

https://dspace.org/

Assessment of selected non-communicable diseases in an urban health district of South Africa

Makhudu, Modise Elias

2015-03-27
http://hdl.handle.net/10539/17338

Downloaded from a DSpace repository. https://dspace.org/

ASSESSMENT OF SELECTED NON-COMMUNICABLE DISEASES IN AN URBAN HEALTH DISTRICT OF SOUTH AFRICA

MODISE ELIAS MAKHUDU

A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Public Health in the field of Hospital Management

October, 2014

DECLARATION

I, Modise Elias Makhudu, declare that this research report is my own work. It is being submitted for the degree of Master Public Health in the field of Hospital Management at the University of the Witwatersrand, Johannesburg, South Africa. It has not been submitted before any degree or for any examination at this stage or any other University.

_____ _____

Modise Elias Makhudu **Date**

DEDICATION

All people working diligently to control the scourge of Non Communicable Diseases.

ACKNOWLEDGEMENT

I would to a great extent express my unassuming appreciation to the following

people who made it certain that the study is completed.

- Dr Debashis Basu as a supervisor, mentor and a coach;
- Dr. Jacqui Mendes for unconditional technical support and guidance;
- Ms Sue Le Roux for assistance in getting approval from Gauteng Department of Health to conduct the study in health facilities;
- Ms Dudu Dube for organizing data collection and administration thereof;
- Personnel especially nurses from the Johannesburg health facilities where the study was conducted;
- Mr. Benny Sikhakhane and Ms. Mokgadi Mafojane for support with health information of Johannesburg Health District;
- Ms Erika Du Plooy for working many long hours in capturing the data.

ABSTRACT

Background: The World Health Organization predicts that the deaths related to Non-Communicable Diseases in Africa will rise by 27% over the next decade. As a response to the problem, the National Department of Health in South Africa

introduced interventions that focussed on implementing health facility based Non-Communicable Diseases register and a monitoring tool. The Gauteng Department of Health in South Africa started introducing the monitoring tool in public health facilities since April 2011 in a phased manner. This study used a one week data collected in the month of April 2011 in selected health facilities within the Johannesburg Health District.

Aim: To describe the socio-demographic and clinical profiles of the study population attending the health facilities in Johannesburg Health District.

Methodology: A cross-sectional study design was used for the study. The data was collected from the selected Community Health Centres using the monitoring tool developed by the National Department of Health. The data were collected for a week from randomly selected health facilities in 2011.

Results: Nine-hundred and sixty eight study participants were recruited from the five community health centres for the assessment of non-communicable diseases. Among the study participants, the prevalence of hypertension (94.6%) was highest followed by diabetes (39.4%) and hyper-cholesterolaemia (4.6%). A number of study participants had comorbidity associated with all three conditions. The majority of them were 45 years and above (88%), female (53%), and black (98%); There were no significant association between these three conditions and risk factors such as smoking and alcohol drinking. The complications among the study participants include nephropathy, cardiac diseases and retinopathy. Annual screening was done for a number of study participants but it was erratically done so that all study participants were not screened. Twenty-two percent of 968 study participants have blood pressure of more than 140/90mmHg. Twenty percent of study participants have a weight more than 90kg. The sugar level of 22% study participants was more than 7mmol/l.

Conclusion: The NCD monitoring tool could be used as an effective tool for management of NCD in PHC setting like Johannesburg Health District.

TABLE OF CONTENTS

DECLARATION ii
DEDICATION iii
ACKNOWLEDGEMENT iii
ABSTRACT iv
TABLE OF CONTENTS vi
LIST OF FIGURES ix
LIST OF TABLES x

LIST OF ABBREVIATIONS xii
CHAPTER 1 ..... - 1 -
1.1 BACKGROUND ..... - 1 -
1.2 JUSTIFICATION FOR THE STUDY ..... - 2 -
1.3 RESEARCH QUESTION ..... - 2 -
1.4 STUDY OBJECTIVES ..... - 3 -
1.4.1 BROAD OBJECTIVE ..... - 3 -
1.4.2 SPECIFIC OBJECTIVES ..... - 3 -
1.5 FOLLOWING CHAPTERS ..... - 3 -
CHAPTER 2 ..... - 5 -
2.1 INTRODUCTION ..... - 5 -
2.1.1 INTERNATIONAL CONTEXT OF NON-COMMUNICABLE DISEASES ..... - 5 -
2.1.2 INTERNATIONAL RECOMMENDED INTERVENTIONS FOR NON-COMMUNICABLE DISEASES ..... - 6 -
2.2 SOUTH AFRICAN CONTEXT FOR NON-COMMUNICABLE DISEASES ..... - 8 -
2.3 NCD PREVALENCE IN THE JOHANNESBURG HEALTH DISTRICT ..... - 9 -
2.4 SUPPORTIVE POLICY FRAMEWORKS ..... - 10 -
2.5 FACTORS INFLUENCING MANAGEMENT OF NCD ..... - 12 -
2.5.1 PATIENT RELATED FACTORS ..... - 12 -
2.5.2 HEALTH CARE PROFESSIONAL FACTORS ..... - 13 -
2.5.3 HEALTH SYSTEM FACTORS ..... - 13 -
CHAPTER 3 ..... - 14 -
METHODOLOGY ..... - 14 -
3.1 STUDY DESIGN ..... - 14 -
3.2 STUDY SETTING ..... - 14 -
3.3 STUDY SCOPE ..... - 16 -
3.4 STUDY PERIOD ..... - 16 -
3.5 STUDY POPULATION AND SAMPLING ..... - 16 -
3.6 DATA MANAGEMENT ..... - 17 -
3.6.1 VARIABLES ..... - 17 -
3.6.2 DATA COLLECTION ..... - 17 -
3.6.3 DATA ANALYSIS ..... - 17 -

3.7 ETHICAL CONSIDERATIONS ..... - 18 -
CHAPTER 4 ..... - 19 -
RESULTS ..... - 19 -
4.1 STUDY PARTICIPANTS ..... - 19 -
4.2 SOCIO-DEMOGRAPHIC PROFILE ..... - 21 -
4.2.1 AGE DISTRIBUTION ..... - 21 -
4.2.2 GENDER DISTRIBUTION ..... - 22 -
4.2.3 ETHNICITY ..... - 23 -
4.3 CLINICAL PROFILE ..... - 24 -
4.3.1 RISK FACTORS ..... - 24 -
4.3.2 COMPLICATIONS ..... - 25 -
4.3.3 SCREENING ..... - 25 -
4.3.4 ANNUAL EXAMINATIONS ..... - 26 -
4.3.5 CLINICAL EXAMINATIONS ..... - 26 -
4.3.6 HEALTH EDUCATION ..... - 27 -
CHAPTER 5 ..... - 28 -
DISCUSSIONS ..... - 28 -
5.1 INTRODUCTION ..... - 28 -
5.2 DISTRIBUTION OF NCD OF THE STUDY PARTICIPANTS ..... - 28 -
5.3 RISK FACTORS OF STUDY PARTICIPANTS WITH SELECTED NCD ..... - 29 -
5.3.1 AGE DISTRIBUTION ..... - 29 -
5.3.2 GENDER ..... - 30 -
5.3.3 ETHNICITY ..... - 30 -
5.3.4 SMOKING AND ALCOHOL ..... - 30 -
5.3.5 CO-MORBIDITY ..... - 31 -
5.4 MANAGEMENT OF NCD ..... - 31 -
5.4.1 CLINICAL EXAMINATIONS ..... - 31 -
5.4.2 SCREENING ..... - 32 -
5.4.3 ANNUAL EXAMINATIONS ..... - 32 -
5.4.4 HEALTH EDUCATION ..... - 32 -
CHAPTER 6 ..... - 34 -
6.1 CONCLUSIONS RELATED TO THE AIMS OF THE STUDY ..... - 34 -

6.1.1 DESCRIPTION OF THE CLINICAL PROFILES OF PATIENTS ..... - 34 -
6.1.2 DESCRIPTION OF THE SOCIO-DEMOGRAPHIC AND CLINICAL PROFILES OF STUDY PARTICIPANTS ATTENDING THESE CHCs ..... - 34 -
6.2 LIMITATIONS OF THE STUDY ..... - 35 -
6.3 RECOMMENDATIONS ..... - 35 -
6.3.1 FOLLOW-UP ..... - 35 -
6.3.2 FUTURE RESEARCH ..... - 36 -
6.4 CONCLUSION ..... - 36 -
REFERENCES ..... - 37 -
APPENDICES ..... - 41 -
APPENDIX A: ETHICS CLEARANCE CERTIFICATE AND LETTERS OF APPROVAL ..... - 42 -
APPENDIX B: DATA COLLECTION TOOL ..... - 46 -

LIST OF FIGURES

Figure 2.1: Causes of Chronic Diseases ..... - 7 -
Figure 2.2: World Health Organization STEPwise – Non communicable Diseases Risk factors concept ..... - 8 -
Figure 3.1 Gauteng Province ..... - 15 -
Figure 4.1 Study participants (n = 968) ..... - 19 -
Figure 4.2 Age distribution of study participants ..... - 22 -

LIST OF TABLES

Table 2.1 Prevalence of Diabetes Mellitus in 7 Sub-districts in Johannesburg ..... - 9 -
Table 2.2 Prevalence of hypertension in 7 Sub-districts in Johannesburg ..... - 10 -
Table 2.3 South African National Guidelines on NCD ..... - 11 -
Table 3.1 List of variables ..... - 17 -
Table 4.1 Number of study participants per disease ..... - 20 -
Table 4.2 co-morbidity of diseases ..... - 20 -
Table 4.3 Age distribution of three disease cohorts ..... - 21 -
Table 4.4 Age distribution ..... - 22 -
Table 4.5 Gender ..... - 23 -
Table 4.6 Ethnicity ..... - 23 -
Table 4.7 Smoking ..... - 24 -
Table 4.8 Alcohol ..... - 24 -
Table 4.9 Complications ..... - 25 -
Table 4.10 Screening ..... - 25 -
Table 4.11 Annual examinations ..... - 26 -
Table 4.12 Clinical examinations ..... - 27 -
Table 4.13 Health education ..... - 27 -

GLOSSARY OF TERMS

Assessment refers to the measure of the extent of something and the degree to which action or policy is carried out.

Hypertension patients for follow-up: Patients are diagnosed, put on treatment and regularly visit the health facility to check compliance and control of the hypertension (source: DHIS, 2010)

Hypertension patients on treatment: Number of clients initiated on hypertension treatment for the first time (source: DHIS, 2010)

Hypertension patients on register: All patients who have controlled or no controlled hypertension put on register or some of records. (source: DHIS, 2010)

Diabetes patients for follow-up: Patients are diagnosed, put on treatment and regularly visit the health facility to check compliance and control of the diabetes (source: DHIS, 2010)

Diabetes patients on treatment: Number of clients initiated on diabetes treatment for the first time (source: DHIS, 2010)

Diabetes patients on register: All patients who have controlled or no controlled diabetes put on register or some of records. (source: DHIS, 2010)

Health district is defined as geographic area that is small enough to allow maximal involvement of the community so that local health needs are met, but also large enough to effect economies of scale (Department of Health, White paper on transformation of Health System in South Africa, 1997).

Selected NCD is hypertension, diabetes, and hypercholesterolemia

Co-morbidity refers to simultaneous occurrence of two or more diseases. Example of

chronic diseases co-morbidity include: (1) the association between chronic obstructive pulmonary disease and cancer. (Source: Chronic diseases and their risks factors: a global burden)

Urban is an area that is characterized by higher population density and vast human features in comparison to areas surrounding it.

LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
BMI	Body Mass Index
CHCs	Community Health Centres
DHIS	District Health Information System
HIV	Human Immunodeficiency Virus
JHB	Johannesburg
ID	Identity document
MDG	Millennium Developmental Goals
NCD	Non-Communicable Diseases
NDoH	National Department of Health
NSDA	Negotiated Service Delivery Agreement
PHC	Primary Health Care
NCSS	A statistical analysis and graphics software package that outputs graphics from spreadsheet, database, and statistical files for use with popular word processors and presentation software.
SEMDSA	The Society for Endocrinology, Metabolism and Diabetes of South Africa
SD	Standard deviation
UN	United Nations
WHO	World Health Organisation
WITS	University of the Witwatersrand

CHAPTER 1

INTRODUCTION

The purpose of this study was to assess the selected Non-Communicable Diseases in an urban health district of South Africa. This introductory chapter will cover the background to the study, statement of the problem, its aims and objectives and an outline of subsequent chapters.

1.1 BACKGROUND

During the last decade, non-communicable diseases (NCD) had been getting much attention due to increasing prevalence, morbidity and mortality associated with them not only in developed but also in developing countries. It is estimated that 58% of all deaths worldwide were contributed to NCD in 2008 (Alwan, MacLean, Riley, 2010). These diseases are generally regarded as disease of the affluent. The WHO predicts that the deaths related to NCD in Africa will rise by 27% over the next decade (Alwan, 2008).

Despite the mortality, morbidity and the burden of the NCD, the conditions had eluded the health list of priorities. The NCD did not feature in the MDG of the United Nations. However, the situation had changed during last few years. In 2010, the United Nations General Assembly passed a resolution on its 86th plenary session for prevention and control of non-communicable diseases. The Assembly also unanimously adopted a resolution by which it decided to convene a high-level meeting on "*Prevention and control of non-communicable diseases"* in September 2011 due to high prevalence of NCD in both developed and developing countries (UNO, 2010).

The South African Minister of Health also highlighted the challenges associated with high burden of NCD in South Africa at the First Global Conference on Healthy Lifestyles and NCD Control held in Moscow in 2011 (Department of Health, 2011). Recently, the

NCD cluster within the National Department of Health had introduced a number of measures for prevention and control of NCD as well as collected accurate information about the burden of NCD in South Africa. This included a NCD register for keeping records of NCD patients at the clinic as well as a NCD monitoring tool called NCD passport (Appendix B) to record individual patient details.

1.2 JUSTIFICATION FOR THE STUDY

The Gauteng Province has one of the highest burdens of NCD in the country (Gauteng Department of Health, 2008). Therefore, the Gauteng Department of Health has decided to monitor closely the prevalence and the clinical management of NCD through its five districts (namely Ekurhuleni, Johannesburg, Sedibeng, Tshwane and West Rand). As a part of that process, the district offices are expected to monitor routinely the DHIS data on NCD, which were not often done optimally. In addition, the districts were asked to introduce the NCD register and NCD passport (a monitoring tool) as disease management tools in the public health facilities. The study sought to describe the socio-demographic and clinical profiles of the patients attending the health facilities in Johannesburg Health District. The three selected NCD (Hypertension, Diabetes and Hypercholesterolemia) were chosen based on their common etio-pathology. They are also the commonest conditions seen in the public health facilities in South Africa.

The findings from this study would hopefully assist the District Management Team to understand the burden of the NCD and the associated clinical management of these diseases in the District.

1.3 RESEARCH QUESTION

What are the socio-demographic and clinical profiles of study participants with selected NCD attending the health facilities in the Johannesburg Health District?

1.4 STUDY OBJECTIVES

1.4.1 BROAD OBJECTIVE

To describe the socio-demographic and clinical profiles of study participants with selected NCD attending public health facilities in the Johannesburg Health District during the one week period in 2011.

1.4.2 SPECIFIC OBJECTIVES

1. To describe the socio-demographic profile (age, gender and ethnicity) of study participants with selected NCD (Diabetes, Hypertension and hypercholesterolemia) during one week study period.
2. To describe the clinical profile (such as type of diseases) of the same study participants.

1.5 FOLLOWING CHAPTERS

The background to the research has been outlined and discussed. Subsequently, research question and objectives were defined in this first chapter. A brief outline of the following chapters is described below.

Chapter Two: Literature Review: The purpose of the literature review is to review related literature and to discuss concepts related to socio-demographic and clinical profiles of study participants with NCD.

Chapter Three: Research Methodology: The chapter describes the research methodology, study design, setting and scope and data management techniques used in this study.

Chapter Four: Presentation of Results: This chapter deals with an analysis of the data collected for this study relating to its aim and objectives.

Chapter Five: Discussion: The findings from the review of the literature are included in this chapter with the results obtained from the analysis in order to address the aims and objectives of the study.

Chapter Six: Conclusions and Recommendations: The chapter is the last part of the report and derives conclusions from the research related to the objectives of this study, makes recommendations and highlights the areas for future research in the field of NCD.

CHAPTER 2

LITERATURE REVIEW

This chapter discusses the appropriate and relevant literature on the socio-demographic and clinical profiles of study participants with NCD. In addition to published literature, information from various unpublished sources is also reviewed.

