (smoking cigarettes, cigars, pipe, chewing tobacco)• Excessive alcohol use• Chronic irritation (ill-fitting dentures)• Vitamin A deficiency
Laryngeal cancer	<ul style="list-style-type: none">• Tobacco use (smoking cigarettes, cigars, pipe, chewing tobacco)• Poor nutrition• Alcohol• Occupational exposure to wood dust and paint fumes• Common in males more than 60 years old
Esophageal cancer	<ul style="list-style-type: none">• Tobacco use (smoking cigarettes, cigars, pipe, chewing tobacco)• Alcohol• Diet of low in fruits and vegetables• More common in men
Colonic cancer	<ul style="list-style-type: none">• Personal/ family history of polyps• High fat diet and/or low fiber diet• Personal history of ulcerative colitis• Age more than 50 years
Lung cancer	<ul style="list-style-type: none">• Tobacco use (smoking cigarettes, cigars, pipe, chewing tobacco, snuff, passive smoking)• Radiation exposure
Breast cancer	<ul style="list-style-type: none">• Early menarche / late menopause• Changes in hormone levels throughout life such as age at first menstruation, number of pregnancies and age at menopause• High fat diet• Obesity• Physical inactivity• Alcohol• Family history of breast cancer



Cancer	Risk Factors
Liver Cancer	<ul style="list-style-type: none"> • Certain types of viral hepatitis • Liver cirrhosis • Long-term exposure to aflatoxin
Renal cancer	<ul style="list-style-type: none"> • Tobacco use (smoking cigarettes, cigars, pipe, chewing tobacco) • Obesity • Occupational exposure to asbestos and organic solvents • More common to 50-70 years old
Bladder cancer	<ul style="list-style-type: none"> • Tobacco use (smoking cigarettes, cigars, pipe, chewing tobacco) • Occupational exposure to dyes and solvents • Chronic bladder inflammation
Cervical cancer	<ul style="list-style-type: none"> • Tobacco use (smoking cigarettes, cigars, pipe, chewing tobacco) • Human papilloma virus infection • Chlamydia infection • Diet of low in fruits and vegetables • Family history of cervical cancer
Uterine/ endometrial cancer	<ul style="list-style-type: none"> • Estrogen replacement therapy • Early menarche / late menopause • Age more than 50 years
Skin cancer	<ul style="list-style-type: none"> • Unprotected exposure to strong sunlight • Fair complexion • Occupational exposure



Prevention of Cancers

- Promote smoking cessation
 - Quit smoking for active smokers.
 - Prevent passive smoking.
 - Advise smokers not to smoke inside living areas and workplaces to prevent exposure of others to second-hand smoke.
 - Promote smoke-free environment
- Promote proper nutrition
 - Increase intake of dietary fiber - Eat more leafy green and yellow vegetables, fruits and unrefined cereals.
 - Beta-carotene, vitamins A, C, E and dietary fiber may be potential anti-cancer substances.
 - Eat less fat and fatty foods.
 - Limit consumption of smoked, charcoal-broiled, salt-cured, and salt-pickled foods.
 - Avoid moldy foods.
- Maintain normal weight through proper nutrition and physical activity and exercise.
- Drink alcoholic beverages in moderation.
- Early diagnosis and prompt treatment - The sooner a cancer is diagnosed and treatment begins, the better the chances of living longer and enjoying a better quality of life.
- Avoid intravenous drug abuse and cocaine.

3.3 Diabetes mellitus

Diabetes mellitus is not a single disease. It is a genetically and clinically heterogeneous group of metabolic disorders characterized by glucose intolerance with hyperglycemia present at time of diagnosis.

Diabetes mellitus is one of the leading causes of disability in persons over 45 years old. More than half of diabetic persons will die of coronary heart disease. Coronary artery disease tends to occur at an earlier age and with greater severity in persons with diabetes. It also increases the risk of dying of cardiovascular disease like heart attack or stroke among women.

3.3.1 Causes of diabetes

Diabetes mellitus is caused by an interaction between two factors: genetic predisposition and lifestyle/environment factors (obesity, nutrition, lack of exercise).



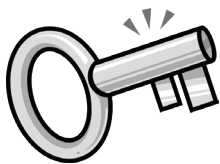
Specific causes depend on the type of diabetes.

- Type I diabetes is insulin-dependent diabetes mellitus (IDDM) – characterized by absolute lack of insulin due to damaged pancreas, prone to develop ketosis, and dependent on insulin injections. Other causes may be genetic, environment, or may be acquired due to viruses (e.g. mumps, congenital rubella) and chemical toxins (e.g. nitrosamines).
- Type II is non- insulin dependent diabetes mellitus (NIDDM) – NIDDM is more common, occurring in about 90-95% of all persons with diabetes. It is also more preventable because it is associated with obesity and diet. It is characterized by fasting hyperglycemia despite availability of insulin. Possible causes include impaired insulin secretion, peripheral insulin resistance and increased hepatic glucose production. It usually occurs in older and overweight persons (about 80%).



