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Pattern and Trend of Medical Admissions of Patients of Chronic Non-Communicable Diseases in Selected Hospitals in Addis Ababa, Ethiopia

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Abstract

Although chronic non-communicable diseases (NCDs) have been of major importance in developed countries for several decades, currently it is becoming recognized as a major public health threats in the developing world too.The increasing NCDs burden is compounded by failure in provision of clear and up-to-date evidence on the burden for key decision makers. The present study is designed to collect retrospective secondary data from selected Government and Private Hospitals in Addis Ababa that offer services to out-patients of NCDs through special referral clinics. The Objective of this research is to depict the patterns and trends of common NCDs in Government and Private Hospitals in Adds Ababa, and provide decision makers with information on the burden of NCDs at health facility level.

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In order to collect retrospective data, four Governments and five Private owned Hospitals in Addis Ababa that offer referral clinic for NCD were selected. Data of NCD out-patients from 2007 to 2011 were considered for present study. Records of cardiovascular diseases, diabetes mellitus, cancer, chronic kidney diseases and chronic pulmonary obstructive diseases including asthma were collected. The data were collected from Hospital registration and patient records anonymously by respective Hospital staff members assigned in the referral clinics.

Records of 46,565 patients were collected and more than 60% data were obtained from TikurAnbessa Specialized Teaching Hospital and International cardiac center. Majority of the clients (77 %) were from urban areas while 23% from rural areas. With regard to gender, 56% of the patients are females and 44% males. As age increases the proportion of patients with NCDs increased and there was a decline after 54 years. Among the patients who were attending outpatient clinics, the vast majority about 40% were patients were with cardiovascular diseases while diabetes and cancer each independently accounts 20% of the proportion. Patients with chronic pulmonary obstructive diseases including asthma, and chronic kidney diseases were 6% and 5%, respectively. Information regarding the status of patients while making follow-up was also collected. It resulted in about 56% of all NCDs out-patients were actively following their health condition by making frequent visit to their respective out-patient referral clinics, about 2% were deceased and 1% referred to other hospitals, about 41.2% of all NCDs patients were found to be drop-out for unknown reasons. This research reveals that NCDs are becoming public health problems in Addis Ababa. Therefore, there is a need for population-based representative survey to quantify the burden with risk factors for policy formulation and interventions against this emerging epidemic. Moreover, further study is recommended to investigate the reasons of patients why they discontinue care & treatment offered at facility level.

Keywords: Chronic Non-Communicable Diseases; Cardiovascular Diseases; Hypertension; Diabetes mellitus; Cancer; Chronic Kidney Diseases; Chronic Pulmonary Obstructive Diseases.

1. Introduction

Non-communicable diseases (NCDs) are chronic conditions that cause death and impaired quality of life. These diseases result from prolonged exposure to causative agents, which are associated with personal behaviors, environmental factors and genetic influence. Non-communicable diseases are the leading cause of functionary impairment and death worldwide. With the modernization of cultures taking place all over the world, the standard of living and lifestyle in many sub-Saharan African countries. Adoption of Western lifestyles has been established as a major cause for the rise in non–communicable diseases in sub-Saharan Africa. The common elements of “Westernization” include a diet higher in calories and fat but lower in fiber and less need to expend energy because of labor-saving devices [1].

The global burden of non-communicable diseases continues to grow; tackling it constitutes one of the major challenges for development in the twenty–first century. Non–communicable diseases, principally cardiovascular diseases, diabetes mellitus, cancers, and chronic respiratory diseases, caused an estimated 36 million deaths in 2008. This figure represents 63% of all deaths globally, with 80% of deaths (29million) occurred in low–and

middle-income countries [2].

In Africa, there are still more deaths from infectious diseases than NCDs. The prevalence of NCDs is actually rising rapidly and is projected to cause almost three-quarters as many deaths as communicable, maternal, neonatal, and nutritional diseases by 2020, and estimated to exceed as the most common causes of death by 2030 [3].

The rapidly increasing burden of these diseases is affecting poor and disadvantaged population disproportionately, contributing to widening health gaps between and within countries. As non-communicable diseases are largely preventable, the number of premature deaths can be greatly reduced through proper intervention programs [4].