2.1 INTRODUCTION

2.1.1 INTERNATIONAL CONTEXT OF NON-COMMUNICABLE DISEASES

In 2008, 58% of all deaths worldwide (approximately 33 million) were related to non-communicable diseases (Alwan, et al, 2010). The Non-Communicable Disease (NCD) more specifically includes cardiovascular disease, diabetes, cancer, and chronic respiratory diseases (Abegunde, Mathers, Adam, et al, 2007).

Non-communicable diseases are generally regarded as a disease of the affluent. This misconception, is refuted as 80% of total NCD-related deaths occur in low and middle income countries (Alwan, et al, 2010). The deaths related to NCD in Africa could rise by 27% over the next decade (NCD alliance, 2011).The chronicity of NCD results in extensive mortality and morbidity. In developing countries, NCD develop at younger ages, and result in premature death (Alwan, et al, 2010). The economic burden that these diseases impose, on the individual and the health system, cannot be ignored (WHO, 2010a).

Despite the mortality and morbidity, and the significant worldwide burden, NCD have eluded the public health list of priorities. In 2000, NCD did not feature amongst the eight Millennium Development Goals identified by the United Nations. This may have dictated the limited funding focussed on it. The Centre for Global Development reported that

less than three percent of the US$22 billion spent on health, by international aid agencies in lower middle income countries, is spent on NCD (NCD alliance, 2011).

Fortunately, World Leaders in May 2010 resolved to hold a United Nations Summit on NCD, which was held in September 2011 in New York. The NCD Alliance Partners have taken the lead in ensuring that world leaders commit to specifically identified priorities on relevant agenda developed by a participatory effort of stakeholders' worldwide (NCD alliance, 2011).

2.1.2 INTERNATIONAL RECOMMENDED INTERVENTIONS FOR NON-COMMUNICABLE DISEASES

In many developing countries the health system is functioning at maximum capacity. A worsening epidemic of NCD is set to further impose on an already overwhelmed system (Abegunde, et al, 2007). The NCD Alliance, among its many suggestions has highlighted the importance of health system strengthening (HSS) with a particular focus on primary health care (PHC) addressing the integration of NCD management at this level. The basis of successful NCD control relies strongly on effective service approach, health promotion and prevention (Puoane, Tsokeli, Sanders, et al, 2008).

NCD have complex aetiologies; social-economic, environmental, cultural, biological determinants of health all play a role in the disease development (Figure 2.1). For this reason multi-pronged approaches to prevent and alter the modifiable risk factors are recommended for interventions (WHO, 2010b)

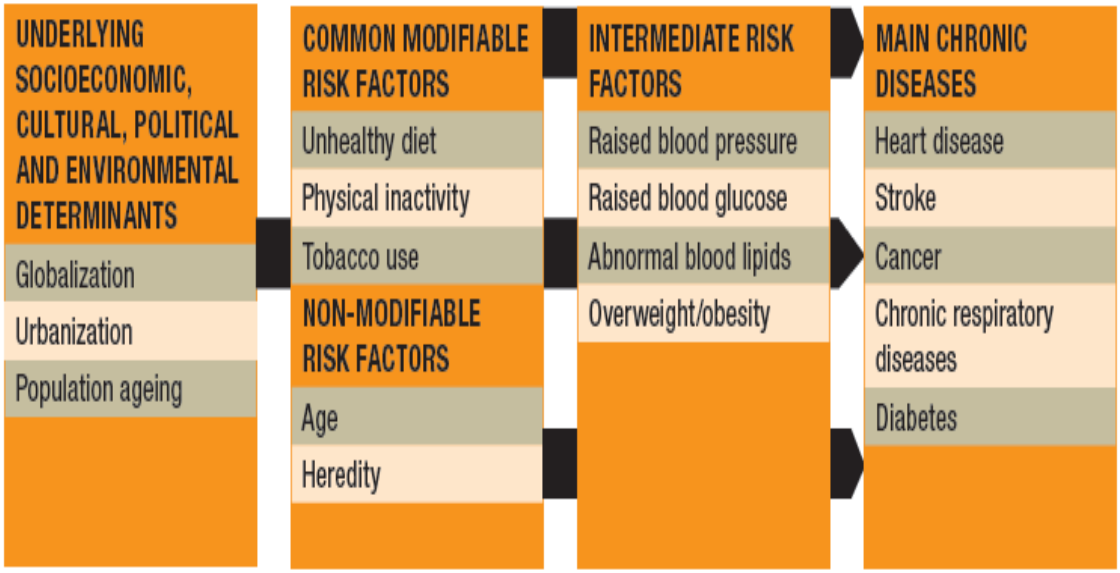


Figure 2.1: Causes of Chronic Diseases

Source: NCD Alliance, 2011

Disease Control Priorities Project in 2006 listed a set of priority interventions identified as cost-effective and affordable to implement in various settings. These included supporting and education of populations to increase physical activity, improve diets, relevant social marketing and facilitating healthy lifestyle decisions. The development of sustainable surveillance systems that monitor weight and height, physical activity, and key dietary variables is a key intervention and a focus of this study (Jamison, Breman, Measham, et al. 2006).

The WHO STEPwise Framework for NCD Risk Factor Surveillance (Figure 2.2) was expected to assist DoH in resource poor settings to identify current and future public health needs within the sphere of chronic care. The pinnacle of this framework should enhance the essential surveillance of physical and bio-chemical measurements in the management of risk factors (Bonita, De Court, Dwyer, 2001).

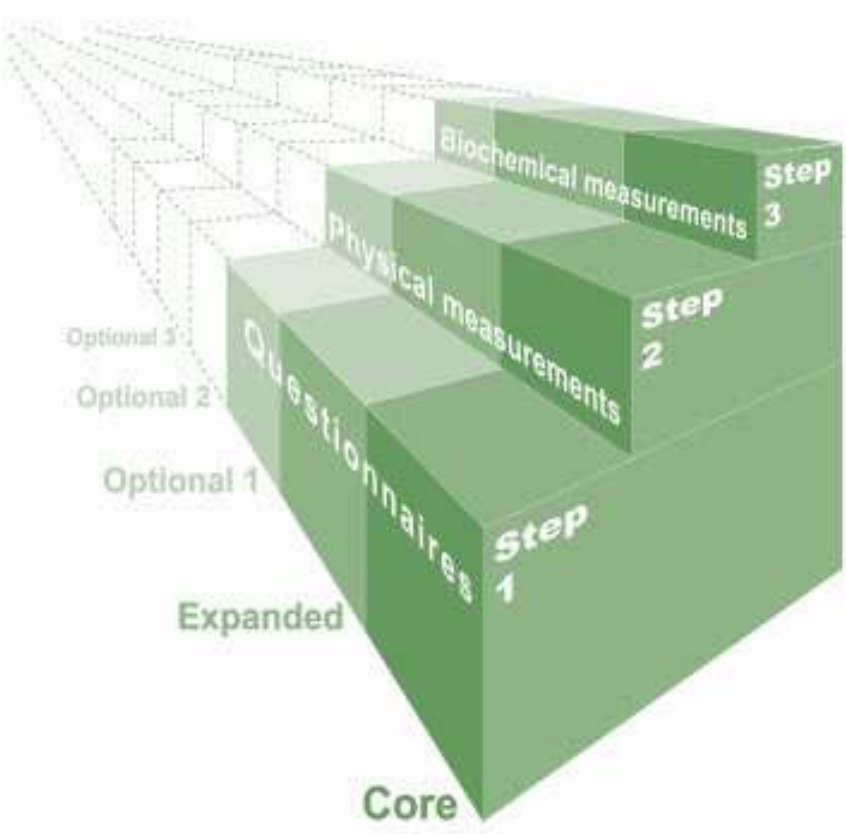


Figure 2.2: World Health Organization STEPwise – Non communicable Diseases Risk factors concept

Source: (Bonita, et al, 2001)

2.2 SOUTH AFRICAN CONTEXT FOR NON-COMMUNICABLE DISEASES

South Africa is contextualised within an epidemiological transition, and endures a quadruple burden of disease, with a high prevalence of communicable diseases, maternal and child health disorders, injury-related mortality and morbidity and NCD. With this in mind, it is not surprising that the importance of NCD prevention and management has gone unnoticed (Mayosi, Flisher, Lallo, et al, 2009). This created a significant negative on health outcomes in South Africa which was evidenced by data from 2004, where one-quarter of all disability-adjusted life years were attributed to NCD, more specifically 12% due to cardiovascular diseases, diabetes mellitus, respiratory diseases and cancers and in the same year one-fifth of total mortality was related to

NCD (National Department of Health, 2010).

The prevalence of NCD is set to increase, as South Africans continue to adopt sedentary lifestyles and unhealthy diets; and the life expectancy of HIV and AIDS patients increases with the advent of an enhanced Anti-Retroviral Therapy Programme. For this reason, Mayosi et al (2003) in the South African Lancet series have echoed the sentiments of the NCD Alliance, by calling for attention into health system strengthening to meet the increased demand for good quality chronic care.

2.3 NCD PREVALENCE IN THE JOHANNESBURG HEALTH DISTRICT

The data on diabetes and hypertension is routinely collected from all health facilities in the Johannesburg District. Three indicators are routinely collected for diabetes and hypertension. The District Health Report for 2011/12 showed that more diabetes follow up cases were found in the Sub-district D with the least cases in the Sub-district A. The proportion of follow up cases to treatment of cases was better in the Sub-district A than the Sub-district D (Johannesburg Heath District, 2012).

Table 2.1 Prevalence of Diabetes Mellitus in 7 Sub-districts in Johannesburg

	Totals	Sub-district A	Sub-district B	Sub-district C	Sub-district D	Sub-district E	Sub-district F	Sub-district G
Diabetes follow-up	183,278	3,871	8,970	7,888	85,242	27,897	21,302	28,108
Diabetes on treatment	13,783	1,684	834	433	3,872	1,217	1,499	4,244
Diabetes patients on register	86,373	2,011	5,471	12,329	32,858	177	7,219	26,308

The hypertension follow up cases were found to be more in the Sub-district D (Table

2.2). The proportion of follow up cases to treatment was low in most of the sub-districts (Johannesburg Heath District, 2012).

Table 2.2 Prevalence of hypertension in 7 Sub-districts in Johannesburg

	Totals	Sub-district A	Sub-district B	Sub-district C	Sub-district D	Sub-district E	Sub-district F	Sub-district G
Hypertension on treatment	23,814	1,744	1,959	1,239	4,757	2,073	3,547	8,495
Hypertension follow-up	672,899	27,107	38,448	39,303	314,232	87,359	66,494	99,956
Hypertensive patients on register	334,298	8,632	38,382	60,227	104,661	906	34,781	86,709

2.4 SUPPORTIVE POLICY FRAMEWORKS

With anticipation from the UN Summit on NCD, the political context began to change and to target strategies that would have NCD prevention and control as an outcome. This is essential as the NCD Alliance advocates that governments become accountable and measured on their successes in preventing and managing NCD (NCD Alliance, 2011). The National Department of Health (NDoH) Medium Term Strategic Plan 2010/11-2012/13 among its ten priorities has identified "Mass Mobilisation For Better Health" a commitment of the health sector to enhance prevention and management strategies to mitigate the burden of NCD (National Department of Health, 2010a). Various policies and guidelines were introduced in South Africa since 2006 to manage the emergence of the NCD within the health system. These policies require that all health facilities in South Africa are expected to capture data on the prescribed registers or forms of NCD patients and to clinically manage all NCD as per guidelines and procedures outlined from the policies. The researcher perceives that the burden of NCD is unknown to many health care workers and managers and often the policies with guidelines are not being implemented.

Subsequently, the Negotiated Service Delivery Agreement (NSDA) within the four output areas (namely increasing life expectancy, decreasing maternal and child mortality, combating HIV and AIDS and decreasing the burden of disease from tuberculosis and strengthening health system effectiveness), has spoken to the focus on NCD prevention and management, and increased influx of resources. Improved surveillance of chronic diseases are required and the identification of innovative technologies in the sector, including recruiting and strengthening the capacity of community health workers' involvement in the implementation of the chronic care model (National Department of Health, 2010).

Furthermore, National Guidelines published by the NDoH in 2006 , entitled "Non-Communicable Diseases Strategic Vision" explains the effective management of NCD and the integration all chronic diseases in its treatment in a patient-centred approach alignment of a formation of health public policy (National Department of Health, 2006). Gauteng Department of Health's strategy has aligned itself with national priority and identified prevention and control NCD (Gauteng Department of Health and Social Development, 2009). This strategy included other guidelines as per Table 2.3.

Table 2.3 South African National Guidelines on NCD

Guidelines	**Year**
National Guidelines on Primary Prevention of Chronic Diseases of Lifestyle	2005
National Guideline: Non-communicable Diseases: A strategic Vision	2006
South African Hypertension Guideline	2011
South African Dyslipidaemia Guideline	2012
SEMDSA Guideline for Management of Type 2 Diabetes	2012

With strong leadership and the much needed political focus on NCD as suggested by the NCD Alliance (NCD Alliance, 2011), the time is appropriate to enhance the chronic care at the District. The Johannesburg Health District was reported to be experiencing challenges in service delivery (one of the six building blocks of the Health System) of in the areas of chronic diseases specifically diabetes and hypertension (Smith, 2007).

Hence the development of the Integrated Chronic Disease Map could act as a visual aid and comprehensive tool to simplify NCD prevention and management. The tool allows for risk factor surveillance of both modifiable risk factors (primary prevention), the assurance of appropriate control of biochemical markers (secondary prevention), and lastly investigations and monitoring of target organ damage (tertiary prevention) in a district setting.

2.5 FACTORS INFLUENCING MANAGEMENT OF NCD

Factors influencing management of NCD can be grouped into three main categories namely patient related factors, health professional related factors and health system related factors.

2.5.1 PATIENT RELATED FACTORS

Patient related factors such as knowledge, culture and beliefs influences people's attitude to health, as well as their health seeking behaviour and control of NCD (Baradaran and Knill-Jones, 2004). Patient factors that influence good management of NCD (such as diabetes) include compliance, regular attendance, health education, younger age and female (Alberti, Boudriga, Nabli, 2007). Although health education plays an important role in improving patients' compliance, patients are often not provided with appropriate health education at the health facilities (Moodley and Rambiritch, 2007).

2.5.2 HEALTH CARE PROFESSIONAL FACTORS

Better management of NCD is based on the continuous professional development and an up to date knowledge of health professionals about the management of NCD (Moodley and Rambiritch, 2007). Standardisation of care with the use of clinical guidelines has been shown to improve patient outcomes (Brown, Harris, Webster-Bogaert, et al, 2002).

Thorough clinical examination by health professionals is an essential component for management and prevention of complications (Steyn, Levitt, Patel, et al, 2008). However this requires time and health professionals often compromise that due to increased work load as a result of staff shortages. Other health care professional related factors identified included numbers of health care staff, their training, health care professional motivation (Sutton, McLean, 2006; Simmons, Lillian, Swan, et al, 2007).

2.5.3 HEALTH SYSTEM FACTORS

The clinical management of NCD requires good organisational systems which provide an efficient and effective management of resources such as drug, equipment (Brown, et al, 2002). The availability of innovative tools such as defaulter tracing and reminder systems could assist in achieving better control. Other health system related factors found to influence NCD care include the presence of dedicated NCD clinics, availability of clinical guidelines, and health (Alberti, et al, 2007).

CHAPTER 3

METHODOLOGY

The methodology for this study was selected on the basis of its aims and objectives. In this chapter the following were/would be discussed: setting, scope, and study design and research tools.

3.1 STUDY DESIGN

This was a cross sectional study conducted in Johannesburg Health District facilities.

3.2 STUDY SETTING

The study setting was Johannesburg Health District, an urban district, located in Gauteng Province of South Africa.

Gauteng Province has five health districts namely Johannesburg, Ekurhuleni, Tshwane, Sedibeng and West Rand. The sixth District Metsweding was recently merged with the Tshwane District. The Gauteng Department of Health provides health services to 8.3 million people (uninsured) through a network of hospitals; community health centres (CHCs), fixed primary health care (PHC) clinics and mobile clinics, as well as community outreach programmes.



Figure 3.1 Gauteng Province

Source: Annual Performance plan, 2010/2011-2012/13, Gauteng Department of Health

Johannesburg Health District

The Johannesburg Health District is one of the most populated districts in South Africa. Comparing the district with other four districts in the Gauteng Province, it has 114 (36%) clinics, 10 (29%) community health centres, one district hospital (9%), one specialised hospital, one psychiatric hospital, one (17%) regional hospital, one tertiary hospital (33%) and two (50%) central hospitals. All the health facilities provide services for patients suffering from NCD. According to Statistics South Africa's community survey, the population served by the public health facilities is estimated at 3,888,180 in 2007 (Statistics South Africa, 2007).