3.3.2 Risk factors of diabetes

- Family history of diabetes (i.e., parents or siblings with diabetes)
- Overweight (BMI 23kg/m²) and obesity (BMI > 30kg/m²)
- Lack of physical activity
- Hypertension
- HDL cholesterol < 35 mg/dl (0.90 mmol/L) and/or triglyceride level > 250 mg/dl (2.82 mmol/L)
- History of Gestational Diabetes Mellitus (GDM) or delivery of a baby weighing 9 lbs (4.0 Kgs)
- Previously identified to have Impaired Glucose Tolerance (IGT)



Prevention of diabetes

- Maintain normal weight and prevent overweight/obesity
- Promote proper nutrition - - Eat more dietary fiber, reduce salt and fat intake, avoid simple sugars like cakes and pastries; avoid junk foods.
- Promote regular physical activity and exercise to prevent obesity, hypercholesterolemia and enhance insulin action in the body
- Promote smoking cessation for active smokers and prevent exposure to second-hand smoke. Smoking among diabetics increases risk for heart attack and stroke.



3.4 Chronic respiratory diseases

Chronic respiratory diseases include Chronic Obstructive Pulmonary Disease (COPD) and asthma. COPD is a disease state characterized by airflow limitation that is not fully reversible. The airflow limitation is usually both progressive and associated with an abnormal inflammatory response of the lungs to noxious particles or gases. The lungs undergo permanent structural change, which leads to varying degrees of hypoxemia (decreased partial pressure of oxygen in blood) and hypercapnea elevated level of carbon dioxide in the blood). This explains the breathlessness and frequent cough associated with COPD.

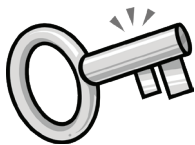


Asthma is a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role. Chronic inflammation causes an associated increase in airway hyper-responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness and coughing, particularly at night or in the early morning. These episodes are usually associated with widespread but variable airflow obstruction that is often reversible either spontaneously or with treatment.

3.4.1 Causes and Risk Factors of COPD and asthma

COPD is usually due to chronic bronchitis and emphysema, both of which are due to cigarette smoking.

Asthma development has both a genetic and environmental component. Genetic predisposition includes atopy or allergy, airway hyper-responsiveness, gender, race or ethnicity. Environmental factors include indoor and outdoor allergens, occupational sensitizers, tobacco smoke, air pollution, respiratory infections, parasitic infections, socioeconomic factors, family size, diet and drugs.



Prevention of COPD and Asthma

- Promote smoking cessation among individuals with COPD and asthma
- Promote smoke-free environment
- Recognize triggers that exacerbate asthma such as irritant gases and smoke, house dust mite found in pillows, mattresses, carpets; respiratory infection, inhaled allergens, weather changes, cold air, exercise, certain foods/drugs.



4. Key Areas for the Primary Prevention of the Major NCDs

A more cost-effective approach to the prevention and control of major NCDs is the prevention of the common risk factors. By promoting proper nutrition, we prevent at least four major NCDs. By not smoking, we prevent at least 40 diseases and 20 types of cancers. With moderate alcohol drinking, we prevent hepatic cancer and cardiovascular disease. It also contributes to central obesity further increasing cardiovascular risk. The presence of diabetes mellitus and hypertension also worsens the risk for cardiovascular morbidity and mortality. Stress, although not mentioned in the list of risk factors, can also contribute significantly to some of these major NCDs.

4.1 *Promote proper nutrition*

- Limit intake of fatty, salty and preserved foods
- Increase intake of vegetables and fruits
- Avoid high caloric low-nutrient value food like junk food, instant noodles, soft drinks
- Start developing healthy habits in children

4.2 **Encourage more physical activity and exercise**

- Moderate physical activity of at least 30 minutes for most days
- Integrate physical activity and exercise into regular day-to-day activities
- Promote walking as one form of exercise that is possible for all including older persons and persons with cardiovascular disease

4.3 **Promote a smoke-free individuals and environment**

- Smoking cessation for active smokers to reduce risk
- Prohibit smoking inside living areas, houses and closed areas
- Avoid smoke-filled places
- Advocate for implementation of policies that support smoke-free environment
- Support policies/ordinances/laws that limit access of cigarettes to children and youth

4.4 **Discourage excessive alcohol drinking**

The practice of excessive alcohol drinking is not encouraged considering the increasing deaths due to vehicular accidents and effects on the liver.



4.5 Manage stress effectively

Managing stress among individuals and population is important since chronic stress or pressure is considered another risk factor that may lead to other unhealthy practices leading to NCDs.

4.6 Regular health check-up for early diagnosis and prompt treatment

Early detection of presence of risk factors and diseases is essential for prompt treatment and avoidance of complications.