Non-communicable diseases have been a neglected area in many low and middle income countries, due to the heavy burden of communicable diseases, and other competing priorities. The current magnitude of NCDs is a reflection of exposure to the risk factors a couple of decades ago. Therefore, it is of great importance to prevent NCD now before the epidemic becomes out of control.

Limited epidemiologic studies indicate that non-communicable diseases are emerging as a major disease burden in Africa. As a result, developing countries in Africa are challenged with a double burden of disease from pre-existing communicable diseases and the emerging NCD epidemic [5].

In sub-Saharan Africa, the increasing NCD burden is compounded by lack of a coherent policy on chronic disease prevention, control, surveillance, and research. Other limitations include failure to provide key decision makers with clear and up-to-date evidence on the burden of NCDs.

There is scarcity of published studies describing the burden of major chronic diseases in sub –Saharan Africa. Quantitative information on the burden of chronic diseases or the epidemiology of risk factors in Ethiopia is scanty and the existing health management information system (HMIS) lacks completeness.

Furthermore, situation analysis on NCD in the country conducted by FMOH & WHO in 2008 showed that the routine health information at health facilities is constrained by lack of completeness and accuracy and consequently it cannot reveal the magnitude, pattern or trend of chronic diseases reliably. Despite the limitations in the HMIS, chronic diseases such as hypertension and diabetes mellitus appear on the list of leading causes of morbidity and mortality at hospitals and regional health bureaus across the country [6].

High blood pressure is the most commonly identified risk factor for CVD among adults [7] globally and forms the basis for the CVD epidemic in SSA [8]. Though there is no compressive nationally representative survey in Ethiopia, different studies have shown that hypertension was found to be the most common CVD risk factor in both rural and urban areas. An epidemiologic study conducted in urban-rural gradient in 2003 showed prevalence rate of 31% in urban Addis Ababa and prevalence of 10% in Rural Butajira [9].

Although hospital morbidity data often give biased information about the magnitude of the disease, they are the

only data available in many developing countries. Based on such data, Rheumatic Heart Disease (RHD) accounts for 12-65% of hospital admissions related to cardiovascular diseases [10, 11]. Hypertensive Heart Disease is the second most common cause of heart failure in Africa. Hospital based studies in Ethiopia have shown that hypertensive heart disease is the second/third most common cause of heart failure as seen in analysis of patients seen in referral clinics of Jimma and Addis Ababa [12,13].

A cross sectional survey of school children on randomly selected government and private schools in rural Butajera and Addis Ababa, Ethiopia, showed a prevalence of 6.4 per 1000 [14,15]. Analysis of patients seen in the main referral hospital of the country (Tikur Anbessa) showed RHD to be the most common cardiovascular disease accounting for 45-50% of follow up cases [16].

A cross sectional study was conducted on adult cardiac patients who visited the follow up clinic in Jimma University over five year period. Among all cardiac patients, 256 (32.8%) were diagnosed to have rheumatic valvular heart diseases [17].

The prevalence of Diabetes mellitus (DM) is also increasing significantly over the last decades. According the International Diabetes Federation (IDF) new estimates, about 8.3% adults, i.e 382 million people have diabetes in 2013 and this number will increase to 592 million in 2035. The majority of people with diabetes are aged between 40-59 years and 80% of them live in low and middle income countries [18].

A retrospective analysis of diabetic admissions in tertiary referral hospitals at Tikur Anbessa and St, Paul's hospitals showed an increased trend diabetic admission from 2005 to 2009. Among a total of 724 admissions from 2005 to 2009, the admission rate serially increased from 7.1% in 2005 to 34.1% in 2009. The study revealed that 10.6% deaths occurred and 28% died of cardiovascular diseases [19]. A ten year Retrospective Study from Gonder, Northern part of Ethiopia showed that an average of both type 1 DM and type 2 DM cases increased by 125% [20].

NCD is the leading cause of death worldwide; diabetes is the 4th cause of death globally [1]. About 5.1 million deaths occurred due to diabetes in 2013. Diabetes cost USD 548 billion in health care spending in 2013. A study on the cost of care of hospitalized Ethiopian diabetic patients admitted at TikurAnbessa Specialized hospital demonstrated that the direct cost of hospitalization of diabetic patients was significantly higher than non diabetic admissions. The study also showed that substantial proportion of the total cost of admission is utilized for treating acute and long term complications [21].