3.3 STUDY SCOPE

The study involved analysis of secondary data collected from selected CHCs using the NCD monitoring tool (Appendix B) introduced by the NDoH in 2011.

3.4 STUDY PERIOD

The study period was one week chosen randomly from 52 weeks (without any public holiday) in the year 2011.

3.5 STUDY POPULATION AND SAMPLING

The study population included NCD patients attending CHCs in JHB Health District. Five CHCs were randomly chosen from a total of seven sub-districts. There was no CHC in two sub-districts. One week (April 11-15) was chosen randomly from 52 weeks (without any public holiday) in the year 2011.

3.6 DATA MANAGEMENT

3.6.1 VARIABLES

The variables measured for the study are listed in Table 3.1.

Table 3.1 List of variables

Objectives	Variables
Socio-demographic profile	• Age • Gender (Male, female) • Ethnicity (Blacks, Whites, Coloureds, Asians)
Clinical profile	• Alcohol history • Smoking History • Blood pressure • Clinical examination • Blood glucose • Weight

3.6.2 DATA COLLECTION

The data was collected using the NCD tools designed by NDoH (Appendix B).

3.6.3 DATA ANALYSIS

Data was captured with MS Excel software and analysed with NCSS software (NCSS, 2007). Following descriptive statistics were reported upon.

- Continuous variables (such as age): Continuous variables with normal distributions: mean and standard deviation (SD). Other continuous variables: median and inter-quartile range.
- Categorical variables (such as ethnicity): proportion and range.

The following analytical statistical tests were used:

- Continuous variables: t-test and ANOVA
- Categorical variables: Chi-square test
- The association among the variables were measured with tests for correlation (Pearson or Spearman).

The statistical significance was calculated at the 95% confidence level.

3.7 ETHICAL CONSIDERATIONS

Permission for conducting research and accessing documents was provided by Head of Department for the Gauteng Department of Health and Social Development delegated representative (Appendix A). The study was also approved by University of the Witwatersrand Human Research Ethics Committee (Medical) (Appendix A). Confidentiality and anonymity was maintained all the time for collection, capturing, and reporting of the information. Patients' names and identifications were excluded while capturing data and separate study ID was generated for each patient.

CHAPTER 4

RESULTS

The results obtained from the analysis of data are described in this chapter.

4.1 STUDY PARTICIPANTS

Figure 4.1 shows that Zola CHC saw more selected NCD cases which is 35.9% of 968 of study participants among the five CHCs.

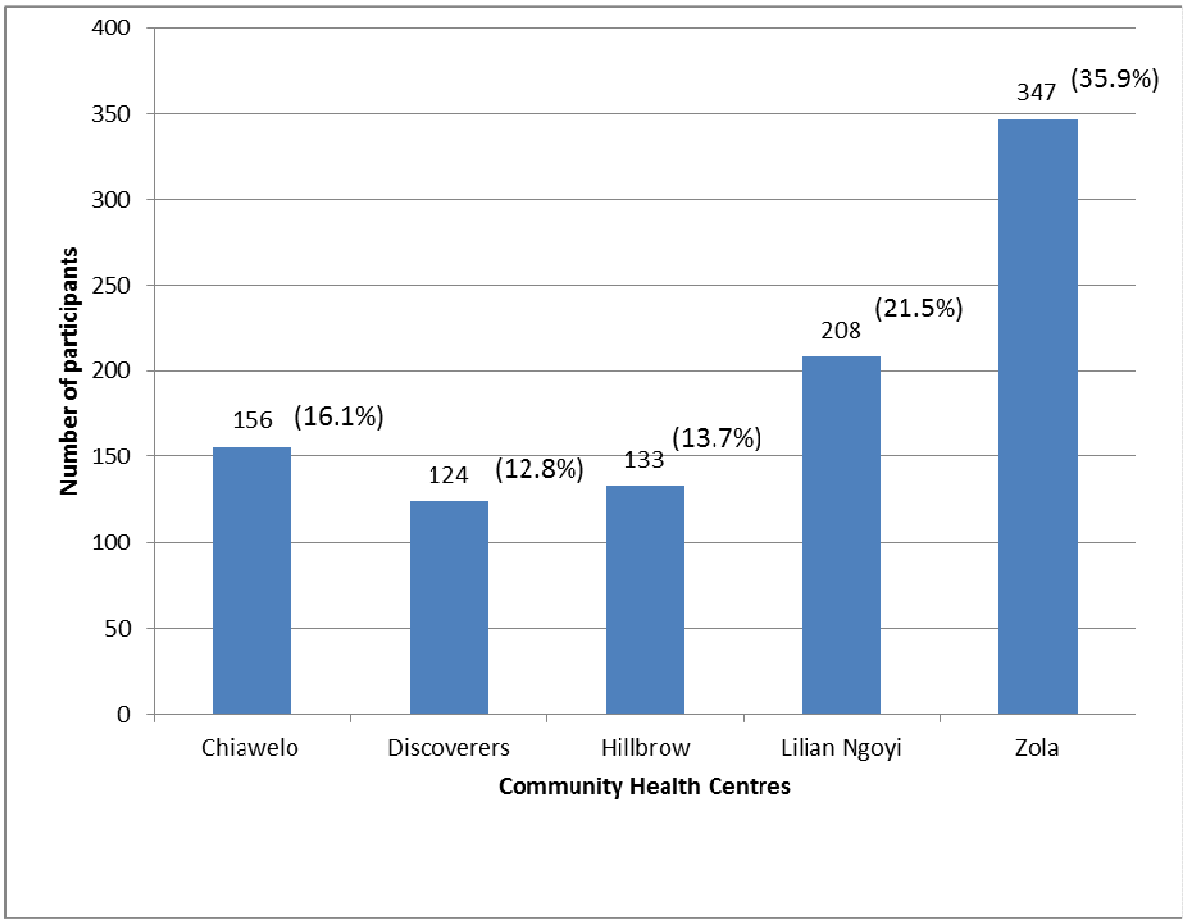


Figure 4.1 Study participants (n = 968)

The number of study participants was profiled according to the selected types of NCD as listed in Table 4.1. The proportion of study participants with diabetes mellitus was 39.4%; those with hypertension at 94.6% and the ones with hyper-cholesterolaemia were 4.6% of the total 969 participants.

Table 4.1 Number of study participants per disease

Sites	N	Diabetes	Hypertension	Hyper-cholesterolaemia
Chiawelo	156	77 (20.1%)	145 (15.8%)	24 (53.3%)
Discoverers	124	40 (10.4%)	120 (13.1%)	11 (24.4%)
Hillbrow	133	15 (3.9%)	132 (14.4%)	5 (11.1%)
LilianNgoyi	208	88 (23.0%)	198 (21.6%)	1 (2.0%)
Zola	347	162 (42.4%)	321 (35.0%)	4 (8.8%)
Total	**968**	**382**	**916**	**45**

However, a number of study participants had co-morbidities, which is listed in Table 4.2. Thirty-one study participants had all three diseases.

Table 4.2 co-morbidity of diseases

sites	N	Diabetes	Hypertension	Hyper-cholesterolaemia
Diabetes	382		271 (35.2%)	31 (68.8%)
Hypertension	916	271 (83.3%)		38 (84.4%)
Hyper-cholesterolaemia	45	31 (9.5%))	38 (4.9%)	
Total	968	325	768	45

4.2 SOCIO-DEMOGRAPHIC PROFILE

The socio-demographic profile of the study participants is described below. As a number of study participants had two or more diseases, the total number would not add up to 968. The profiles of the study participants were described for the entire cohort followed by categorisation according to three disease cohorts (diabetes, hypertension and hypercholesterolemia). For example, diabetic group would include diabetic study participants with or without hypertension and hypercholesterolemia or both.

4.2.1 AGE DISTRIBUTION

The mean age of the study participants was 59 years (standard deviation 12 years) with the age of youngest and oldest study participants were 19 and 96 years respectively (Table 4.3 and Figure 4.2).

Table 4.3 Age distribution of three disease cohorts

Age (years)	**n**	**Mean ± SD** (in years)
Diabetes	382	60 ± 11
Hypertension	916	59 ± 12
Hyper-cholesterolaemia	45	60± 10
Total	**968**	**59 ± 12**

SD: standard deviation

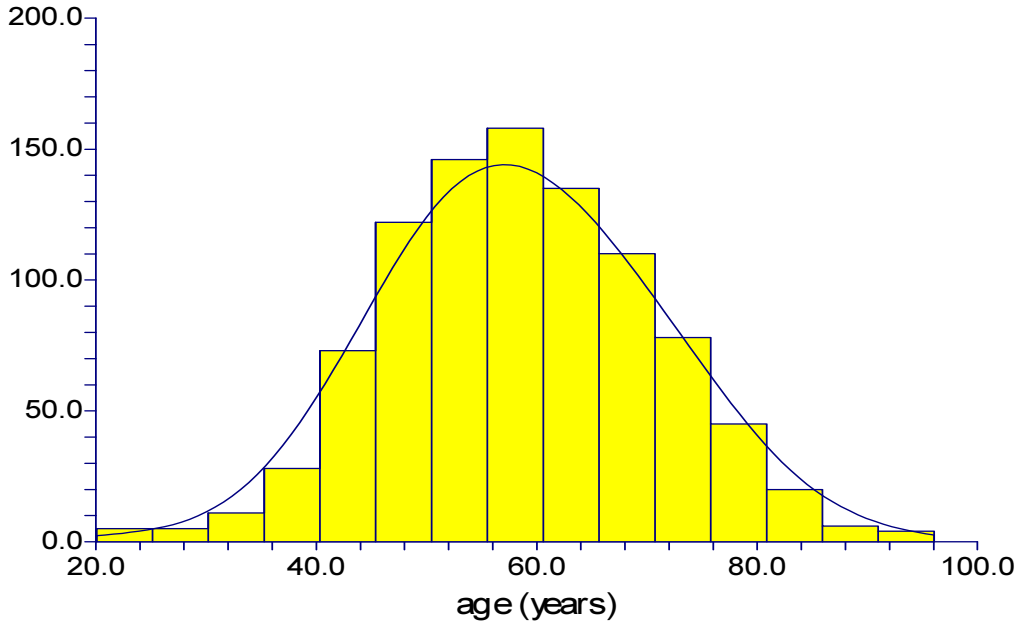


Figure 4.2 Age distribution of study participants

Age is categorised into four categories: less than 44 years, 44-54 years, 55-63 years and more than 64 years (Table 4.4). The majority of the study participants were 45 years and above.

Table 4.4 Age distribution

Age categories	**N (%)**
Less than 45 years	120 (12.4%)
45-54 years	268 (27.7%)
55 – 64 years	298 (30.8%)
More than 65 years	282 (29.2%)
Total	**968 (100%)**

4.2.2 GENDER DISTRIBUTION

The distribution of gender of the study participants is listed in Table 4.5. The prevalence of both hypertension and diabetes mellitus was more common in females than males.

Table 4.5 Gender

	Total	Female	Male
Diabetes	382	254 (67%)	128 (33%)
Hypertension	914	633(69%)	281 (31%)
Hyper-cholesterolemia	45	24(53%)	21 (47%)

There was a significant difference between male and female (chi- square test) in terms of prevalence of diabetes ($p<0.001$) and hyper-cholesterolemia ($p=0.03$).

4.2.3 ETHNICITY

There were more study participants from Black community than from other race groups in the study cohort (Table 4.6). There were no white or Asian population in the hyper-cholesterolaemia Group. Fisher's Exact test showed no significant differences between the two ethnic groups in terms of prevalence of diabetes and hypertension ($p = 0.15$).

Table 4.6 Ethnicity

Ethnicity	N	Diabetes	Hypertension	Hyper-cholesterolaemia
Blacks	890	378	839	41
Whites	3	0	3	0
Asians	2	1	2	0
Coloureds	3	1	3	1
Total	898*	378	897	42

*missing values

4.3 CLINICAL PROFILE

4.3.1 RISK FACTORS

4.3.1.1 SMOKING

Interestingly, there were more cases of hypertension, diabetes mellitus and cholesterol among non-smokers (Table 4.7). However, chi-square test showed no significant differences between the two groups in terms of prevalence of diabetes, hypertension and hyper-cholesterolaemia (p = 0.90).

Table 4.7 Smoking

	Total	Smoker	Non-smoker
Diabetes	382(100%)	28 (7%)	354 (93%)
Hypertension	916(100%)	61 (7%)	855 (93%)
Hyper-cholesterolaemia	45 (100%)	4 (9%)	41 (91%)

4.3.1.2 ALCOHOL

Non-alcohol drinkers were more in numbers across the three selected NCD than alcohol drinkers (Table 4.8). However, chi-square test showed no significant differences between the two groups in terms of prevalence of diabetes, hypertension and hyper-cholesterolaemia (p = 0.50).

Table 4.8 Alcohol

	Total	Alcohol Drinker	Non-alcohol drinker
Diabetes	382 (100%)	3 (9%)	346 (91%)
Hypertension	916 (100%)	103 (11%)	813 (89%)
Hypercholesterolemia	45 (100%)	11 (24%)	34 (76%)

4.3.2 COMPLICATIONS

The complications of NCD are described in Table 4.9. Nephropathy was the most common complications followed by cardiac diseases.

Table 4.9 Complications

CONDITIONS	Percentage
Renal diseases	
Chronic Renal Failure	15 (1.5%)
Albuminuria	51 (5.2%)
Elevated Creatinine level	11 (1.1%)
Cardiac diseases	
Coronary Heart Disease	11 (1.1%)
Heart Failure	13 (1.3%)
Peripheral Arterial Disease	5 (0.5%)
CVA / TIA	14 (1.4%)
Left Ventricular Hypertrophy	36 (3.7%)
Advance Retinopathy	7 (0.7%)

4.3.3 SCREENING

There were three types of screening done as per Table 4.10 to identify co-morbid conditions: (a) female: cervical screening and breast examination and (b) male: Prostate specific antigen.

Table 4.10 Screening

SCREENING	N
Cervical Screening	189 /657 (28.7%)
Breast Exam	227 /657 (34.5%)
Prostate specific antigen	106/309 (34.3%)

4.3.4 ANNUAL EXAMINATIONS

A number of annual examinations were done for the 968 study participants (Table 4.11).

Table 4.11 Annual examinations

ANNUAL EXAMINATION	Number and (%)
Total Cholesterol	164 (16.9%)
High Density Lipoprotein (HDL)	75 (7.7%)
Triglycerides	134 (13.8%)
Low Density Lipoprotein (LDL)	96 (9.9%)
HBA_1C	100 (10.3%)
Creatinine	100 (10.3%)
Electro Cardio Gram (ECG)	45 (4.6%)
Fundoscopy	129 (13.3%)
Urine Protein	135 (13.9%)
Urine Test	384 (39.6%)
Foot Exam	605 (62.5%)
Oedema	152 (15.7%)
Peak Flow	39 (4.0%)

4.3.5 CLINICAL EXAMINATIONS

The clinical examination of the study participants included measuring blood pressure, weight and blood glucose (Table 4.12).

Table 4.12 Clinical examinations

Clinical examinations	Minimum	Maximum	Mean	Standard deviation
BP Systolic (mmHg)	100	203	140	18
BP Diastolic (mmHg)	10	160	85	10
Weight (kg)	31	164	82	19
Blood Glucose (mmol/l)	4	33	8	3

Twenty-two percent of 968 study participants had blood pressure of more than 140/90mmHg. Twenty percent of study participants had a weight more than 90kg. The blood sugar level of 22% study participants was more than 7 mmol/l.

4.3.6 HEALTH EDUCATION

The following health educations were given to the 968 study participants (Table 4.13)

Table 4.13 Health education

Health education	Number and (%)
Smoking	673 (69.5%)
Diet	869 (89.7%)
Exercise	873 (90.1%)
Alcohol	646 (66.7%)
Medications/Adherence	707 (73.0%)

CHAPTER 5

DISCUSSIONS

In this chapter, the results obtained from the analysis of the data were discussed and compared with those from other published studies.

5.1 INTRODUCTION

A cross sectional study was conducted in an urban health district with a purpose of assessing the socio-demographic and clinical profiles of study participants with selected NCD. The focus of the study was on (a) distribution of NCD (i.e. main burden); (b) risk factors (i.e. age, gender, ethnicity, smoking, alcohol, complication and co-morbidity); (c) management of NCD; and implications for hospital management. This study was conducted in Gauteng health facilities during one week of April 2011 (11- 15) April).