Key Areas for Primary Prevention

1. Promote proper nutrition
2. Encourage more physical activity and exercise
3. Promote a smoke-free individuals and environment
4. Discourage excessive alcohol drinking
5. Manage stress effectively
6. Regular health check-up for early diagnosis and prompt treatment

5. WHO Western Pacific Regional Action Plan for NCD

WHO Western Pacific Region envisions a region free of avoidable NCD deaths and disability. To achieve this, the Western Pacific Regional Action Plan is focused on practical, cost-effective and evidence-based interventions that Member States can adopt to achieve a reduction in NCD risk factor prevalence, and NCD mortality and morbidity.


The Western Pacific Regional Action Plan is built around **eight key principles**:

1. People-centered health care – Interventions and initiatives must adhere to the principles and values outlined in the People-Centred Health Care policy framework of the Western Pacific Region.
2. Cultural relevance – Policies, programmes and services must respect and take into consideration the specific cultures and the diversity of populations within the Region.
3. Focused on reducing inequities – The Regional Action Plan recognizes that the burden of chronic diseases is disproportionately borne within countries, by the poorer and less advantaged sectors, and across countries, by those at the lower stages of economic development. Thus, interventions must address the need to reduce inequities across and within countries by considering the social determinants of health to enable the attainment of healthy outcomes by all.
4. Encompassing the entire care continuum – The Regional Action Plan affirms the importance of a balanced approach to NCDs, beginning with prevention and health promotion, lifestyle interventions to modify risk factors, screening, clinical interventions for high-risk individuals and groups, all the way through to chronic care, rehabilitation and palliation. This implies that the active participation of the entire health



system is fundamental to creating impacts on population health.

5. Involving the whole of society – Many of the critical interventions to prevent and control chronic diseases lie outside of the direct sphere of influence of the health sector. Thus, multisectoral partnerships are essential to successful NCD prevention and control.
6. Integral to health systems strengthening – Noncommunicable diseases impact on the health care system not only in terms of increased service utilization and the associated costs, but also in the nature of the demands on service delivery to meet the needs of patients requiring long-term care. Health systems, in general, are designed to provide acute illness care, not chronic care. As such, most health systems fall short in the following areas: (a) the patient’s responsibility and role in disease management are not emphasized; (b) follow-up is sporadic; (c) community services tend to be ignored; and (d) prevention is underutilized and underemphasized.



8 KEY PRINCIPLES

1. People-centered health care
2. Cultural relevance
3. Focused on reducing inequities
4. Encompassing the entire care continuum
5. Involving the whole society
6. Integral to health systems strengthening
7. Consistent with the global action plan
8. Flexibility through a phased approach

As the NCD burden grows, ensuring that health systems can adequately address NCDs becomes integral to augmenting the capacity of health systems to meet evolving health challenges. For this to occur, integrating NCD prevention and management into primary health care is essential.

7. Consistent with the Global Action Plan, and supportive of existing regional strategies and action plans – Recommended actions are in line with the objectives of the Global Action Plan, and with the strategies and principles of previous regional plans. This plan utilizes the best available science in selecting strategic actions while acknowledging the current limitations of research into the effectiveness of NCD interventions.
8. Flexibility through a phased approach – Recognizing that countries and areas are at different stages of capacity for NCD prevention and control, the Regional Action Plan aligns its strategic actions along a continuum consistent with the NCD causation pathway. This phased approach allows countries to intervene at different points along the continuum depending on their local situation, capacity and resources.

Strategic Approach

The Western Pacific Regional Action Plan for NCD utilizes a comprehensive approach that simultaneously seeks to effect change at three levels:

1. At the environmental level, through policy and regulatory interventions;
2. At the level of common and intermediate risk factors, through population-based lifestyle interventions; and



3. At the level of early and established disease, through clinical interventions targeted at the entire population (screening), high-risk individuals (risk factor modification) and persons with established disease (clinical management).

To support change in these three levels, additional actions are needed in the following areas: (1) advocacy; (2) research, surveillance and evaluation; (3) leadership, multisectoral partnerships and community mobilization; and (4) health systems strengthening.