The incidence of cancer is raising in low and middle income countries. In Africa, it is one of the major emerging health problems. According to International Agency for Research on Cancer (IARC), 715,000 new cancer cases and 542,000 cancer deaths occurred in Africa in the year 2008 [22]. Although there is no data on incidence and mortality of cancer in Ethiopia, hospital-based data show that, cancer is now becoming the major health problem in Ethiopia. According to Addis Ababa population based cancer registry at Radiotherapy Center in TikurAnbessa Specialized Hospital, a total of 3907 cancer cases were registered for the year 2012 in Addis Ababa City. Of this, there were 1995 (68.7%) cancer cases in female and 912(31.3%) cancer cases in male. Of

1995 registered cancer cases in females: breast account (34.07%), Cervix (15.83%), leukemia (6.00%), Ovary (5.5%), thyroid (3.8%) etc. On the other hand, of 912 registered cancer cases in male: Leukemia (14.5%), colon (6.6%), prostate (6.5%), Skin (4.9%), breast (4.8%), Lymphoma (4.2%) and all other cancers (47%).

The chronic respiratory diseases mainly include Bronchial Asthma and obstructive pulmonary diseases (COPD). Little was known about bronchial asthma in Ethiopia, it was after mid-1970's that asthma begun to be mentioned as a cause of Hospital outpatient visits and admissions. For example, 4.3% and 1.7% of medical admissions to the Armed force Hospitals and three civilian Hospitals in Addis Ababa were due to asthma, respectively [23]. Another study done few years later showed that asthma was seen in 2.7% of 5900 medical inpatients and 1% of 26,314 out patients demonstrating that asthma became a common cause of morbidity in Addis Ababa [24]. Subsequently larger community based prevalence studies were done among school children in Addis Ababa, Jimma and Gonder [25, 26, 27].The prevalence of asthma in these studies were found to be 2.8 % and 3.8%, respectively.

There were very little prevalence data on the occurrence of chronic obstructive pulmonary disease (COPD) in Ethiopia. Two Hospital admission analyses showed that chronic bronchitis comprised 7% and 4.3% of all the respiratory admissions in the respective hospitals [28, 29].

Like all other chronic non-communicable diseases, data on the prevalence of Chronic Kidney Disease (CKD) and the incidence and prevalence of kidney disease in Ethiopia are not available. However, there are some hospital based studies and observations indicating the causes of CKD and several studies both in hospital and in the community looking at the major risk factors for CKD, namely hypertension and diabetes. Based on some unpublished hospital based studies and estimates: more recent data from TikurAnbessa Hospital, the main teaching hospital of the AAU Medical School, indicate that chronic glomerulonephritis, diabetes and hypertension are the leading causes of CKD. Renal diseases accounted for 1.2-6 % of adult hospital medical admissions in reports from various parts of the country.

Based on global and national situation, Federal Ministry of Health of Ethiopia has recently developed a strategic framework for prevention and control of chronic non-communicable diseases. One of the objectives stated in this strategy is generating empirical evidence on the pattern and trends of the burden of chronic diseases [30].

Management of chronic diseases is limited to the routine health care provision at health facilities especially in hospitals, without any programs that coordinate prevention or clinical care provision. Hospitals run weekly follow-up treatment of patients with specific chronic diseases through special referral clinics/ centers. In the referral clinics, NCDs records are somehow kept better compared to registries in the main outpatient departments.

Although clinic-based studies have their own limitations, the present study is designed to collect retrospective data from selected public and private hospitals that offer services to patients of NCDs through special referral clinics/centers. The main purpose of the study was to depict the patterns and trends of common NCDs in Government and Private Hospitals in Addis Ababa, and provide decision makers with information on the burden

of NCDs at health facility level.