5.2 DISTRIBUTION OF NCD OF THE STUDY PARTICIPANTS

The study observed that the selected NCD (i.e. hypertension; diabetes mellitus and hyper-cholesterolaemia) were prevalent in all the study sites. Hypertension was the main burden among the three selected NCD. This picture could mean that the probable factors of the NCD such as (a) underlying socio-economic, cultural, political and environmental determinants; (b) common modifiable risk factors; (c) intermediate risk factors and (d) main chronic diseases were perhaps neglected by the District. The study by Smith (2007) confirms this situation that the district was reported to be experiencing challenges of service delivery in the areas of chronic diseases specifically diabetes and hypertension which was echoed by Mayosi, et al (2009). This scenario from the study highlights the need to pay attention to NCD as a global diseases threat and allocate more resources for management of these conditions in PHC facilities.

The analysis from the findings revealed that more cases were seen in the Zola CHC than other CHCs. The reasons could be perhaps due to higher population density. According to Johannesburg Health Report for financial year 2011/12, there were a higher number of follow-up cases on diabetes and hypertension found in the Sub-district D. This is where Zola CHC is situated. Due to vastness of Sub-district D, this scenario justifies the opening of the new district hospital in Sub-district D (Zola-Jabulani Hospital) to manage the existing complications of chronic diseases which might be beyond Zola CHC.

5.3 RISK FACTORS OF STUDY PARTICIPANTS WITH SELECTED NCD

5.3.1 AGE DISTRIBUTION

The findings of this study indicated that study participants over the age of 45 years (87%) were more than those that are less than 45 years of age. This means that the District Management should make a concerted effort to target this age group as they would be more vulnerable to unwanted deaths if these selected NCD are not prioritised and controlled. The NCD Alliance (2011) highlighted the importance of health system strengthening with focus on integration of NCD management at PHC level. However, the findings in this study are inconsistent with the study by Alwan, et al (2010) which stated NCD develop at younger ages, and result in premature death. The problem that arises from this inconsistency might be due to younger patients not attending the health facilities and remained undiagnosed. The Johannesburg Health District Management Team should recognise the emerging threat of NCD amongst the younger population and institute targeted screening programme and possible interventions for them.

5.3.2 GENDER

This study found a higher prevalence of selected NCD among male study participants. This could be due to high health seeking behaviours among females than males (Chinnakali, Mohan, Upadhyay, et al, 2012). The management of JHB Health District would probably need to spend more efforts to attract males through concerted attempts of promoting and marketing 'male friendly' health facilities. Added to the intervention; females need to be motivated to sustain coming to PHC facilities for regular assessment for NCD through health education and promotion.

5.3.3 ETHNICITY

The majority of study participants were Blacks. The catchment population of the selected CHCs were located in Black Township. However, there was one facility located in the suburbs which was part of the study. This outlook of ethnic difference in response to the results indicates that Whites, Coloureds and Asians are probably using other alternatives to manage their NCD or they go directly to other levels of health care.

5.3.4 SMOKING AND ALCOHOL

Smoking and alcohol are modifiable risk factors that contribute to the commencement of NCD. This study found non-smokers and non-alcohol drinkers were also affected by the selected NCD, which might be due to under-reporting or other confounding variables. Puoane, Tsokeli, Sanders, et al (2008) proposed that successful NCD control would require strong effective service approach, health promotion and prevention. For modifiable risk factors such smoking and alcohol drinking, the WHO (2010b) recommend the multi-pronged approaches to prevent and alter these as interventions. It is therefore necessary that Johannesburg Health District should adopt the WHO STEPwise Framework for NCD Risk Factor Surveillance in order to source funds for current and

future NCD needs.

5.3.5 CO-MORBIDITY

This study found high prevalence of co-morbid conditions. This indicates that district should offer integrated chronic care clinics and may have to plan extra resources especially if one patient needs to be treated for many health conditions. Abegunde, et al, (2007) highlighted that developing countries health system is functioning at maximum capacity and worsening epidemic of NCD is set to further impose strain on an already overwhelmed system, which might be the situation in the Johannesburg District.

The most prevalent complications among the study cohort were nephropathy and cardiac diseases. This might be due to poor management of these patients and lack of integration of NCD in the PHC system. It might be also due to failure of the health professionals to check co-morbidities problems. Clinical examination by health professionals is an essential component for management and prevention of complications (Steyn, Levitt, Patel, et al, 2008). Moodley and Rambiritch (2007) suggested better management of NCD would require continuous professional development and an up to date knowledge of health professionals about the management of NCD.

5.4 MANAGEMENT OF NCD

5.4.1 CLINICAL EXAMINATIONS

Almost 20% of the study participants had poorly controlled hypertension (blood pressure of more than 140/90 mm Hg), obesity (weight more than 90kg) and diabetes (Blood sugar level more than 7mmol/l). This is of concern and the District management should organise a workshop with all the doctors to improve their clinical management

practices.

5.4.2 SCREENING

Screening detects asymptomatic cases. For this study, screening focused on cancer problems such as female cervical cancer screening, breast cancer screening and prostate specific antigen cancer screening. Few screening tests were reported in this study. This was probably due to lack of agreed tools for screening and interest in early detection of co-morbid conditions. For an example if facilities to conduct mammograms are not available in PHC facilities, it would not be done.

5.4.3 ANNUAL EXAMINATIONS

This study found a low uptake of annual examination for NCD study participants. The WHO STEPwise Framework for NCD Risk Factor Surveillance assists to identify current and future public health needs within the sphere of chronic care. The pinnacle of this framework enhances the essential surveillance of physical and bio-chemical measurements in the management of risk factors (Bonita, De Court, Dwyer, 2001). Regular annual examination is a key to that process. However, the findings of study indicated that annual examinations were less prioritised. This means that the district is putting minimal efforts to provide examinations of potential risk factors for NCD.

5.4.4 HEALTH EDUCATION

Health education was given priority in the JHB Health District as more study participants received some form of education on NCD management. This study's finding contradicts the findings from other studies which reported failure of health facilities to provide with appropriate health education at the health facilities (Moodley and Rambiritch, 2007; Mayosi, Flisher, Lallo, et al, 2009). The District is probably doing a good job in providing

health education on NCD and this practice need to preserved and effected with every patient encounter.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

In this chapter, the recommendations obtained from this study were assessed in relation to the aims and objectives of the study so that appropriate conclusions can be drawn. The limitations of the study are listed. Based on the findings of the study, appropriate recommendations and suggestions for future research are included.

6.1 CONCLUSIONS RELATED TO THE AIMS OF THE STUDY

This was a cross-sectional study assessment of selected NCD at five community health centres in JHB Health District during one week study period in 2011. Nine-hundred and sixty eight study participants were recruited for the study during this period.

6.1.1 DESCRIPTION OF THE CLINICAL PROFILES OF PATIENTS

Among the study participants, the prevalence of hypertension (94.6%) was highest followed by diabetes (39.4%) and hyper-cholesterolaemia (4.6%). A number of subjects had comorbidity associated with all three conditions. The complications among the study participants include nephropathy, cardiac diseases and retinopathy. Annual screening was done for a number of study participants but it was erratically done so that all study participants were not screened. More than fifth of the patients had poor controlled hypertension (blood pressure of more than 140/90 mm Hg), diabetes (Blood sugar level more than 7mmol/l) and obesity (weight more than 90kg).

6.1.2 DESCRIPTION OF THE SOCIO-DEMOGRAPHIC AND CLINICAL PROFILES OF

STUDY PARTICIPANTS ATTENDING THESE CHCs

The majority of the study participants were 45 years and above (88%), female (53%), and black (98%); There were no significant association between these three conditions and risk factors such as smoking and alcohol drinking.

6.2 LIMITATIONS OF THE STUDY

The following limitations were encountered during the study period

(a) Incomplete data- which was addressed by checking patients' clinical records.

(b) Completing the Integrated Chronic Disease patient form by nursing staff was a major challenge due to time constraints.

6.3 RECOMMENDATIONS

6.3.1 FOLLOW-UP

This study found NCD passport as a useful monitoring tool and should be introduced to all the health facilities in a phased manner.

This study highlighted the poor patient management associated with failure to screen, ability to handle co-morbidities and to minimize complications of NCD. The District Management should address this issue by organising workshops with the clinical staff in these facilities and share the findings of this study.

6.3.2 FUTURE RESEARCH

The future research recommendation for District Management Team is:

(a) To conduct similar studies in all health facilities for a longer duration.

(b) To investigate the referral system within NCD to manage comorbidity and complications associated with NCD.

(c) To investigate cost of managing NCD

6.4 CONCLUSION

This study focussed on socio-demographic and clinical profiles of Johannesburg Health District's selected NCD in five CHCs. Similar study was never conducted in JHB and thus its uniqueness to advance the knowledge of NCD in Gauteng Province, Johannesburg Health Management and the rest of the world. The areas needing attention include the reasons for the rising NCD especially diabetes mellitus and hypertension and the low tracking of cholesterol problems.

REFERENCES

Alberti H, Boudriga N, Nabli M. 2007. DammSokkor: Factors associated with the quality of care of patients with Diabetes. A study in primary care in Tunisia, Diabetes Care.30 (8):2013-2018

Alwan A. 2008. WHO action plan for the global strategy for the prevention and control of noncommunicable diseases. Geneva: World Health Organization.

Alwan A, Maclean DR, Riley LM, d'Espaignet ET, Mathers CD, Stevens GA, Bettcher D. 2010. Monitoring and surveillance of chronic non-communicable diseases: progress and capacity in high-burden countries. The Lancet 376(9755):1861-1868.

Abegunde DO, Mathers CD, Adam T, Ortegon M, Strong K. 2007. The burden and costs of chronic diseases in low-income and middle-income countries. The Lancet 370(9603):1929-1938.

BaradaranH, and Knill-Jones R. 2004. Assessing the knowledge, attitudes and understanding of type 2 diabetes amongst ethnic groups in Glasgow,Scotland. PractDiabInt 21 (4): 143-148.

Bonita R, De Court, Dwyer T, Jamrozik K, Winkelmann R. 2001. Surveillance of risk factors for noncommunicable diseases: the WHO STEPwise approach: summary. Geneva: WHO.

Brown JB, Harris SB, Webster-Bogaert S, Wetmore S, Faulds C , Stwerat M. 2002. The role of patient, physician and systemic factors in the management of type 2 diabetes mellitus. Family practice 19: 344-349.

Chinnakali P1, Mohan B, Upadhyay RP, Singh AK, Srivastava R, Yadav K. 2012. Hypertension in the elderly: prevalence and health seeking behavior. N Am J Med Sci, 4(11):558-62.

Gauteng Department of Health. 2008. Health in Gauteng: Status report. Johannesburg: Gauteng Department of Heath.

Gauteng Department of Health and Social Development. 2009. Gauteng Department of Health and Social Development Strategic Plan 2009-2014.

Jamison DT, Joel G. Breman JG, MeashamAr, et al. Editors. 2006. Disease control priorities in developing countries. Washington DC: World Bank.

Johannesburg Heath District.2012. Johannesburg District Health Report 2011/2012. Johannesburg: DoH.

Mayosi BM, Flisher AJ, Lalloo UG, Sitas F, Tollman SM, Bradshaw D. 2009. The burden of non-communicable diseases in South Africa. The Lancet; 374(9693):934-947.

Moodley LM and Rambiritch V. 2007. An assessment of the level of knowledge about diabetes mellitus among diabetic patients in a primary healthcare setting., SA FamPract, 49(10), 16a-16d.

National Department of Health. 2006. Non-Communicable Diseases Strategic Vision. Johannesburg: Government Publishers.

National Department of Health.2010a. National Department of Health Medium Term Strategic Plan 2010/11-2012/13. Pretoria: Government Publishers.

National Department of Health 2010b.Negotiated Service Delivery Agreement. Pretoria: Government Publishers.

National Department of Health. 2011. Health Minister calls for more emphasis on prevention of diseases. http://www.doh.gov.za/docs/pr/2011/pr0429.html [accessed 01/05/2011]

NCD Alliance. 2011. NCD Alliance Plan. <http://ncdalliance.org/> [accessed 20/04/2011]

NCSS. 2007. NCSS Statistical software. <http://www.ncss.com> [accessed 31/10/2013]

Puoane T, Tsokeli L, Sanders D, Parker W. 2008. Chronic Non-Communicable Diseases, in South African Health Review, Chapter 5, pp. 73-87. Durban: Health Systems Trust.

Simmons D Lillian S, Swan J, Haar J. 2007. Discordance in perceptions of barriers to diabetes care between patients and primary care and secondary care, Diabetes care 30: 490-495.

Smith C. 2007. Service provision for diabetes and hypertension at the primary level in the Johannesburg metropolitan area. [Research report] Johannesburg: University of the Witwatersrand.

Statistics South Africa. 2007. South African Statistics. http://beta2.statssa.gov.za/ [accessed 31/10/2013]

Steyn K, Levitt NS, Patel M, Fourie J, Gwebushe N, Lombard C, Everett K. 2008. Hypertension and diabetes: Poor care for patients at community health centres,JEMDSA 13(2) : 64-70.

Sutton M , McLean G. 2006. Determinants of primary medical care quality measured under the new UK contract: cross sectional study.BMJ 332:389-390.

UNO. 2010. Proceedings of the General Assembly Sixty-fourth session. 86th plenary meeting. 13 May 2010. New York. New York: UNO.

World Health Organization.2010a. Chronic Diseases and their common risk factors - Facing the facts #1. Geneva: World Health Organization.

World Health Organization. 2010b. Chronic Diseases in low- and middle-income countries - Facing the facts #3. Geneva: World Health Organization.

APPENDICES

APPENDIX A: ETHICS CLEARANCE CERTIFICATE AND LETTERS OF APPROVAL

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Modise Elias Makhudu

CLEARANCE CERTIFICATE	M110811
PROJECT	Assessment of Selected Non-Commuicable Dieases in an Urban Health District of South Africa
INVESTIGATORS	Modise Elias Makhudu.
DEPARTMENT	School of Public Health
DATE CONSIDERED	26/08/2011
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Dr D Basu

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...

health and social development
Department: Health and Social Development
GAUTENG PROVINCE

HEALTH AND SOCIAL DEVELOPMENT
JOHANNESBURG METRO

Enquiries:Benny Sikhakhane
Hillbrow CHC
Private Baxg X21, JHB, 2001
Tel:011 694 3715
Fax: 011 694 3826
E-mail :Bernard.Sikhakhane@gauteng.gov.za

To: Mr. M Makhudu

Date: 3 May 2011

RE: **REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT JOHANNESBURG METRO DISTRICT RESEARCH TITLE: ASSESSMENT OF SELECTED NON-COMMUNICABLE DISEASES (NCDs) IN AN URBAN HEALTH DISTRICT IN SOUTH AFRICA**

Dear Mr. Makhudu

Permission is granted to the researcher to access data for the purpose of conducting the above mentioned study. This approval is limited to compliance with the terms and conditions stipulated in the Gauteng Department of Health (GDOH) Research Policy and that the Researcher will submit the Ethics Committee clearance certificate before undertaking the research.

The researcher is expected to provide progress reports and address any queries to the Deputy Director: Monitoring and Evaluation.

Mr. B Sikhakhane
Deputy Director: Monitoring and Evaluation, Johannesburg Metro

health and
social development
Department: Health and Social Development
GAUTENG PROVINCE

Enquiries: Ms. S. Twala
Tel: (011) 355 3477
19th April 2011

To: Chair of the Ethics Committee
University of Witwatersrand's Ethics Committee

Dear Sir/Madam

RE: REQUEST FOR PERMISION REQUEST TO CONDUCT A RESEARCH STUDY AT JOHANNESBURG METRO DISTRICT BY MR MODISE MAKHUDU

The department received a request from Mr. M. Makhudu for permission to conduct a research study in the Johannesburg Metro District. The study is entitled ***"Assessment of selected Non-Communicable Diseases (NCDs) in an urban health district in South Africa"***. The department has no objection to this study provided it has been granted Ethics Clearance by an NHREC accredited committee.

We therefore request that you review his proposal and provide ethical clearance, and then we will grant final permission.