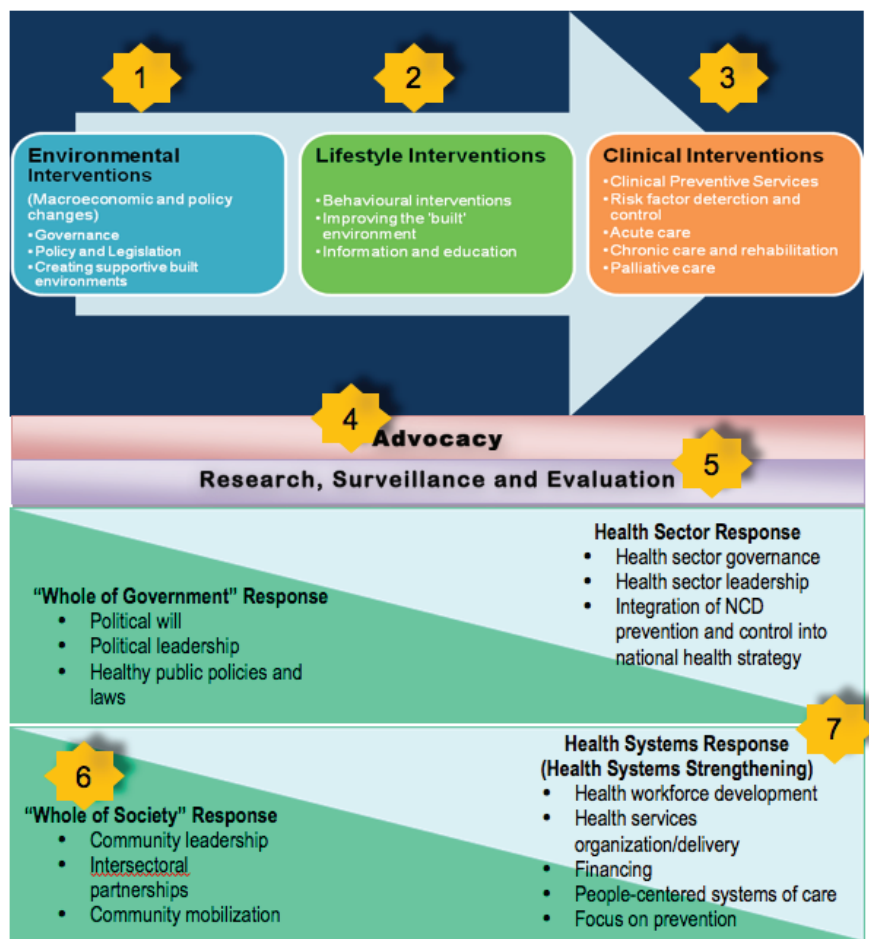


Figure 1-5. WHO WPRO Strategic approach to NCD Prevention and Control



In summary, the approach recognizes seven strategic action areas along an intervention pathway that corresponds to the NCD causation pathway. To read more about the WHO Western Pacific Regional Plan of Action on NCD, see Appendix B of the DOH Manual of Operations on Prevention and Control of Chronic Lifestyle-Related Noncommunicable Diseases, 2009.

6. Prevention and Control of Chronic Lifestyle-Related Noncommunicable Diseases (Integrated NCD Prevention and Control Program Framework)

The design and implementation of the Integrated NCD Prevention and Control Program are guided by the following policy and strategic framework, which contains: vision, mission, goal, objectives, guiding principles, policy directions and key strategies.

Vision : Improved quality of life for all Filipinos

Mission: Ensure that quality prevention and control of NCD services are accessible to all Filipinos especially to the vulnerable and at-risk population

Goal: Reduce the burden of disease and death due to NCDs

Objectives:

1. Reduce the exposure of population to risks related to NCDs
2. Increase the proportion of NCD cases given appropriate treatment and care

Guiding Principles:

The national policy on NCD prevention and control possesses the following key characteristics and guiding principles:

(1) *It uses the integrated approach.* NCD approaches should cover a multitude of relevant risk factors which include tobacco use, unhealthy diet, physical inactivity, alcohol use, hypertension, high blood sugar, overweight and obesity, and impaired lung function. Similarly, NCD activities should be linked to other health programs and health-related initiatives to more effectively address NCDs and their social, and economic determinants.

(2) *It provides comprehensive services along the continuum of care.* Health care settings should provide complementary services that collectively span the care continuum. Package of services on the following should be made available or accessible: (a) prevention and health promotion; (b) lifestyle interventions to modify risk factors; (c) screening; (d) clinical interventions for high-risk individuals and groups; (e) rehabilitation; and (f) palliation. System for referral to other health facilities should be in place to facilitate access and ensure continuity of care across health facilities at various levels.



(3) *It promotes the primary health care approach and encourages community-based implementation.* Appropriate services, particularly on primary prevention, should be made available in primary health care facilities, where individuals and communities are often initially able to establish contact with the health system. Community participation should also be sought to strengthen awareness on NCD prevention and control and to provide a social environment conducive for behavior change towards healthy lifestyle.

(4) *It addresses equity concerns.* Non-communicable diseases often affect the poor, who are more exposed to risks and have less access to health services. NCDs hinder economic development and can trap individuals, families, and communities in the vicious cycle of poverty and poor health. Planned interventions should therefore address the needs of the most vulnerable and marginalized sectors, to give them a fairer chance to escape from the clutches of poverty and exclusion and be able to cultivate their potentials and realize more fully their human development.

(5) *It provides continuity of services throughout the human life cycle.* Risk factors accumulate from fetal life through adulthood. As such, NCD services catering to various age groups and addressing age-related needs should be made available. Healthy habits start early, and should be encouraged during childhood and adolescence. Maternal conditions (e.g. low birth weight) and social conditions (e.g. adverse childhood experiences) have been associated with the development of NCDs in later life; programs and services that address these risks should be strengthened.