2. Materials and Methods

Government and private owned hospitals in Addis Ababa that offer referral clinic for NCD were purposively selected to collect retrospective data of five years from 2007 to 2011. Hospitals have outpatient specialty clinics where patients are referred for specific chronic disease for follow-up. The source population for the study was all adult patients that are newly registered for NCDs from 2007 to 2011. Sample size was not predetermined as the study population was all source population whose records were available during the data collection period. Intensive orientation on how to fill-in the questionnaire was given to hospital staff members who were involved in the data collection process. Records of cardiovascular diseases, diabetes mellitus, types of cancer, chronic kidney diseases, chronic obstructive pulmonary diseases plus asthma were collected by respective hospital staff members.

2.1 Study sites

The site of the study was in Addis Ababa, the capital city of Ethiopia. Among the available ten Governments run hospitals, the hospitals, which have multiple departments and clinics, and run weekly follow up treatment of patients with specific chronic diseases were selected. These hospitals included:

• Ras Desta Damtew Referral Hospital

• St. Paul Hospital Millennium College

• Tikur Anbessa Specialized Hospital

• Yekatit 12 Hospital

There are also numerous private hospitals that provide same services. Among those hospitals, the well-established ones are selected and below is the list:

• Addis Hiwot Hospital

• Betel Teaching Hospital

• Betezatha Hospital

• International Cardiovascular Hospital,

• St. Gabriel Hospital

2.2 Data Management and Quality Control

Standard data quality control procedures were implemented for each critical stage of the study design and implementation. Depending on the feedback, gained from the pre-test, the questionnaire was further revised and updated. Data was collected by staff members of respective hospital. The data collectors have received orientation on the contents of the questionnaire and the orientation was given by the core research team members. Intensive monitoring and follow-up during data collection were undertaken by staff members of the centre. During this survay, experienced core research team members have technically assisted the data collectors and closely checked completeness, accuracy, clarity and consistency of the data.

The quality of data was further ascertained during the data entry and cleaning process. The senior statisticians strictly supervised the data encoders at EPHI during the data entry period. In order to reduce data entry errors, the data was double entered using SPSS version 16 software. Based on this procedure, the senior statisticians conduct a comparison between the two entries and some corrections were made by the checking responses in the questionnaire. Descriptive analyses were made using the same software.

2.3 Ethical consideration

Ethical clearance was obtained both from Scientific and Ethical Review Office (SERO) of EPHI and from Addis Ababa University Medical Faculty - Institutional Review Board before the commencement of the study. EPHI produced official letter to Addis Ababa Health Bureau (AAHB) and the Bureau in turn sent letter of cooperation to most of the selected hospitals accountable to AAHB. The investigators introduced themselves and requested selected hospitals officials for cooperation by presenting officers letter prepared by AAHB &EPHI. Finally, a verbal consent was obtained from hospital officers and the confidentiality of the data were maintained

3. Results

Based on the study protocol, retrospective secondary data were collected from four government and five private owned hospitals providing outpatient clinic services for NCDs in Addis Ababa. Records of 46,565 patients during the years of 2007 to 2011 were considered and collected. Seventy-seven percent of the clients were from urban while 23% from rural areas. With regard to gender, 56% of the patients were female and 44% male. As age increases the proportion of patients with NCDs increased and there was a decline in proportion after 54 years (Table 1).

Of all the patients who were attending outpatient clinics, the vast majority that accounts 40% are patients with cardiovascular diseases while diabetes and cancer each independently accounted 20% of the proportion (Figure 1).

Figure 2 shows an increasing trend of NCDS from 2007 to 2010 and a relative decline in 2011 was probably related to an introduction of a new integrated OPD diagnosis and attendance tally sheet used to record patient information in hospitals.

As can be seen from Table 2, among outpatients with cardiovascular diseases, about 19% and 15% were with rheumatic and coronary heart diseases, respectively. Cardiovascular diseases are the leading causes of morbidity

and mortality worldwide [1]. Although the etiologic diagnosis could not be obtained from the records, congestive heart failure (CHF) accounted for about 3%; cardiomyopathy, congenital heart disease and ischemic heart disease each accounted about 2%.

The number of cardiovascular cases including hypertension was 20,319. Total number of hypertensive cases was 8843 which is 43.5% of the cases.