Yours
Sincerely

Sue le Roux
DIRECTOR: POLICY, PLANIING AND RESEARCH
Date: 20/04/2011

APPENDIX B: DATA COLLECTION TOOL

NCD PASSPORT

PERSONAL DETAILS

NAME:

LABORATORY REFERENCE STICKER:

DATE OF BIRTH: GENDER: M / F

PATIENT NUMBER: HEIGHT [m]

CURRENT DISEASES

Year diagnosed	Disease			Year diagnosed	Disease
	Diabetes				COPD
	Hypertension				Asthma
	Epilepsy				HIV
	Rheumatic Heart Disease	Penicillin prophylaxis	No / Yes		Other

Integrated Chronic Disease Map

MAJOR RISK FACTORS

Age (yr)	< 44 [0]	45-54 [2]	55-63 [3]	>64 [4]	Hypertension	No [0]	Yes [1]		Alcohol	No / Yes
Diabetes	No [0]	Yes [1]			High Cholesteral	No	Yes		Waist Circumference [Male >102/ Female>88cm]	
Family: Ischeamic Heart	No [0]	2nd gen [3]	1st gen [5]		Smoker	No	Yes			

ASSOCIATED CLINICAL CONDITIONS

	Chronic Renal Disease		Coronary Heart Disease		Peripheral Arterial Disease
	Advanced Retinopathy		Heart Failure		CVA or Transient Ischeamic Attack

TARGET ORGAN DAMAGE

	Left Ventricular Hypertrophy [ECG]		Albuminuria [microscopy]		Elevated Creatinine [M=115-133, W=107-124]

SCREENING

	Cervical Screening		Breast Exam		PSA

ANNUAL EXAMINATION

	Cholesteral		Trigs		HBA_1C	<7.5	7.5-9.5	>9.5	Fundoscopy [eye]	
	HDL		LDL		Creatinine				Urine Protein (PCR)	

Date [dd/mm/yy]	BloodPressure	Weight [kg]	Waist [cm]		Body mass index			Blood Glucose		Urine Test	Foot Exam	Oedema	Seizures freq/pm	Epilepsy Bloods	Peak Flow	Smoking		Diet (Fruit & vegetables)	Exercise		Education given						*FINDRISC SCORE	Comments	Sign
			M<93 F<79 [0]	M:94-101 F:80-87 [3]	M>102 F>88 [4]	<25 [0]	25.1-29.9 [1]	>30 [3]	<7.0	>7.1							~~Y~~	Yes	daily [0]	not daily [1]	>30 min day [0]	no [2]	Smoking	Diet	Exercise	Alcohol	Inhaler	Meds/ Advance			

*FINDRISC SCORE: <7 -LOW RISK; 7-11 -SLIGHTLY ELEVATED RISK; 12-14 -MODERATE RISK; 16-20 -HIGH; >20 VERY -HIGH RISK

ASSESSMENT OF SELECTED NON-COMMUNICABLE DISEASES IN AN URBAN HEALTH DISTRICT OF SOUTH AFRICA

MODISE ELIAS MAKHUDU

A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Public Health in the field of Hospital Management

October, 2014

DECLARATION

I, Modise Elias Makhudu, declare that this research report is my own work. It is being submitted for the degree of Master Public Health in the field of Hospital Management at the University of the Witwatersrand, Johannesburg, South Africa. It has not been submitted before any degree or for any examination at this stage or any other University.

_____ _____

Modise Elias Makhudu **Date**

DEDICATION

All people working diligently to control the scourge of Non Communicable Diseases.

ACKNOWLEDGEMENT

I would to a great extent express my unassuming appreciation to the following

people who made it certain that the study is completed.

- Dr Debashis Basu as a supervisor, mentor and a coach;
- Dr. Jacqui Mendes for unconditional technical support and guidance;
- Ms Sue Le Roux for assistance in getting approval from Gauteng Department of Health to conduct the study in health facilities;
- Ms Dudu Dube for organizing data collection and administration thereof;
- Personnel especially nurses from the Johannesburg health facilities where the study was conducted;
- Mr. Benny Sikhakhane and Ms. Mokgadi Mafojane for support with health information of Johannesburg Health District;
- Ms Erika Du Plooy for working many long hours in capturing the data.

ABSTRACT

Background: The World Health Organization predicts that the deaths related to Non-Communicable Diseases in Africa will rise by 27% over the next decade. As a response to the problem, the National Department of Health in South Africa

introduced interventions that focussed on implementing health facility based Non-Communicable Diseases register and a monitoring tool. The Gauteng Department of Health in South Africa started introducing the monitoring tool in public health facilities since April 2011 in a phased manner. This study used a one week data collected in the month of April 2011 in selected health facilities within the Johannesburg Health District.

Aim: To describe the socio-demographic and clinical profiles of the study population attending the health facilities in Johannesburg Health District.

Methodology: A cross-sectional study design was used for the study. The data was collected from the selected Community Health Centres using the monitoring tool developed by the National Department of Health. The data were collected for a week from randomly selected health facilities in 2011.

Results: Nine-hundred and sixty eight study participants were recruited from the five community health centres for the assessment of non-communicable diseases. Among the study participants, the prevalence of hypertension (94.6%) was highest followed by diabetes (39.4%) and hyper-cholesterolaemia (4.6%). A number of study participants had comorbidity associated with all three conditions. The majority of them were 45 years and above (88%), female (53%), and black (98%); There were no significant association between these three conditions and risk factors such as smoking and alcohol drinking. The complications among the study participants include nephropathy, cardiac diseases and retinopathy. Annual screening was done for a number of study participants but it was erratically done so that all study participants were not screened. Twenty-two percent of 968 study participants have blood pressure of more than 140/90mmHg. Twenty percent of study participants have a weight more than 90kg. The sugar level of 22% study participants was more than 7mmol/l.

Conclusion: The NCD monitoring tool could be used as an effective tool for management of NCD in PHC setting like Johannesburg Health District.

TABLE OF CONTENTS

DECLARATION ii
DEDICATION iii
ACKNOWLEDGEMENT iii
ABSTRACT iv
TABLE OF CONTENTS vi
LIST OF FIGURES ix
LIST OF TABLES x

LIST OF ABBREVIATIONS xii
CHAPTER 1 ..... - 1 -
1.1 BACKGROUND ..... - 1 -
1.2 JUSTIFICATION FOR THE STUDY ..... - 2 -
1.3 RESEARCH QUESTION ..... - 2 -
1.4 STUDY OBJECTIVES ..... - 3 -
1.4.1 BROAD OBJECTIVE ..... - 3 -
1.4.2 SPECIFIC OBJECTIVES ..... - 3 -
1.5 FOLLOWING CHAPTERS ..... - 3 -
CHAPTER 2 ..... - 5 -
2.1 INTRODUCTION ..... - 5 -
2.1.1 INTERNATIONAL CONTEXT OF NON-COMMUNICABLE DISEASES ..... - 5 -
2.1.2 INTERNATIONAL RECOMMENDED INTERVENTIONS FOR NON-COMMUNICABLE DISEASES ..... - 6 -
2.2 SOUTH AFRICAN CONTEXT FOR NON-COMMUNICABLE DISEASES ..... - 8 -
2.3 NCD PREVALENCE IN THE JOHANNESBURG HEALTH DISTRICT ..... - 9 -
2.4 SUPPORTIVE POLICY FRAMEWORKS ..... - 10 -
2.5 FACTORS INFLUENCING MANAGEMENT OF NCD ..... - 12 -
2.5.1 PATIENT RELATED FACTORS ..... - 12 -
2.5.2 HEALTH CARE PROFESSIONAL FACTORS ..... - 13 -
2.5.3 HEALTH SYSTEM FACTORS ..... - 13 -
CHAPTER 3 ..... - 14 -
METHODOLOGY ..... - 14 -
3.1 STUDY DESIGN ..... - 14 -
3.2 STUDY SETTING ..... - 14 -
3.3 STUDY SCOPE ..... - 16 -
3.4 STUDY PERIOD ..... - 16 -
3.5 STUDY POPULATION AND SAMPLING ..... - 16 -
3.6 DATA MANAGEMENT ..... - 17 -
3.6.1 VARIABLES ..... - 17 -
3.6.2 DATA COLLECTION ..... - 17 -
3.6.3 DATA ANALYSIS ..... - 17 -

3.7 ETHICAL CONSIDERATIONS ..... - 18 -
CHAPTER 4 ..... - 19 -
RESULTS ..... - 19 -
4.1 STUDY PARTICIPANTS ..... - 19 -
4.2 SOCIO-DEMOGRAPHIC PROFILE ..... - 21 -
4.2.1 AGE DISTRIBUTION ..... - 21 -
4.2.2 GENDER DISTRIBUTION ..... - 22 -
4.2.3 ETHNICITY ..... - 23 -
4.3 CLINICAL PROFILE ..... - 24 -
4.3.1 RISK FACTORS ..... - 24 -
4.3.2 COMPLICATIONS ..... - 25 -
4.3.3 SCREENING ..... - 25 -
4.3.4 ANNUAL EXAMINATIONS ..... - 26 -
4.3.5 CLINICAL EXAMINATIONS ..... - 26 -
4.3.6 HEALTH EDUCATION ..... - 27 -
CHAPTER 5 ..... - 28 -
DISCUSSIONS ..... - 28 -
5.1 INTRODUCTION ..... - 28 -
5.2 DISTRIBUTION OF NCD OF THE STUDY PARTICIPANTS ..... - 28 -
5.3 RISK FACTORS OF STUDY PARTICIPANTS WITH SELECTED NCD ..... - 29 -
5.3.1 AGE DISTRIBUTION ..... - 29 -
5.3.2 GENDER ..... - 30 -
5.3.3 ETHNICITY ..... - 30 -
5.3.4 SMOKING AND ALCOHOL ..... - 30 -
5.3.5 CO-MORBIDITY ..... - 31 -
5.4 MANAGEMENT OF NCD ..... - 31 -
5.4.1 CLINICAL EXAMINATIONS ..... - 31 -
5.4.2 SCREENING ..... - 32 -
5.4.3 ANNUAL EXAMINATIONS ..... - 32 -
5.4.4 HEALTH EDUCATION ..... - 32 -
CHAPTER 6 ..... - 34 -
6.1 CONCLUSIONS RELATED TO THE AIMS OF THE STUDY ..... - 34 -

6.1.1 DESCRIPTION OF THE CLINICAL PROFILES OF PATIENTS ..... - 34 -
6.1.2 DESCRIPTION OF THE SOCIO-DEMOGRAPHIC AND CLINICAL PROFILES OF STUDY PARTICIPANTS ATTENDING THESE CHCs ..... - 34 -
6.2 LIMITATIONS OF THE STUDY ..... - 35 -
6.3 RECOMMENDATIONS ..... - 35 -
6.3.1 FOLLOW-UP ..... - 35 -
6.3.2 FUTURE RESEARCH ..... - 36 -
6.4 CONCLUSION ..... - 36 -
REFERENCES ..... - 37 -
APPENDICES ..... - 41 -
APPENDIX A: ETHICS CLEARANCE CERTIFICATE AND LETTERS OF APPROVAL ..... - 42 -
APPENDIX B: DATA COLLECTION TOOL ..... - 46 -

LIST OF FIGURES

Figure 2.1: Causes of Chronic Diseases ..... - 7 -
Figure 2.2: World Health Organization STEPwise – Non communicable Diseases Risk factors concept ..... - 8 -
Figure 3.1 Gauteng Province ..... - 15 -
Figure 4.1 Study participants (n = 968) ..... - 19 -
Figure 4.2 Age distribution of study participants ..... - 22 -

LIST OF TABLES

Table 2.1 Prevalence of Diabetes Mellitus in 7 Sub-districts in Johannesburg ..... - 9 -
Table 2.2 Prevalence of hypertension in 7 Sub-districts in Johannesburg ..... - 10 -
Table 2.3 South African National Guidelines on NCD ..... - 11 -
Table 3.1 List of variables ..... - 17 -
Table 4.1 Number of study participants per disease ..... - 20 -
Table 4.2 co-morbidity of diseases ..... - 20 -
Table 4.3 Age distribution of three disease cohorts ..... - 21 -
Table 4.4 Age distribution ..... - 22 -
Table 4.5 Gender ..... - 23 -
Table 4.6 Ethnicity ..... - 23 -
Table 4.7 Smoking ..... - 24 -
Table 4.8 Alcohol ..... - 24 -
Table 4.9 Complications ..... - 25 -
Table 4.10 Screening ..... - 25 -
Table 4.11 Annual examinations ..... - 26 -
Table 4.12 Clinical examinations ..... - 27 -
Table 4.13 Health education ..... - 27 -

GLOSSARY OF TERMS

Assessment refers to the measure of the extent of something and the degree to which action or policy is carried out.

Hypertension patients for follow-up: Patients are diagnosed, put on treatment and regularly visit the health facility to check compliance and control of the hypertension (source: DHIS, 2010)

Hypertension patients on treatment: Number of clients initiated on hypertension treatment for the first time (source: DHIS, 2010)

Hypertension patients on register: All patients who have controlled or no controlled hypertension put on register or some of records. (source: DHIS, 2010)

Diabetes patients for follow-up: Patients are diagnosed, put on treatment and regularly visit the health facility to check compliance and control of the diabetes (source: DHIS, 2010)

Diabetes patients on treatment: Number of clients initiated on diabetes treatment for the first time (source: DHIS, 2010)

Diabetes patients on register: All patients who have controlled or no controlled diabetes put on register or some of records. (source: DHIS, 2010)

Health district is defined as geographic area that is small enough to allow maximal involvement of the community so that local health needs are met, but also large enough to effect economies of scale (Department of Health, White paper on transformation of Health System in South Africa, 1997).

Selected NCD is hypertension, diabetes, and hypercholesterolemia

Co-morbidity refers to simultaneous occurrence of two or more diseases. Example of

chronic diseases co-morbidity include: (1) the association between chronic obstructive pulmonary disease and cancer. (Source: Chronic diseases and their risks factors: a global burden)

Urban is an area that is characterized by higher population density and vast human features in comparison to areas surrounding it.

LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
BMI	Body Mass Index
CHCs	Community Health Centres
DHIS	District Health Information System
HIV	Human Immunodeficiency Virus
JHB	Johannesburg
ID	Identity document
MDG	Millennium Developmental Goals
NCD	Non-Communicable Diseases
NDoH	National Department of Health
NSDA	Negotiated Service Delivery Agreement
PHC	Primary Health Care
NCSS	A statistical analysis and graphics software package that outputs graphics from spreadsheet, database, and statistical files for use with popular word processors and presentation software.
SEMDSA	The Society for Endocrinology, Metabolism and Diabetes of South Africa
SD	Standard deviation
UN	United Nations
WHO	World Health Organisation
WITS	University of the Witwatersrand

CHAPTER 1

INTRODUCTION

The purpose of this study was to assess the selected Non-Communicable Diseases in an urban health district of South Africa. This introductory chapter will cover the background to the study, statement of the problem, its aims and objectives and an outline of subsequent chapters.

1.1 BACKGROUND

During the last decade, non-communicable diseases (NCD) had been getting much attention due to increasing prevalence, morbidity and mortality associated with them not only in developed but also in developing countries. It is estimated that 58% of all deaths worldwide were contributed to NCD in 2008 (Alwan, MacLean, Riley, 2010). These diseases are generally regarded as disease of the affluent. The WHO predicts that the deaths related to NCD in Africa will rise by 27% over the next decade (Alwan, 2008).

Despite the mortality, morbidity and the burden of the NCD, the conditions had eluded the health list of priorities. The NCD did not feature in the MDG of the United Nations. However, the situation had changed during last few years. In 2010, the United Nations General Assembly passed a resolution on its 86th plenary session for prevention and control of non-communicable diseases. The Assembly also unanimously adopted a resolution by which it decided to convene a high-level meeting on "*Prevention and control of non-communicable diseases"* in September 2011 due to high prevalence of NCD in both developed and developing countries (UNO, 2010).

The South African Minister of Health also highlighted the challenges associated with high burden of NCD in South Africa at the First Global Conference on Healthy Lifestyles and NCD Control held in Moscow in 2011 (Department of Health, 2011). Recently, the

NCD cluster within the National Department of Health had introduced a number of measures for prevention and control of NCD as well as collected accurate information about the burden of NCD in South Africa. This included a NCD register for keeping records of NCD patients at the clinic as well as a NCD monitoring tool called NCD passport (Appendix B) to record individual patient details.