(6) *It encourages evidence-based program management.* Research should be encouraged to provide the knowledge base for the development of appropriate policies and actions on NCDs. Surveillance, monitoring, and evaluation should be institutionalized, as data from these activities contribute to sound policy formulation, planning of actions, designing interventions and making appropriate decisions concerning NCD-related issues and concerns. Capability of stakeholders to collect, analyze, disseminate, and utilize evidences must be enhanced.

(7) *It encourages partnerships and advocates for whole-of-government and whole-of-society approaches.* Many of the critical interventions to prevent and control non-communicable diseases lie outside of the direct sphere of influence of the health sector. Thus, in addition to collaborative undertakings within the health sector, multi-sectoral partnerships are essential. Working in partnership ensures synergies, avoids overlapping and duplication of activities, and prevents unnecessary competition.

(8) *It ensures sustainability.* NCD programs should work for sustained funding and institutionalized roles of stakeholders within and outside the health sector. Commitment of stakeholders to the national plan of action on NCDs should be strengthened. Monitoring and evaluation mechanisms should be put in place to ensure effective implementation and planning for next actions.



Key Local Strategies:

1. *Localize Healthy Public Policy.* Supportive laws to healthy lifestyle have been passed; however, implementation and compliance to these laws is weak. Policies from the national level hardly reach the localities, and appreciation of the provisions is rather low. Laws and policies need to be localized and adopted according to the specific needs and requirements of the different localities. Review and discussion of the provisions of these laws and policies are to be encouraged and supported.

Areas for consideration for local policy/legislation include the following: (1) declaration of public places as non-smoking areas, (2) prohibition in the sales of cigarettes near schools following certain parameters provided for in the law; (3) local restaurants and street food vendors to serve healthy food to their clients; (4) mandating school health boards to prevent the selling of food low in nutritive value, e.g. soft drinks and junk food in schools; (5) requiring all local government agencies to establish regular physical exercise among the employees; and (6) declaring a certain day/week/month of the year to celebrate Healthy Lifestyle to raise the consciousness of the public and sustain their interest in supporting and practicing healthy lifestyles.

2. *Build Coalition for NCD Prevention and Control.* The prevention and reduction of NCDs requires interventions beyond the health sector. Coalition among concerned sectors must be established to ensure a unified and well-coordinated action. The participation of the education, social welfare, labor both formal and informal, agriculture and industrial sectors is critical if NCD prevention and reduction is to be approached on a holistic and comprehensive manner. Alliance between the government and the private sectors has to be fostered for better complementation of inputs and resources. At the national level, the Coalition for c evolved from among groups and institutions bound by common purpose and dedication to address NCD mortality and morbidities in the country.
3. *Enhance Community Participation.* The promotion of healthy lifestyle is heavily anchored on the participation and involvement of community members. Enhancing community participation is aimed at making the community members more receptive to changing their lifestyles. It could make them better advocates and supporters for others to follow. They can also become a source of financial support or other resources as they become involved in various campaigns and activities. At the end, the community members will be instrumental in bringing more members to avail of services, thus begin to develop and adopt new healthy lifestyle and practices.
4. *Create a Supportive Organizational and Physical Environment.* NCD prevention and control services are traditionally delivered through the network of public health facilities. A supportive organizational environment requires not only strengthening the capacities of the network public health facilities but also expanding the service delivery points to other health units in the private sector and in other institutions like that of the schools and corporations. Likewise, healthy lifestyle promotion must be integrated into



the existing programs and activities of the LGUs, the church, academe and the community. Meetings and assemblies of formal and informal groups alike (e.g. professional societies, interest groups, informal sector – transport associations, market vendors, street vendors, etc.) can serve as delivery points for promotive and preventive care. Correspondingly, a supportive physical environment must also be put in place. These may come in different forms as in providing a space for staff or community members to do their physical exercise or physical activity (e.g. sports tournament), decongesting walk pavements to encourage the populace take a walk rather than ride, ensuring continuous traffic flow to ensure safety of pedestrians, providing lot and space for planting fruits and vegetables, and others.