Table 1: Background characteristics of out-patients enrolled for treatment of Chronic Non-Communicable Disease between2007 and 2011

Characteristics		Number of cases	Percentage
Name of Hospital	TikurAnbessa Specialized Teaching Hospital	15548	33.4%
	International Cardiac Center	14317	30.7%
	Yekatit 12	6559	14.1%
	St. Gabriel	4252	9.1%
	St. Paulos	2325	5.0%
	RasDesta	1645	3.5%
	Bethel Teaching	850	1.8%
	Addis Hiwot	627	1.3%
	Bethezatha	442	0.9%
	Total	46,565	100.0%
Residential area of the patient	Urban	35043	76.6%
	Rural	10681	23.4%
	Total	45,724	100.0%
Sex of the patient	Male	20420	44.1%
	Female	25904	55.9%
	Total	46324	100.0%
Age category	<15	725	1.6%
	15 – 24	5300	11.4%
	25 – 34	6984	15.0%
	35 – 44	8369	18.0%
	45 – 54	9883	21.3%
	55 – 64	7729	16.6%
	>=65	7432	16.0%
	Total	46,422	100.0%

Hypertension is a major risk factor for variety of cardiovascular diseases, including coronary heart disease, stroke, heart failure, peripheral vascular disease and renal failure. As can be seen from Table 2, among outpatients with cardiovascular diseases nearly 44 % of the patients were found to be hypertensive.

Table 3 depicts of all the patients with diabetes, about 83%, 17% were patients with Type2 and type1 diabetes, respectively. With regard to chronic obstetric pulmonary disease, about 61% of the patients were with asthma while about 39% were cases of chronic obstructive pulmonary disease.

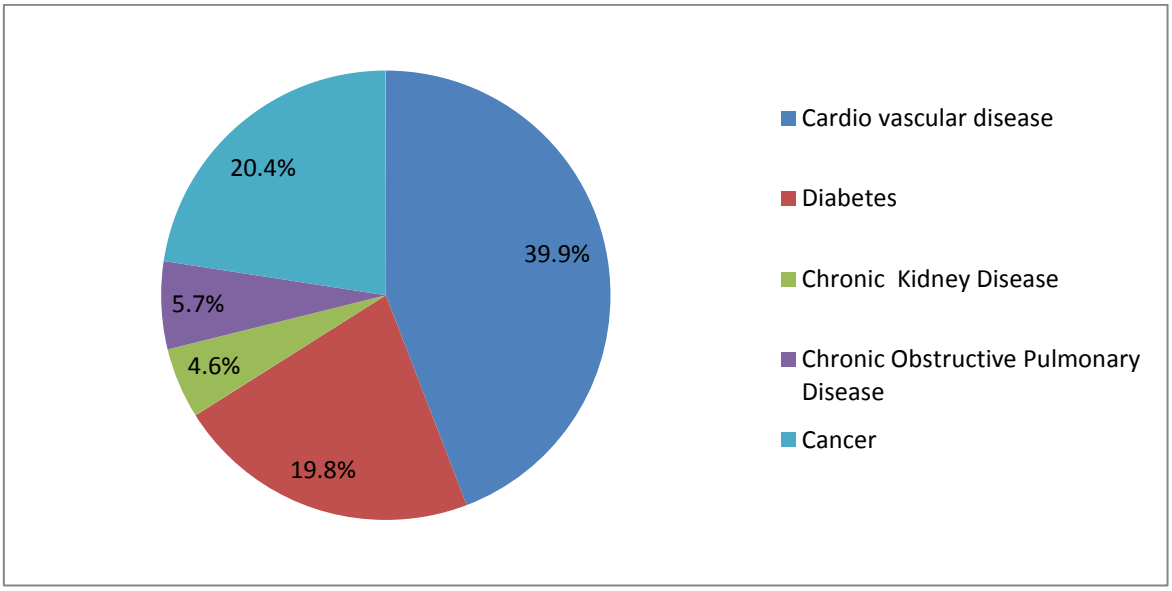

Figure 1: A pie chart describing the patterns of specific type of Chronic Non-Communicable diseasesin selected Government and Private Hospitals of Addis Ababa, 2007-2011