1.2 JUSTIFICATION FOR THE STUDY

The Gauteng Province has one of the highest burdens of NCD in the country (Gauteng Department of Health, 2008). Therefore, the Gauteng Department of Health has decided to monitor closely the prevalence and the clinical management of NCD through its five districts (namely Ekurhuleni, Johannesburg, Sedibeng, Tshwane and West Rand). As a part of that process, the district offices are expected to monitor routinely the DHIS data on NCD, which were not often done optimally. In addition, the districts were asked to introduce the NCD register and NCD passport (a monitoring tool) as disease management tools in the public health facilities. The study sought to describe the socio-demographic and clinical profiles of the patients attending the health facilities in Johannesburg Health District. The three selected NCD (Hypertension, Diabetes and Hypercholesterolemia) were chosen based on their common etio-pathology. They are also the commonest conditions seen in the public health facilities in South Africa.

The findings from this study would hopefully assist the District Management Team to understand the burden of the NCD and the associated clinical management of these diseases in the District.

1.3 RESEARCH QUESTION

What are the socio-demographic and clinical profiles of study participants with selected NCD attending the health facilities in the Johannesburg Health District?

1.4 STUDY OBJECTIVES

1.4.1 BROAD OBJECTIVE

To describe the socio-demographic and clinical profiles of study participants with selected NCD attending public health facilities in the Johannesburg Health District during the one week period in 2011.

1.4.2 SPECIFIC OBJECTIVES

1. To describe the socio-demographic profile (age, gender and ethnicity) of study participants with selected NCD (Diabetes, Hypertension and hypercholesterolemia) during one week study period.
2. To describe the clinical profile (such as type of diseases) of the same study participants.

1.5 FOLLOWING CHAPTERS

The background to the research has been outlined and discussed. Subsequently, research question and objectives were defined in this first chapter. A brief outline of the following chapters is described below.

Chapter Two: Literature Review: The purpose of the literature review is to review related literature and to discuss concepts related to socio-demographic and clinical profiles of study participants with NCD.

Chapter Three: Research Methodology: The chapter describes the research methodology, study design, setting and scope and data management techniques used in this study.

Chapter Four: Presentation of Results: This chapter deals with an analysis of the data collected for this study relating to its aim and objectives.

Chapter Five: Discussion: The findings from the review of the literature are included in this chapter with the results obtained from the analysis in order to address the aims and objectives of the study.

Chapter Six: Conclusions and Recommendations: The chapter is the last part of the report and derives conclusions from the research related to the objectives of this study, makes recommendations and highlights the areas for future research in the field of NCD.

CHAPTER 2

LITERATURE REVIEW

This chapter discusses the appropriate and relevant literature on the socio-demographic and clinical profiles of study participants with NCD. In addition to published literature, information from various unpublished sources is also reviewed.

2.1 INTRODUCTION

2.1.1 INTERNATIONAL CONTEXT OF NON-COMMUNICABLE DISEASES

In 2008, 58% of all deaths worldwide (approximately 33 million) were related to non-communicable diseases (Alwan, et al, 2010). The Non-Communicable Disease (NCD) more specifically includes cardiovascular disease, diabetes, cancer, and chronic respiratory diseases (Abegunde, Mathers, Adam, et al, 2007).

Non-communicable diseases are generally regarded as a disease of the affluent. This misconception, is refuted as 80% of total NCD-related deaths occur in low and middle income countries (Alwan, et al, 2010). The deaths related to NCD in Africa could rise by 27% over the next decade (NCD alliance, 2011).The chronicity of NCD results in extensive mortality and morbidity. In developing countries, NCD develop at younger ages, and result in premature death (Alwan, et al, 2010). The economic burden that these diseases impose, on the individual and the health system, cannot be ignored (WHO, 2010a).

Despite the mortality and morbidity, and the significant worldwide burden, NCD have eluded the public health list of priorities. In 2000, NCD did not feature amongst the eight Millennium Development Goals identified by the United Nations. This may have dictated the limited funding focussed on it. The Centre for Global Development reported that

less than three percent of the US$22 billion spent on health, by international aid agencies in lower middle income countries, is spent on NCD (NCD alliance, 2011).

Fortunately, World Leaders in May 2010 resolved to hold a United Nations Summit on NCD, which was held in September 2011 in New York. The NCD Alliance Partners have taken the lead in ensuring that world leaders commit to specifically identified priorities on relevant agenda developed by a participatory effort of stakeholders' worldwide (NCD alliance, 2011).

2.1.2 INTERNATIONAL RECOMMENDED INTERVENTIONS FOR NON-COMMUNICABLE DISEASES

In many developing countries the health system is functioning at maximum capacity. A worsening epidemic of NCD is set to further impose on an already overwhelmed system (Abegunde, et al, 2007). The NCD Alliance, among its many suggestions has highlighted the importance of health system strengthening (HSS) with a particular focus on primary health care (PHC) addressing the integration of NCD management at this level. The basis of successful NCD control relies strongly on effective service approach, health promotion and prevention (Puoane, Tsokeli, Sanders, et al, 2008).

NCD have complex aetiologies; social-economic, environmental, cultural, biological determinants of health all play a role in the disease development (Figure 2.1). For this reason multi-pronged approaches to prevent and alter the modifiable risk factors are recommended for interventions (WHO, 2010b)

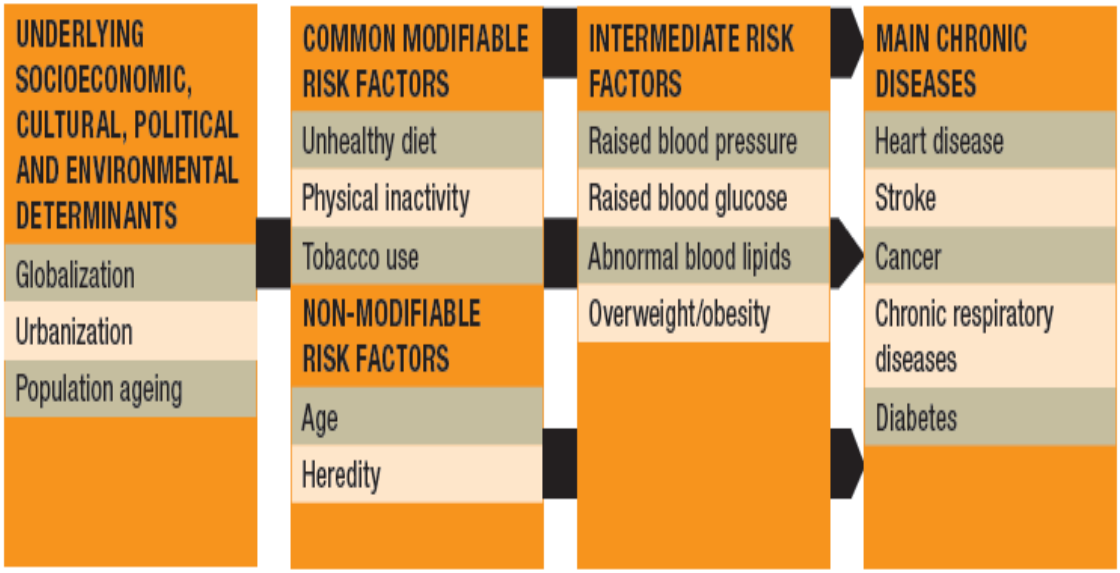


Figure 2.1: Causes of Chronic Diseases

Source: NCD Alliance, 2011

Disease Control Priorities Project in 2006 listed a set of priority interventions identified as cost-effective and affordable to implement in various settings. These included supporting and education of populations to increase physical activity, improve diets, relevant social marketing and facilitating healthy lifestyle decisions. The development of sustainable surveillance systems that monitor weight and height, physical activity, and key dietary variables is a key intervention and a focus of this study (Jamison, Breman, Measham, et al. 2006).

The WHO STEPwise Framework for NCD Risk Factor Surveillance (Figure 2.2) was expected to assist DoH in resource poor settings to identify current and future public health needs within the sphere of chronic care. The pinnacle of this framework should enhance the essential surveillance of physical and bio-chemical measurements in the management of risk factors (Bonita, De Court, Dwyer, 2001).

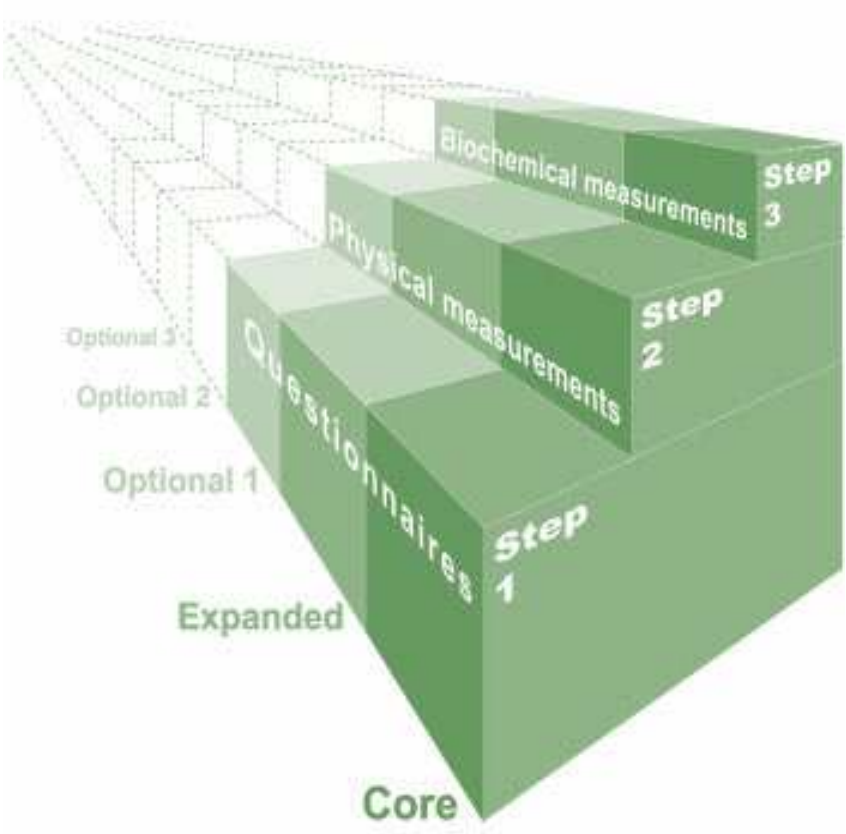


Figure 2.2: World Health Organization STEPwise – Non communicable Diseases Risk factors concept

Source: (Bonita, et al, 2001)

2.2 SOUTH AFRICAN CONTEXT FOR NON-COMMUNICABLE DISEASES

South Africa is contextualised within an epidemiological transition, and endures a quadruple burden of disease, with a high prevalence of communicable diseases, maternal and child health disorders, injury-related mortality and morbidity and NCD. With this in mind, it is not surprising that the importance of NCD prevention and management has gone unnoticed (Mayosi, Flisher, Lallo, et al, 2009). This created a significant negative on health outcomes in South Africa which was evidenced by data from 2004, where one-quarter of all disability-adjusted life years were attributed to NCD, more specifically 12% due to cardiovascular diseases, diabetes mellitus, respiratory diseases and cancers and in the same year one-fifth of total mortality was related to

NCD (National Department of Health, 2010).

The prevalence of NCD is set to increase, as South Africans continue to adopt sedentary lifestyles and unhealthy diets; and the life expectancy of HIV and AIDS patients increases with the advent of an enhanced Anti-Retroviral Therapy Programme. For this reason, Mayosi et al (2003) in the South African Lancet series have echoed the sentiments of the NCD Alliance, by calling for attention into health system strengthening to meet the increased demand for good quality chronic care.

2.3 NCD PREVALENCE IN THE JOHANNESBURG HEALTH DISTRICT

The data on diabetes and hypertension is routinely collected from all health facilities in the Johannesburg District. Three indicators are routinely collected for diabetes and hypertension. The District Health Report for 2011/12 showed that more diabetes follow up cases were found in the Sub-district D with the least cases in the Sub-district A. The proportion of follow up cases to treatment of cases was better in the Sub-district A than the Sub-district D (Johannesburg Heath District, 2012).

Table 2.1 Prevalence of Diabetes Mellitus in 7 Sub-districts in Johannesburg

	Totals	Sub-district A	Sub-district B	Sub-district C	Sub-district D	Sub-district E	Sub-district F	Sub-district G
Diabetes follow-up	183,278	3,871	8,970	7,888	85,242	27,897	21,302	28,108
Diabetes on treatment	13,783	1,684	834	433	3,872	1,217	1,499	4,244
Diabetes patients on register	86,373	2,011	5,471	12,329	32,858	177	7,219	26,308

The hypertension follow up cases were found to be more in the Sub-district D (Table

2.2). The proportion of follow up cases to treatment was low in most of the sub-districts (Johannesburg Heath District, 2012).

Table 2.2 Prevalence of hypertension in 7 Sub-districts in Johannesburg

	Totals	Sub-district A	Sub-district B	Sub-district C	Sub-district D	Sub-district E	Sub-district F	Sub-district G
Hypertension on treatment	23,814	1,744	1,959	1,239	4,757	2,073	3,547	8,495
Hypertension follow-up	672,899	27,107	38,448	39,303	314,232	87,359	66,494	99,956
Hypertensive patients on register	334,298	8,632	38,382	60,227	104,661	906	34,781	86,709

2.4 SUPPORTIVE POLICY FRAMEWORKS

With anticipation from the UN Summit on NCD, the political context began to change and to target strategies that would have NCD prevention and control as an outcome. This is essential as the NCD Alliance advocates that governments become accountable and measured on their successes in preventing and managing NCD (NCD Alliance, 2011). The National Department of Health (NDoH) Medium Term Strategic Plan 2010/11-2012/13 among its ten priorities has identified "Mass Mobilisation For Better Health" a commitment of the health sector to enhance prevention and management strategies to mitigate the burden of NCD (National Department of Health, 2010a). Various policies and guidelines were introduced in South Africa since 2006 to manage the emergence of the NCD within the health system. These policies require that all health facilities in South Africa are expected to capture data on the prescribed registers or forms of NCD patients and to clinically manage all NCD as per guidelines and procedures outlined from the policies. The researcher perceives that the burden of NCD is unknown to many health care workers and managers and often the policies with guidelines are not being implemented.

Subsequently, the Negotiated Service Delivery Agreement (NSDA) within the four output areas (namely increasing life expectancy, decreasing maternal and child mortality, combating HIV and AIDS and decreasing the burden of disease from tuberculosis and strengthening health system effectiveness), has spoken to the focus on NCD prevention and management, and increased influx of resources. Improved surveillance of chronic diseases are required and the identification of innovative technologies in the sector, including recruiting and strengthening the capacity of community health workers' involvement in the implementation of the chronic care model (National Department of Health, 2010).

Furthermore, National Guidelines published by the NDoH in 2006 , entitled "Non-Communicable Diseases Strategic Vision" explains the effective management of NCD and the integration all chronic diseases in its treatment in a patient-centred approach alignment of a formation of health public policy (National Department of Health, 2006). Gauteng Department of Health's strategy has aligned itself with national priority and identified prevention and control NCD (Gauteng Department of Health and Social Development, 2009). This strategy included other guidelines as per Table 2.3.

Table 2.3 South African National Guidelines on NCD

Guidelines	**Year**
National Guidelines on Primary Prevention of Chronic Diseases of Lifestyle	2005
National Guideline: Non-communicable Diseases: A strategic Vision	2006
South African Hypertension Guideline	2011
South African Dyslipidaemia Guideline	2012
SEMDSA Guideline for Management of Type 2 Diabetes	2012

With strong leadership and the much needed political focus on NCD as suggested by the NCD Alliance (NCD Alliance, 2011), the time is appropriate to enhance the chronic care at the District. The Johannesburg Health District was reported to be experiencing challenges in service delivery (one of the six building blocks of the Health System) of in the areas of chronic diseases specifically diabetes and hypertension (Smith, 2007).

Hence the development of the Integrated Chronic Disease Map could act as a visual aid and comprehensive tool to simplify NCD prevention and management. The tool allows for risk factor surveillance of both modifiable risk factors (primary prevention), the assurance of appropriate control of biochemical markers (secondary prevention), and lastly investigations and monitoring of target organ damage (tertiary prevention) in a district setting.

2.5 FACTORS INFLUENCING MANAGEMENT OF NCD

Factors influencing management of NCD can be grouped into three main categories namely patient related factors, health professional related factors and health system related factors.

2.5.1 PATIENT RELATED FACTORS

Patient related factors such as knowledge, culture and beliefs influences people's attitude to health, as well as their health seeking behaviour and control of NCD (Baradaran and Knill-Jones, 2004). Patient factors that influence good management of NCD (such as diabetes) include compliance, regular attendance, health education, younger age and female (Alberti, Boudriga, Nabli, 2007). Although health education plays an important role in improving patients' compliance, patients are often not provided with appropriate health education at the health facilities (Moodley and Rambiritch, 2007).