5. *Intensify Health Education and Public Information.* Prevention of NCDs banks largely on the success of changing poor health habits and practices into healthy lifestyle. Health promotion efforts will take various forms in order to effect change in lifestyle and behavior. These include: (a) information, education and communication (IEC) intervention measures both for the individuals and the general public, (b) social mobilization that include the generation of participation and involvement of the community, service providers, program managers and other partners in making key decisions, assessment and planning, implementation and monitoring of NCD related efforts, and (c) advocacy among mandated agencies or institutions and concerned officials for direction and support. Key messages appropriate for each target group must be defined and geared to changes in behavior that are desired.
6. *Strengthen Clinical Preventive Services.* Clinical services must complement health promotion efforts. Critical to NCD prevention and control is the identification of the major common risk factor/s that exposes the individuals or groups of individuals to increased likelihood of developing NCDs. It is imperative that an assessment and screening of these risks in individuals and communities must be done in every opportunity using a simple tool. Results of the risk assessment must be used to guide the proper selection of appropriate lifestyle modification interventions for the concerned individuals and groups. Lifestyle modification interventions (which may come in different forms) must comply with the set standards and protocols to ensure quality of service provided to the clients. In this regard, competencies of service providers along the delivery of these standard services must be developed while appropriate logistics/ supplies, equipment and facilities must be in place. Critical to the strengthening of clinical prevention is the identification and referral of individuals needing advanced or more specialized care to a clinic or facility with established expertise in providing said management, treatment and care. Referral system be established and strengthened to ensure continuum of care and support of those needing secondary or tertiary care.
7. *Institutionalize Planning for Promotion of Healthy Lifestyle.* Assessment and Planning is a precursor to an effective implementation of NCD prevention and control program at the local level. Every locality is encouraged to undertake their own assessment of the current situation of NCDs in their area and identify the major risk factors exposing their population to NCD diseases. This is critical in the selection of interventions in response to their identified needs and particular situations. The plan for Healthy



Lifestyle must be integrated into the current development plan of the LGUs, and inputted into their Philippine Investment Plan for Health (PIPH) in F1 areas in order that efforts for HL will gain equitable support from various investments. LGUs must be provided with a guide on how to assess NCD-related issues and planning parameters to consider in selecting and designing appropriate interventions.

8. *Expand Capability Building.* Training on Healthy Lifestyle has been undertaken nationwide in the past. The coverage however was limited only to the network of public health facility staff. There is a need that this training be expanded to other groups of service providers outside the public health network and be offered to private practitioners those working in NGOs, church, private and public schools and the corporate institutions. Training will be expanded to include building competencies not only of service providers but also of program managers on other aspects of health promotion, particularly advocacy, social mobilization and communication. An advanced training on Course for Program Managers on NCD Prevention and Control has been developed and provided to the regional NCD Program Coordinators and Health Education Program Officers (HEPOs). This training needs to be cascaded down to the local levels to enable them become better managers and advocates for NCD prevention and control.
9. *Reinstall Supervision.* Supervisory system needs to be reinstalled at each locality to ensure that the delivery of NCD prevention and control services follow the desired protocols and standards. Supervision must be purposive, planned in advance and the results of which are properly documented and tracked. Supervision calls for on-site training, problem solving and monitoring by the health facility supervisor on a regular basis. This component requires the supervision to be done in the context of enabling spirit rather than as a fault-finding mission. It requires the identification of actions, reaching an agreement with the supervisee what need to be done, and documenting these actions. Guide of supervision for the delivery of NCD prevention and control services has been initiated under the SS Certification Supervisory Package. LGU supervisors must be given special orientation on the said package.
10. *Establish Financing Schemes.* The implementation of NCD prevention and control measures requires substantial amount of resources. Financing options must be explored to sustain support for delivery of NCD services, promotion and other supportive mechanisms. Three tracks will be pursued to improve financing for healthy promotion activities. First is advocate for LGUs to increase budget allocation for NCD prevention in the health department and in other government offices (e.g. DILG, DSWD, LCEs' office, etc.) from the province to the barangay level. Second, entail mobilization of resources from the private sector, particularly the professional societies (e.g. church, corporations, clubs/ associations, and other NGOs), as well as contributions from the community, and external sources. Third, explore PhilHealth coverage of selected NCD prevention and control services, including mobilization of capitation funds for healthy lifestyle promotion.
11. *Install Regulatory Mechanisms.* Advocacy must be undertaken to prompt LGUs designate offices or organizations accountable for instilling compliance to national laws and policies related to NCD



prevention and control. More importantly, the political will of local chief executives to adopt and implement the laws and policies must be harnessed. Officials and staff from these duly designated offices must be provided with proper orientation on the laws and policies, and should be helped in developing their guidelines and procedures for monitoring compliance. Prominent officials or celebrities can be tapped to champion the cause of NCD prevention and control. The role of BFAD in ensuring healthy food products must be strengthened, and support of sanitary inspectors must be maximized. Support of the various agencies and participation of NGOs in monitoring compliance must be mobilized.

12. *Unify Monitoring and Evaluation Efforts.* Just as assessment and planning is a precursor to an effective NCD intervention implementation, monitoring and evaluation is equally vital in ensuring that intervention measures are properly implemented, regularly enhanced and focused to their targeted beneficiaries. Monitoring NCD status and progress of interventions as well as evaluating the results of initiatives are helpful in facilitating and redirecting focus and attention. Surveillance is one component of NCD monitoring and evaluation where there is a pro-active identification of people at risk to NCDs. This requires coordinated efforts between community and the implementing agencies in a given locality and must be strongly linked with higher level of administration. LGUs must be oriented on surveillance systems and monitoring efforts must be aligned with the ME3 system (monitoring for equity, effectiveness and efficiency) being implemented by the Department of Health.