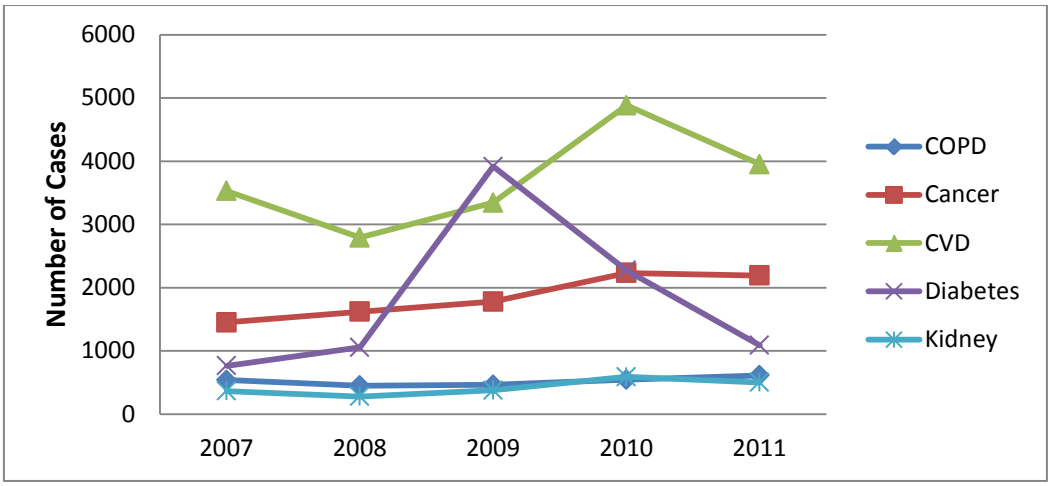

Figure 2: A line graph depicting the trend of major Chronic Non-Communicable Diseases over five years in selected Government and Private Hospitals of Addis Ababa, 2007-2011

Table 2: Percentage distribution of cases with cardiovascular diseases &hypertension in selected Government and Private Hospitals of Addis Ababa, 2007-2011

Types of diseases	Number of Cases	Percentages
Cardiovascular		
Rheumatic heart disease	3613	31.5
Coronary heart disease	2828	24.6
HTNHHD	1553	13.5
CHF	548	4.8
Ischemic heart disease	364	3.2
Cardiomayopathy	355	3.1
Congenital heart disease	315	2.7
Other cardio vascular disease	1900	16.6
Total	11476	100.0
Hypertension		
Hypertension	8843	or 43.5%

Table 3: The percentage distribution of cases with Diabetes and Chronic Obstructive Pulmonary Diseasesin selected Government and Private Hospitals of Addis Ababa, 2007-2011

Type of Diseases	Number of cases	Percent (%)
Diabetes		
Type-1	1518	16.5
Type-2	7687	83.5
Total	9205	100.0
Chronic Obstructive Pulmonary Disease		
Asthma	1598	60.6
COPD	1039	39.4
Total	2637	100.0

Table 4 shows among out-patients who were with chronic kidney diseases, although the etiology could not be extracted from the records, about 18% of the patients were having chronic renal failure and more than one third were having health problems related with chronic glomerulonephritis,nephrolithiasis and hypertensive nephropathy.

Table 4: The percentage distribution of cases with Chronic Kidney Diseasesin selected Government and Private Hospitals of Addis Ababa, 2007-2011.

Types of chronic Kidney disease	Number	Percentage
Chronic Renal failure	369	17.5
Chronic. Glomerulonephritis	356	16.8
Nephrolithiasis	241	11.4
Hypertensive nephropathy	221	10.5
Obstetricuropathy	151	7.2
Benin Prostatic Hyperplasia	124	5.9
Diabetic nephropathy	116	5.5
Renal cysts (polycystic)	68	3.2
Systemic Lupus Eretematous(LSE)	55	2.6
Others	410	19.4
Total	2111	100.0

Table 5 shows among the patients with cancer, about 26% were diagnosed as patients with cervical cancer, 19% breast cancer followed by about 9% with sarcoma.