2.5.2 HEALTH CARE PROFESSIONAL FACTORS

Better management of NCD is based on the continuous professional development and an up to date knowledge of health professionals about the management of NCD (Moodley and Rambiritch, 2007). Standardisation of care with the use of clinical guidelines has been shown to improve patient outcomes (Brown, Harris, Webster-Bogaert, et al, 2002).

Thorough clinical examination by health professionals is an essential component for management and prevention of complications (Steyn, Levitt, Patel, et al, 2008). However this requires time and health professionals often compromise that due to increased work load as a result of staff shortages. Other health care professional related factors identified included numbers of health care staff, their training, health care professional motivation (Sutton, McLean, 2006; Simmons, Lillian, Swan, et al, 2007).

2.5.3 HEALTH SYSTEM FACTORS

The clinical management of NCD requires good organisational systems which provide an efficient and effective management of resources such as drug, equipment (Brown, et al, 2002). The availability of innovative tools such as defaulter tracing and reminder systems could assist in achieving better control. Other health system related factors found to influence NCD care include the presence of dedicated NCD clinics, availability of clinical guidelines, and health (Alberti, et al, 2007).

CHAPTER 3

METHODOLOGY

The methodology for this study was selected on the basis of its aims and objectives. In this chapter the following were/would be discussed: setting, scope, and study design and research tools.

3.1 STUDY DESIGN

This was a cross sectional study conducted in Johannesburg Health District facilities.

3.2 STUDY SETTING

The study setting was Johannesburg Health District, an urban district, located in Gauteng Province of South Africa.

Gauteng Province has five health districts namely Johannesburg, Ekurhuleni, Tshwane, Sedibeng and West Rand. The sixth District Metsweding was recently merged with the Tshwane District. The Gauteng Department of Health provides health services to 8.3 million people (uninsured) through a network of hospitals; community health centres (CHCs), fixed primary health care (PHC) clinics and mobile clinics, as well as community outreach programmes.



Figure 3.1 Gauteng Province

Source: Annual Performance plan, 2010/2011-2012/13, Gauteng Department of Health

Johannesburg Health District

The Johannesburg Health District is one of the most populated districts in South Africa. Comparing the district with other four districts in the Gauteng Province, it has 114 (36%) clinics, 10 (29%) community health centres, one district hospital (9%), one specialised hospital, one psychiatric hospital, one (17%) regional hospital, one tertiary hospital (33%) and two (50%) central hospitals. All the health facilities provide services for patients suffering from NCD. According to Statistics South Africa's community survey, the population served by the public health facilities is estimated at 3,888,180 in 2007 (Statistics South Africa, 2007).

3.3 STUDY SCOPE

The study involved analysis of secondary data collected from selected CHCs using the NCD monitoring tool (Appendix B) introduced by the NDoH in 2011.

3.4 STUDY PERIOD

The study period was one week chosen randomly from 52 weeks (without any public holiday) in the year 2011.

3.5 STUDY POPULATION AND SAMPLING

The study population included NCD patients attending CHCs in JHB Health District. Five CHCs were randomly chosen from a total of seven sub-districts. There was no CHC in two sub-districts. One week (April 11-15) was chosen randomly from 52 weeks (without any public holiday) in the year 2011.

3.6 DATA MANAGEMENT

3.6.1 VARIABLES

The variables measured for the study are listed in Table 3.1.

Table 3.1 List of variables

Objectives	Variables
Socio-demographic profile	• Age • Gender (Male, female) • Ethnicity (Blacks, Whites, Coloureds, Asians)
Clinical profile	• Alcohol history • Smoking History • Blood pressure • Clinical examination • Blood glucose • Weight

3.6.2 DATA COLLECTION

The data was collected using the NCD tools designed by NDoH (Appendix B).

3.6.3 DATA ANALYSIS

Data was captured with MS Excel software and analysed with NCSS software (NCSS, 2007). Following descriptive statistics were reported upon.

- Continuous variables (such as age): Continuous variables with normal distributions: mean and standard deviation (SD). Other continuous variables: median and inter-quartile range.
- Categorical variables (such as ethnicity): proportion and range.

The following analytical statistical tests were used:

- Continuous variables: t-test and ANOVA
- Categorical variables: Chi-square test
- The association among the variables were measured with tests for correlation (Pearson or Spearman).

The statistical significance was calculated at the 95% confidence level.

3.7 ETHICAL CONSIDERATIONS

Permission for conducting research and accessing documents was provided by Head of Department for the Gauteng Department of Health and Social Development delegated representative (Appendix A). The study was also approved by University of the Witwatersrand Human Research Ethics Committee (Medical) (Appendix A). Confidentiality and anonymity was maintained all the time for collection, capturing, and reporting of the information. Patients' names and identifications were excluded while capturing data and separate study ID was generated for each patient.

CHAPTER 4

RESULTS

The results obtained from the analysis of data are described in this chapter.

4.1 STUDY PARTICIPANTS

Figure 4.1 shows that Zola CHC saw more selected NCD cases which is 35.9% of 968 of study participants among the five CHCs.

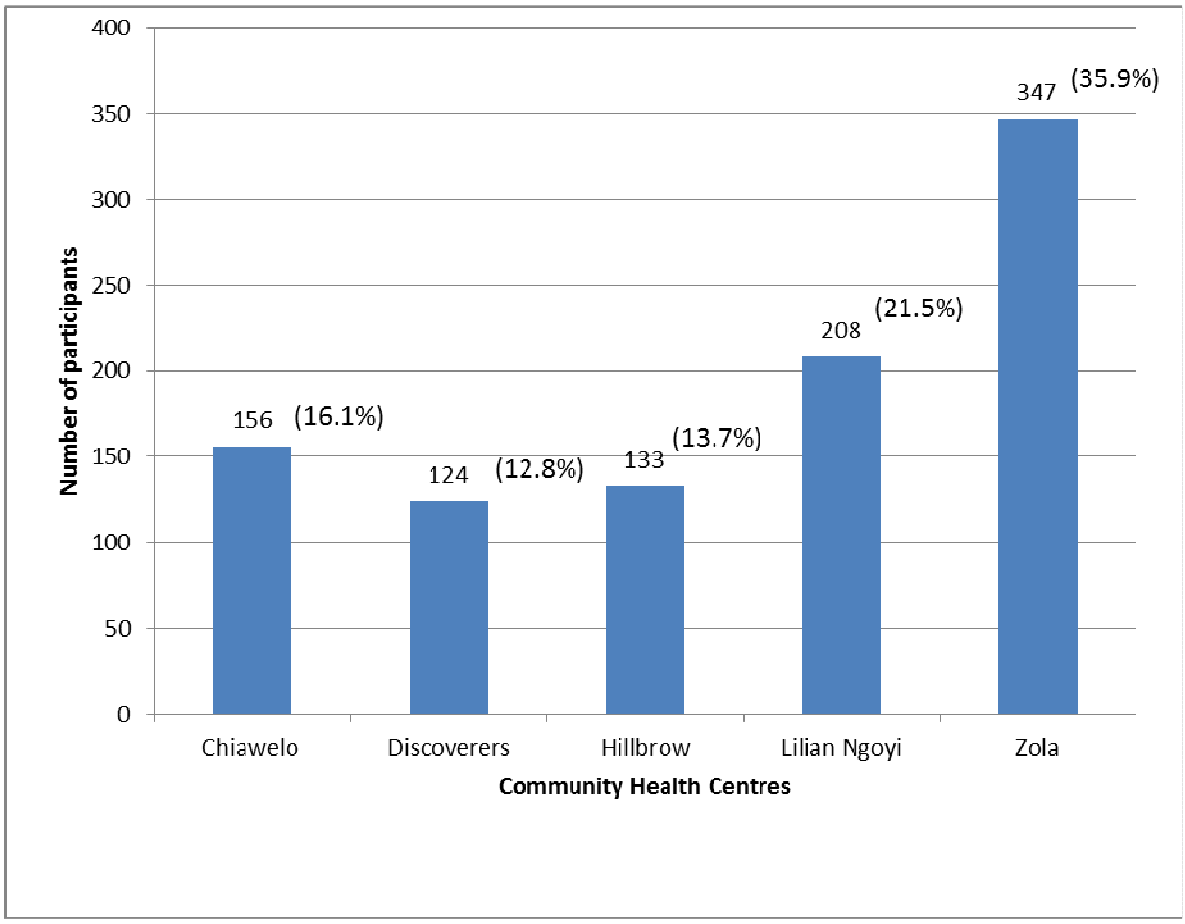


Figure 4.1 Study participants (n = 968)

The number of study participants was profiled according to the selected types of NCD as listed in Table 4.1. The proportion of study participants with diabetes mellitus was 39.4%; those with hypertension at 94.6% and the ones with hyper-cholesterolaemia were 4.6% of the total 969 participants.

Table 4.1 Number of study participants per disease

Sites	N	Diabetes	Hypertension	Hyper-cholesterolaemia
Chiawelo	156	77 (20.1%)	145 (15.8%)	24 (53.3%)
Discoverers	124	40 (10.4%)	120 (13.1%)	11 (24.4%)
Hillbrow	133	15 (3.9%)	132 (14.4%)	5 (11.1%)
LilianNgoyi	208	88 (23.0%)	198 (21.6%)	1 (2.0%)
Zola	347	162 (42.4%)	321 (35.0%)	4 (8.8%)
Total	**968**	**382**	**916**	**45**

However, a number of study participants had co-morbidities, which is listed in Table 4.2. Thirty-one study participants had all three diseases.

Table 4.2 co-morbidity of diseases

sites	N	Diabetes	Hypertension	Hyper-cholesterolaemia
Diabetes	382		271 (35.2%)	31 (68.8%)
Hypertension	916	271 (83.3%)		38 (84.4%)
Hyper-cholesterolaemia	45	31 (9.5%))	38 (4.9%)	
Total	968	325	768	45

4.2 SOCIO-DEMOGRAPHIC PROFILE

The socio-demographic profile of the study participants is described below. As a number of study participants had two or more diseases, the total number would not add up to 968. The profiles of the study participants were described for the entire cohort followed by categorisation according to three disease cohorts (diabetes, hypertension and hypercholesterolemia). For example, diabetic group would include diabetic study participants with or without hypertension and hypercholesterolemia or both.

4.2.1 AGE DISTRIBUTION

The mean age of the study participants was 59 years (standard deviation 12 years) with the age of youngest and oldest study participants were 19 and 96 years respectively (Table 4.3 and Figure 4.2).

Table 4.3 Age distribution of three disease cohorts

Age (years)	**n**	**Mean ± SD** (in years)
Diabetes	382	60 ± 11
Hypertension	916	59 ± 12
Hyper-cholesterolaemia	45	60± 10
Total	**968**	**59 ± 12**

SD: standard deviation

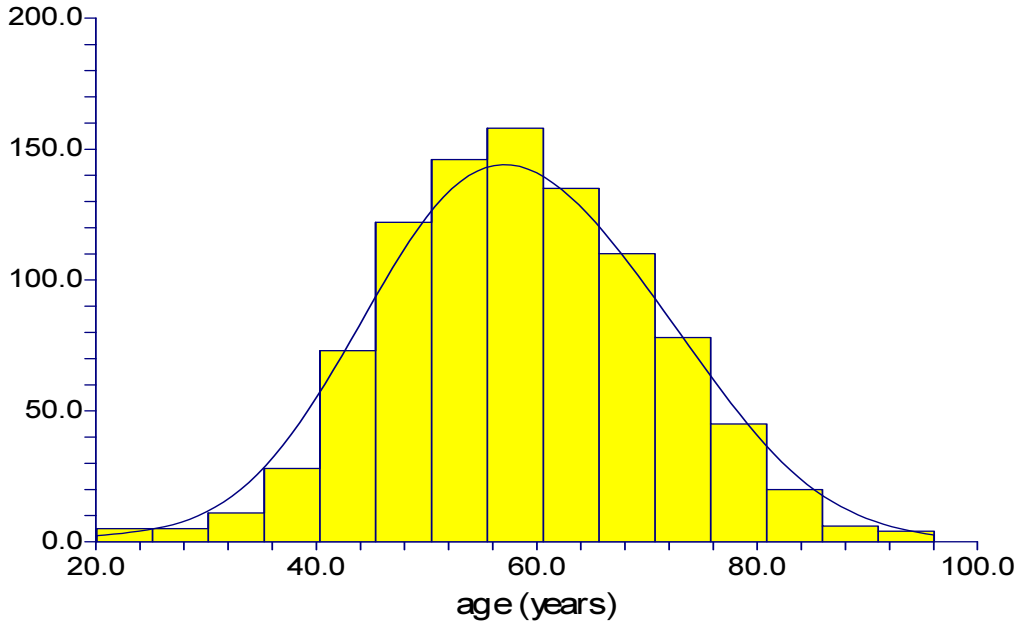


Figure 4.2 Age distribution of study participants

Age is categorised into four categories: less than 44 years, 44-54 years, 55-63 years and more than 64 years (Table 4.4). The majority of the study participants were 45 years and above.

Table 4.4 Age distribution

Age categories	**N (%)**
Less than 45 years	120 (12.4%)
45-54 years	268 (27.7%)
55 – 64 years	298 (30.8%)
More than 65 years	282 (29.2%)
Total	**968 (100%)**

4.2.2 GENDER DISTRIBUTION

The distribution of gender of the study participants is listed in Table 4.5. The prevalence of both hypertension and diabetes mellitus was more common in females than males.

Table 4.5 Gender

	Total	Female	Male
Diabetes	382	254 (67%)	128 (33%)
Hypertension	914	633(69%)	281 (31%)
Hyper-cholesterolemia	45	24(53%)	21 (47%)

There was a significant difference between male and female (chi- square test) in terms of prevalence of diabetes ($p<0.001$) and hyper-cholesterolemia ($p=0.03$).

4.2.3 ETHNICITY

There were more study participants from Black community than from other race groups in the study cohort (Table 4.6). There were no white or Asian population in the hyper-cholesterolaemia Group. Fisher's Exact test showed no significant differences between the two ethnic groups in terms of prevalence of diabetes and hypertension ($p = 0.15$).

Table 4.6 Ethnicity

Ethnicity	N	Diabetes	Hypertension	Hyper-cholesterolaemia
Blacks	890	378	839	41
Whites	3	0	3	0
Asians	2	1	2	0
Coloureds	3	1	3	1
Total	898*	378	897	42

*missing values

4.3 CLINICAL PROFILE

4.3.1 RISK FACTORS

4.3.1.1 SMOKING

Interestingly, there were more cases of hypertension, diabetes mellitus and cholesterol among non-smokers (Table 4.7). However, chi-square test showed no significant differences between the two groups in terms of prevalence of diabetes, hypertension and hyper-cholesterolaemia (p = 0.90).

Table 4.7 Smoking

	Total	Smoker	Non-smoker
Diabetes	382(100%)	28 (7%)	354 (93%)
Hypertension	916(100%)	61 (7%)	855 (93%)
Hyper-cholesterolaemia	45 (100%)	4 (9%)	41 (91%)

4.3.1.2 ALCOHOL

Non-alcohol drinkers were more in numbers across the three selected NCD than alcohol drinkers (Table 4.8). However, chi-square test showed no significant differences between the two groups in terms of prevalence of diabetes, hypertension and hyper-cholesterolaemia (p = 0.50).

Table 4.8 Alcohol

	Total	Alcohol Drinker	Non-alcohol drinker
Diabetes	382 (100%)	3 (9%)	346 (91%)
Hypertension	916 (100%)	103 (11%)	813 (89%)
Hypercholesterolemia	45 (100%)	11 (24%)	34 (76%)

4.3.2 COMPLICATIONS

The complications of NCD are described in Table 4.9. Nephropathy was the most common complications followed by cardiac diseases.

Table 4.9 Complications

CONDITIONS	Percentage
Renal diseases	
Chronic Renal Failure	15 (1.5%)
Albuminuria	51 (5.2%)
Elevated Creatinine level	11 (1.1%)
Cardiac diseases	
Coronary Heart Disease	11 (1.1%)
Heart Failure	13 (1.3%)
Peripheral Arterial Disease	5 (0.5%)
CVA / TIA	14 (1.4%)
Left Ventricular Hypertrophy	36 (3.7%)
Advance Retinopathy	7 (0.7%)

4.3.3 SCREENING

There were three types of screening done as per Table 4.10 to identify co-morbid conditions: (a) female: cervical screening and breast examination and (b) male: Prostate specific antigen.