Roles of Health Workers in NCD Prevention and Control

The health workers play a central role in operationalizing the framework of NCD prevention and control. The expected roles and functions are described below.

Table 1.12 Expected roles of health workers in NCD prevention and control

	Policy development and advocacy	Program implementation	Governance and financing
National Level - Department of Health	<ul style="list-style-type: none"> • Set overall policy direction; • Formulate National Strategic Plan of Action; • Advocate for the drafting and passage of bills/laws; • Identify agenda for research and policy actions; 	<ul style="list-style-type: none"> • Provide technical assistance to the CHDs, LGUs and other partners: <ul style="list-style-type: none"> o Develop standards and protocols to guide the program implementation; 	<ul style="list-style-type: none"> • Design and advocate financing mechanisms to help LGUs sustain delivery of the NCD prevention and control services; • Ensure compliance of LGUs to the provisions of passed laws and



	Policy development and advocacy	Program implementation	Governance and financing
National Level - Department of Health	<ul style="list-style-type: none"> • Disseminate policies, guidelines and standards; 	<ul style="list-style-type: none"> o Design and provide training to address capability gaps; o Develop prototypes of IEC and advocacy materials 	<ul style="list-style-type: none"> legislations, policies, standards and protocols; • Coordinate with international development partners and other countries for technical updates on NCD prevention and control and takes responsibility for adoption or localization of these in the country; • Collaborate with donor agencies (international and local) to harmonize investments and assistance; • Establish links with the other government agencies and private sector establishments and corporations including professional societies, the academe and mobilize their support and participation; • Develop guides on supervision • Develop guide in installing surveillance system • Conduct monitoring and evaluation



	Policy development and advocacy	Program implementation	Governance and financing
Regional Level - Centers for Health and Development	<ul style="list-style-type: none">• Promote and advocate adoption of the National Policy on NCD Prevention and Control• Ensure implementation of Implementing Rules and Regulations (IRR), policies and guidelines issued at the national and regional level	<ul style="list-style-type: none">• Provide technical assistance to the LGUs on NCD prevention and control• Conduct region-wide IEC advocacy activities for HL/NCD prevention and control• Conduct training on NCD prevention and control	<ul style="list-style-type: none">• Upgrade and maintain operations of regional medical centers and retained DOH hospital as referral centers for advanced management and treatment of NCD cases• Establish links with the stakeholders region wide for NCD prevention and control to mobilize their support and participation• Provide financial and logistics augmentation to LGUs on NCD prevention and control• Conduct regular monitoring and evaluation



	Policy development and advocacy	Program implementation	Governance and financing
Provincial Government	<ul style="list-style-type: none"> • Formulate Provincial Integrated NCD Prevention and Control Policy Framework and Strategic Plan; • Help enforce national laws and policies in support to NCD reduction; 	<ul style="list-style-type: none"> • Adopt and implement the Integrated NCD Prevention and Control Program for the whole province; • Provide technical assistance to municipal/city levels in implementing NCD prevention and control measures; • Conduct baseline survey in partnership with the city/municipal governments to establish the status of NCD in the whole province; • Upgrade provincial and district hospitals as referral centers for higher level of care needed in management and treatment of NCDs; • Train/orient municipal/city health service providers on healthy lifestyle promotion/ NCD prevention and control; 	<ul style="list-style-type: none"> • Conduct regular supervision of municipal/city level service providers in the delivery of NCD preventive and control services; • Provide financial and logistics augmentation as able; • Continue to support PhilHealth enrollment and advocate adoption of other financing mechanism as potential source of income in support to NCD prevention and control; • Establish links with stakeholders province-wide for NCD prevention and control to mobilize their support and participation; • Monitor and evaluate progress and status in NCD Plan implementation and outcomes of efforts.



	Policy development and advocacy	Program implementation	Governance and financing
City /Municipal Government	<ul style="list-style-type: none">• Adopt and formulate their own Municipal/ City Integrated NCD Prevention and Control Program Policy and Strategic Framework;• Formulate local policies and ordinances to provide a supportive policy environment for the implementation of NCD prevention and control;• Enforce compliance to national laws and policies;	<ul style="list-style-type: none">• Coordinate with the provincial, regional and national levels for technical assistance required; and submits necessary reports on NCDs;• Conduct baseline survey or rapid assessment to establish NCD status in their respective localities using standard existing protocols• Establish and operates a two-way referral scheme to ensure patients needing higher level of care and services to access them;• Establish links with barangays and communities for social mobilization and participation• Provide packages of services /interventions at the municipal level to prevent and control NCDs.	<ul style="list-style-type: none">• Deploy staff, upgrade facilities and equip them to deliver quality NCD prevention and control services;• Provide regular budget allocation for NCD prevention and control;• Comply with the accreditation and licensing requirements of PhilHealth and DOH to allow facilities eligible for PhilHealth reimbursements;• Design, campaign and operate local financing schemes in support to NCD prevention and control;• Continue to enroll indigent members to PhilHealth to improve access to NCD services;• Establish and implement functional surveillance system for NCDs;• Conduct monitoring and evaluation;