Table 5: The percentage ofcases with Cancer in selected Government and Private Hospitals of Addis Ababa, 2007-2011

Type of Cancer cases	**Sex**		
	Male (%)	Female (%)	**Total (%)**
Cervix	-	26.0	26.0
Breast	1.8	16.9	18.7
Sarcoma	5.2	3.7	8.8
Lymphoma+Leukemia	5.4	2.8	8.2
Head and Neck	0.2	0.3	0.5
Colorectal	0.2	0.4	0.5
others	16.9	20.3	37.2
Total Cancer cases	31.0	69.0	100.0

Table 6 shows the status of patients while making follow-up as a client of out-patient clinic. The record for the study period disclosed that about 56% of all patients with NCDs were actively following their health status by making frequent visit to their respective out-patient referral clinics whereas 2% were deceased. About 41% of all NCDs patients were found to be drop-out for unknown reasons.

Table 6: The status of patients enrolled for treatment of Chronic Non-Communicable

	Number	Percentages
Alive	25,962	55.7
Dropped out	19,177	41.2
Deceased/Dead	1,027	2.2
Referred	403	0.9
Total	46,569	100.0

4. Discussion

The experience of the developed countries demonstrates that prevention and control of chronic diseases risk factors today will have significant health and economic returns in the reduction of future burden of diseases. However, awareness, case detection, and management on NCDs or their risk factors are low in developing countries [31]. In the absence of representative data in the country, compiling, analyzing, and interpreting available hospital data were found to be a cost effective proxy of prevalence rates of NCDs. Among the five chronic non-communicable disease considered in this study, cardiovascular disease takes a lion-share as a chronic non-communicable disease.

Although, there is no compressive nationally representative survey in Ethiopia, different studies indicated that hypertension is the most common CVD risk factor in both rural and urban areas. A study conducted in Addis Abeba & Butajera showed prevalence rate of 31% in Addis Ababa and prevalence of 10% in rural Butajira [9]. In this study neerly 44% of the records were found to be hypertensive cases. Moreover, recent studies have described a growing prevalence of hypertension and other CVD in Sub-Saharan African countries.

In the current retrospective study, diabetes mellitus was found to be 20% which is the second most common NCD in the study. Previous retrospective study on trend of diabetic admissions showed that there has been an increased trend of diabetic admissions both at St. Paul and Tikur Anbessa Specialized Hospital from 2005 to 2009. In addition, the previous study shows that both Type 1 and Type 2 diabetes are increasing and cardiovascular disease is the leading cause of death in hospitalized diabetic patients [8].

The incidence of cancer is raising in low and middle income countries. In Africa it is one of the major emerging health problems. According to International Agency for Research on Cancer (IARC), 715,000 new cancer cases and 542,000 cancer deaths occurred in Africa in the year 2008.

In Ethiopia, there is no data on incidence and mortality of cancer. According to Hospital based data, cancer is becoming now a major health problem in Ethiopia. In the present study, a Cancer case was found to be 20%. Although data regarding cancer were collected only from the Radiotherapy Center of the Tikur Anbessa Specialized Hospital, results have to be interpreted cautiously.

With regard to chronic obstructive pulmonary diseases (COPD) and Asthma, the record showed 6% of the cases were patients of bronchial asthma. In the recent past, little was known about bronchial asthma in Ethiopia, it was after mid-1970's that asthma begun to be considered as a major case in the hospitals. For example, 4.3% and 1.7% respectively of medical admissions to the Armed Forces hospital and in three civilian hospitals in Addis Ababa were due to asthma [32].

Like that of other NCDs, there is very limited data on renal diseases in Ethiopia and most data come from hospital based studies and estimates. The present study showed about 5% of the total record was found to be chronic kidney diseases. Renal diseases accounted for 1.2 to 6% of adult hospital medical admissions in reports from various parts of the country. According to the latest WHO data published in April 2011, Kidney Disease Deaths in Ethiopia reached 12,038 or 1.47% of total deaths [2].

It was observed that in the present study large drop-out rate of patients for unknown reasons was found to be very high. Although it needs further investigation, high drop-out rate of patients could probably be related to patient fatigue for life long medical care & social support; patients choice for alternative traditional medications like use of holly water and so on.

5. Conclusion and recommendations

The present assessment revealed that an increasing trend of NCDs over the study period and its emergence as a public health problems in Addis Ababa. Therefore, there is a need for nation-wide population-based representative survey to quantify the burden with risk factors for policy formulation and design interventions against this emerging epidemic. Furthermore, as the drop-out rate of patients was very high, further study is recommended to investigate the reasons for discontinuation of care & treatment offered at facility level.

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