	Policy development and advocacy	Program implementation	Governance and financing
Barangay and Community	<ul style="list-style-type: none"> • Promulgate ordinances and resolutions to support NCD prevention and control; • Enforce compliance of national laws and policies; 	<ul style="list-style-type: none"> • Provide packages of services /interventions at the barangay / community level to prevent and control NCDs. • Organize community support groups for NCD patients: diabetes club, cardiovascular club, etc. • Continue to provide IEC among household members on healthy lifestyle; 	<ul style="list-style-type: none"> • Provide budget allocation for essential drugs/ medicines to meet NCD gaps of community members; • Explore possibilities for local health financing in support to NCD cases; • Identify key community leaders to participate in the planning and monitoring of relevant NCD prevention and control measures; • Establish a community-based surveillance system on NCDs; • Help establish and update the registries of people with NCDs;



Prevention of Hypertension

- ✓ Proper nutrition – reduce salt and fat intake
- ✓ Prevent overweight and obesity – Weight reduction through proper nutrition and increased levels of physical activity and exercise
- ✓ Promote smoking cessation – Tobacco use promotes atherosclerosis that may contribute to hypertension
- ✓ Early diagnosis and prompt treatment - Identify people with risk factors and encourage regular check-ups for possible hypertension and modification of risk factors.

Prevention of Coronary Artery Disease

- ✓ Promote regular physical activity and exercise because these increase HDL, prevent obesity and improve optimum functioning of the heart.
- ✓ Encourage proper nutrition particularly by limiting intake of saturated fats that increase LDL, limiting salt intake and increasing intake of dietary fiber by eating more vegetables, fruits, unrefined cereals and wheat bread.
- ✓ Maintain body weight and prevent obesity through proper nutrition and physical activity/exercise.
- ✓ Promote smoking cessation for active smokers and prevent exposure to second-hand smoke by family members, friends and co-workers of active smokers. Promote a smoke-free environment through advocacy and community mobilization.
- ✓ Early diagnosis, prompt treatment and control of diabetes and hypertension are important since these contribute to the development of coronary artery disease.



Prevention of Stroke

- ✓ Prompt treatment and control of hypertension – Effective treatment of high blood pressure is a key reason for rapid decline in death rates for stroke.
- ✓ Prevent all other risk factors of atherosclerosis.
- ✓ Prevent thrombus formation in rheumatic heart disease and arrhythmias with appropriate medications. These medications are usually taken on a daily basis.
- ✓ Health workers need to remind these persons to take their medications as prescribed.
- ✓ Promote smoking cessation and smoke-free environment.
- ✓ Avoid intravenous drug abuse and cocaine.

Prevention of Cancers

- ✓ Promote smoking cessation
 - Quit smoking for active smokers.
 - Prevent passive smoking.
 - Advise smokers not to smoke inside living areas and workplaces to prevent exposure of others to second-hand smoke.
 - Promote smoke-free environment
- ✓ Promote proper nutrition
 - Increase intake of dietary fiber - Eat more leafy green and yellow vegetables, fruits and unrefined cereals.
 - Beta-carotene, vitamins A, C, E and dietary fiber may be potential anti-cancer substances.
 - Eat less fat and fatty foods.
 - Limit consumption of smoked, charcoal-broiled, salt-cured, and salt-pickled foods.
 - Avoid moldy foods.
- ✓ Maintain normal weight through proper nutrition and physical activity and exercise.
- ✓ Drink alcoholic beverages in moderation.
- ✓ Early diagnosis and prompt treatment - The sooner a cancer is diagnosed and treatment begins, the better the chances of living longer and enjoying a better quality of life.
- ✓ Avoid intravenous drug abuse and cocaine.



Prevention of diabetes

- ✓ Maintain normal weight and prevent overweight/obesity
- ✓ Promote proper nutrition - - Eat more dietary fiber, reduce salt and fat intake, avoid simple sugars like cakes and pastries; avoid junk foods.
- ✓ Promote regular physical activity and exercise to prevent obesity, hypercholesterolemia and enhance insulin action in the body
- ✓ Promote smoking cessation for active smokers and prevent exposure to second-hand smoke. Smoking among diabetics increases risk for heart attack and stroke.

Prevention of COPD and Asthma

- ✓ Promote smoking cessation among individuals with COPD and asthma
- ✓ Promote smoke-free environment
- ✓ Recognize triggers that exacerbate asthma such as irritant gases and smoke, house dust mite found in pillows, mattresses, carpets; respiratory infection, inhaled allergens, weather changes, cold air, exercise, certain foods/drugs.



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