Table 4.10 Screening

SCREENING	N
Cervical Screening	189 /657 (28.7%)
Breast Exam	227 /657 (34.5%)
Prostate specific antigen	106/309 (34.3%)

4.3.4 ANNUAL EXAMINATIONS

A number of annual examinations were done for the 968 study participants (Table 4.11).

Table 4.11 Annual examinations

ANNUAL EXAMINATION	Number and (%)
Total Cholesterol	164 (16.9%)
High Density Lipoprotein (HDL)	75 (7.7%)
Triglycerides	134 (13.8%)
Low Density Lipoprotein (LDL)	96 (9.9%)
HBA_1C	100 (10.3%)
Creatinine	100 (10.3%)
Electro Cardio Gram (ECG)	45 (4.6%)
Fundoscopy	129 (13.3%)
Urine Protein	135 (13.9%)
Urine Test	384 (39.6%)
Foot Exam	605 (62.5%)
Oedema	152 (15.7%)
Peak Flow	39 (4.0%)

4.3.5 CLINICAL EXAMINATIONS

The clinical examination of the study participants included measuring blood pressure, weight and blood glucose (Table 4.12).

Table 4.12 Clinical examinations

Clinical examinations	Minimum	Maximum	Mean	Standard deviation
BP Systolic (mmHg)	100	203	140	18
BP Diastolic (mmHg)	10	160	85	10
Weight (kg)	31	164	82	19
Blood Glucose (mmol/l)	4	33	8	3

Twenty-two percent of 968 study participants had blood pressure of more than 140/90mmHg. Twenty percent of study participants had a weight more than 90kg. The blood sugar level of 22% study participants was more than 7 mmol/l.

4.3.6 HEALTH EDUCATION

The following health educations were given to the 968 study participants (Table 4.13)

Table 4.13 Health education

Health education	Number and (%)
Smoking	673 (69.5%)
Diet	869 (89.7%)
Exercise	873 (90.1%)
Alcohol	646 (66.7%)
Medications/Adherence	707 (73.0%)

CHAPTER 5

DISCUSSIONS

In this chapter, the results obtained from the analysis of the data were discussed and compared with those from other published studies.

5.1 INTRODUCTION

A cross sectional study was conducted in an urban health district with a purpose of assessing the socio-demographic and clinical profiles of study participants with selected NCD. The focus of the study was on (a) distribution of NCD (i.e. main burden); (b) risk factors (i.e. age, gender, ethnicity, smoking, alcohol, complication and co-morbidity); (c) management of NCD; and implications for hospital management. This study was conducted in Gauteng health facilities during one week of April 2011 (11- 15) April).

5.2 DISTRIBUTION OF NCD OF THE STUDY PARTICIPANTS

The study observed that the selected NCD (i.e. hypertension; diabetes mellitus and hyper-cholesterolaemia) were prevalent in all the study sites. Hypertension was the main burden among the three selected NCD. This picture could mean that the probable factors of the NCD such as (a) underlying socio-economic, cultural, political and environmental determinants; (b) common modifiable risk factors; (c) intermediate risk factors and (d) main chronic diseases were perhaps neglected by the District. The study by Smith (2007) confirms this situation that the district was reported to be experiencing challenges of service delivery in the areas of chronic diseases specifically diabetes and hypertension which was echoed by Mayosi, et al (2009). This scenario from the study highlights the need to pay attention to NCD as a global diseases threat and allocate more resources for management of these conditions in PHC facilities.

The analysis from the findings revealed that more cases were seen in the Zola CHC than other CHCs. The reasons could be perhaps due to higher population density. According to Johannesburg Health Report for financial year 2011/12, there were a higher number of follow-up cases on diabetes and hypertension found in the Sub-district D. This is where Zola CHC is situated. Due to vastness of Sub-district D, this scenario justifies the opening of the new district hospital in Sub-district D (Zola-Jabulani Hospital) to manage the existing complications of chronic diseases which might be beyond Zola CHC.

5.3 RISK FACTORS OF STUDY PARTICIPANTS WITH SELECTED NCD

5.3.1 AGE DISTRIBUTION

The findings of this study indicated that study participants over the age of 45 years (87%) were more than those that are less than 45 years of age. This means that the District Management should make a concerted effort to target this age group as they would be more vulnerable to unwanted deaths if these selected NCD are not prioritised and controlled. The NCD Alliance (2011) highlighted the importance of health system strengthening with focus on integration of NCD management at PHC level. However, the findings in this study are inconsistent with the study by Alwan, et al (2010) which stated NCD develop at younger ages, and result in premature death. The problem that arises from this inconsistency might be due to younger patients not attending the health facilities and remained undiagnosed. The Johannesburg Health District Management Team should recognise the emerging threat of NCD amongst the younger population and institute targeted screening programme and possible interventions for them.

5.3.2 GENDER

This study found a higher prevalence of selected NCD among male study participants. This could be due to high health seeking behaviours among females than males (Chinnakali, Mohan, Upadhyay, et al, 2012). The management of JHB Health District would probably need to spend more efforts to attract males through concerted attempts of promoting and marketing 'male friendly' health facilities. Added to the intervention; females need to be motivated to sustain coming to PHC facilities for regular assessment for NCD through health education and promotion.

5.3.3 ETHNICITY

The majority of study participants were Blacks. The catchment population of the selected CHCs were located in Black Township. However, there was one facility located in the suburbs which was part of the study. This outlook of ethnic difference in response to the results indicates that Whites, Coloureds and Asians are probably using other alternatives to manage their NCD or they go directly to other levels of health care.

5.3.4 SMOKING AND ALCOHOL

Smoking and alcohol are modifiable risk factors that contribute to the commencement of NCD. This study found non-smokers and non-alcohol drinkers were also affected by the selected NCD, which might be due to under-reporting or other confounding variables. Puoane, Tsokeli, Sanders, et al (2008) proposed that successful NCD control would require strong effective service approach, health promotion and prevention. For modifiable risk factors such smoking and alcohol drinking, the WHO (2010b) recommend the multi-pronged approaches to prevent and alter these as interventions. It is therefore necessary that Johannesburg Health District should adopt the WHO STEPwise Framework for NCD Risk Factor Surveillance in order to source funds for current and

future NCD needs.

5.3.5 CO-MORBIDITY

This study found high prevalence of co-morbid conditions. This indicates that district should offer integrated chronic care clinics and may have to plan extra resources especially if one patient needs to be treated for many health conditions. Abegunde, et al, (2007) highlighted that developing countries health system is functioning at maximum capacity and worsening epidemic of NCD is set to further impose strain on an already overwhelmed system, which might be the situation in the Johannesburg District.

The most prevalent complications among the study cohort were nephropathy and cardiac diseases. This might be due to poor management of these patients and lack of integration of NCD in the PHC system. It might be also due to failure of the health professionals to check co-morbidities problems. Clinical examination by health professionals is an essential component for management and prevention of complications (Steyn, Levitt, Patel, et al, 2008). Moodley and Rambiritch (2007) suggested better management of NCD would require continuous professional development and an up to date knowledge of health professionals about the management of NCD.

5.4 MANAGEMENT OF NCD

5.4.1 CLINICAL EXAMINATIONS

Almost 20% of the study participants had poorly controlled hypertension (blood pressure of more than 140/90 mm Hg), obesity (weight more than 90kg) and diabetes (Blood sugar level more than 7mmol/l). This is of concern and the District management should organise a workshop with all the doctors to improve their clinical management

practices.

5.4.2 SCREENING

Screening detects asymptomatic cases. For this study, screening focused on cancer problems such as female cervical cancer screening, breast cancer screening and prostate specific antigen cancer screening. Few screening tests were reported in this study. This was probably due to lack of agreed tools for screening and interest in early detection of co-morbid conditions. For an example if facilities to conduct mammograms are not available in PHC facilities, it would not be done.

5.4.3 ANNUAL EXAMINATIONS

This study found a low uptake of annual examination for NCD study participants. The WHO STEPwise Framework for NCD Risk Factor Surveillance assists to identify current and future public health needs within the sphere of chronic care. The pinnacle of this framework enhances the essential surveillance of physical and bio-chemical measurements in the management of risk factors (Bonita, De Court, Dwyer, 2001). Regular annual examination is a key to that process. However, the findings of study indicated that annual examinations were less prioritised. This means that the district is putting minimal efforts to provide examinations of potential risk factors for NCD.

5.4.4 HEALTH EDUCATION

Health education was given priority in the JHB Health District as more study participants received some form of education on NCD management. This study's finding contradicts the findings from other studies which reported failure of health facilities to provide with appropriate health education at the health facilities (Moodley and Rambiritch, 2007; Mayosi, Flisher, Lallo, et al, 2009). The District is probably doing a good job in providing

health education on NCD and this practice need to preserved and effected with every patient encounter.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

In this chapter, the recommendations obtained from this study were assessed in relation to the aims and objectives of the study so that appropriate conclusions can be drawn. The limitations of the study are listed. Based on the findings of the study, appropriate recommendations and suggestions for future research are included.

6.1 CONCLUSIONS RELATED TO THE AIMS OF THE STUDY

This was a cross-sectional study assessment of selected NCD at five community health centres in JHB Health District during one week study period in 2011. Nine-hundred and sixty eight study participants were recruited for the study during this period.

6.1.1 DESCRIPTION OF THE CLINICAL PROFILES OF PATIENTS

Among the study participants, the prevalence of hypertension (94.6%) was highest followed by diabetes (39.4%) and hyper-cholesterolaemia (4.6%). A number of subjects had comorbidity associated with all three conditions. The complications among the study participants include nephropathy, cardiac diseases and retinopathy. Annual screening was done for a number of study participants but it was erratically done so that all study participants were not screened. More than fifth of the patients had poor controlled hypertension (blood pressure of more than 140/90 mm Hg), diabetes (Blood sugar level more than 7mmol/l) and obesity (weight more than 90kg).

6.1.2 DESCRIPTION OF THE SOCIO-DEMOGRAPHIC AND CLINICAL PROFILES OF

STUDY PARTICIPANTS ATTENDING THESE CHCs

The majority of the study participants were 45 years and above (88%), female (53%), and black (98%); There were no significant association between these three conditions and risk factors such as smoking and alcohol drinking.

6.2 LIMITATIONS OF THE STUDY

The following limitations were encountered during the study period

(a) Incomplete data- which was addressed by checking patients' clinical records.

(b) Completing the Integrated Chronic Disease patient form by nursing staff was a major challenge due to time constraints.

6.3 RECOMMENDATIONS

6.3.1 FOLLOW-UP

This study found NCD passport as a useful monitoring tool and should be introduced to all the health facilities in a phased manner.

This study highlighted the poor patient management associated with failure to screen, ability to handle co-morbidities and to minimize complications of NCD. The District Management should address this issue by organising workshops with the clinical staff in these facilities and share the findings of this study.

6.3.2 FUTURE RESEARCH

The future research recommendation for District Management Team is:

(a) To conduct similar studies in all health facilities for a longer duration.

(b) To investigate the referral system within NCD to manage comorbidity and complications associated with NCD.

(c) To investigate cost of managing NCD

6.4 CONCLUSION

This study focussed on socio-demographic and clinical profiles of Johannesburg Health District's selected NCD in five CHCs. Similar study was never conducted in JHB and thus its uniqueness to advance the knowledge of NCD in Gauteng Province, Johannesburg Health Management and the rest of the world. The areas needing attention include the reasons for the rising NCD especially diabetes mellitus and hypertension and the low tracking of cholesterol problems.

REFERENCES

Alberti H, Boudriga N, Nabli M. 2007. DammSokkor: Factors associated with the quality of care of patients with Diabetes. A study in primary care in Tunisia, Diabetes Care.30 (8):2013-2018

Alwan A. 2008. WHO action plan for the global strategy for the prevention and control of noncommunicable diseases. Geneva: World Health Organization.

Alwan A, Maclean DR, Riley LM, d'Espaignet ET, Mathers CD, Stevens GA, Bettcher D. 2010. Monitoring and surveillance of chronic non-communicable diseases: progress and capacity in high-burden countries. The Lancet 376(9755):1861-1868.

Abegunde DO, Mathers CD, Adam T, Ortegon M, Strong K. 2007. The burden and costs of chronic diseases in low-income and middle-income countries. The Lancet 370(9603):1929-1938.

BaradaranH, and Knill-Jones R. 2004. Assessing the knowledge, attitudes and understanding of type 2 diabetes amongst ethnic groups in Glasgow,Scotland. PractDiabInt 21 (4): 143-148.

Bonita R, De Court, Dwyer T, Jamrozik K, Winkelmann R. 2001. Surveillance of risk factors for noncommunicable diseases: the WHO STEPwise approach: summary. Geneva: WHO.

Brown JB, Harris SB, Webster-Bogaert S, Wetmore S, Faulds C , Stwerat M. 2002. The role of patient, physician and systemic factors in the management of type 2 diabetes mellitus. Family practice 19: 344-349.

Chinnakali P1, Mohan B, Upadhyay RP, Singh AK, Srivastava R, Yadav K. 2012. Hypertension in the elderly: prevalence and health seeking behavior. N Am J Med Sci, 4(11):558-62.

Gauteng Department of Health. 2008. Health in Gauteng: Status report. Johannesburg: Gauteng Department of Heath.

Gauteng Department of Health and Social Development. 2009. Gauteng Department of Health and Social Development Strategic Plan 2009-2014.

Jamison DT, Joel G. Breman JG, MeashamAr, et al. Editors. 2006. Disease control priorities in developing countries. Washington DC: World Bank.

Johannesburg Heath District.2012. Johannesburg District Health Report 2011/2012. Johannesburg: DoH.

Mayosi BM, Flisher AJ, Lalloo UG, Sitas F, Tollman SM, Bradshaw D. 2009. The burden of non-communicable diseases in South Africa. The Lancet; 374(9693):934-947.

Moodley LM and Rambiritch V. 2007. An assessment of the level of knowledge about diabetes mellitus among diabetic patients in a primary healthcare setting., SA FamPract, 49(10), 16a-16d.

National Department of Health. 2006. Non-Communicable Diseases Strategic Vision. Johannesburg: Government Publishers.

National Department of Health.2010a. National Department of Health Medium Term Strategic Plan 2010/11-2012/13. Pretoria: Government Publishers.

National Department of Health 2010b.Negotiated Service Delivery Agreement. Pretoria: Government Publishers.

National Department of Health. 2011. Health Minister calls for more emphasis on prevention of diseases. http://www.doh.gov.za/docs/pr/2011/pr0429.html [accessed 01/05/2011]

NCD Alliance. 2011. NCD Alliance Plan. <http://ncdalliance.org/> [accessed 20/04/2011]

NCSS. 2007. NCSS Statistical software. <http://www.ncss.com> [accessed 31/10/2013]

Puoane T, Tsokeli L, Sanders D, Parker W. 2008. Chronic Non-Communicable Diseases, in South African Health Review, Chapter 5, pp. 73-87. Durban: Health Systems Trust.

Simmons D Lillian S, Swan J, Haar J. 2007. Discordance in perceptions of barriers to diabetes care between patients and primary care and secondary care, Diabetes care 30: 490-495.

Smith C. 2007. Service provision for diabetes and hypertension at the primary level in the Johannesburg metropolitan area. [Research report] Johannesburg: University of the Witwatersrand.

Statistics South Africa. 2007. South African Statistics. http://beta2.statssa.gov.za/ [accessed 31/10/2013]

Steyn K, Levitt NS, Patel M, Fourie J, Gwebushe N, Lombard C, Everett K. 2008. Hypertension and diabetes: Poor care for patients at community health centres,JEMDSA 13(2) : 64-70.

Sutton M , McLean G. 2006. Determinants of primary medical care quality measured under the new UK contract: cross sectional study.BMJ 332:389-390.

UNO. 2010. Proceedings of the General Assembly Sixty-fourth session. 86th plenary meeting. 13 May 2010. New York. New York: UNO.

World Health Organization.2010a. Chronic Diseases and their common risk factors - Facing the facts #1. Geneva: World Health Organization.

World Health Organization. 2010b. Chronic Diseases in low- and middle-income countries - Facing the facts #3. Geneva: World Health Organization.

APPENDICES

APPENDIX A: ETHICS CLEARANCE CERTIFICATE AND LETTERS OF APPROVAL

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Modise Elias Makhudu

CLEARANCE CERTIFICATE	M110811
PROJECT	Assessment of Selected Non-Commuicable Dieases in an Urban Health District of South Africa
INVESTIGATORS	Modise Elias Makhudu.
DEPARTMENT	School of Public Health
DATE CONSIDERED	26/08/2011
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Dr D Basu

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...

health and social development
Department: Health and Social Development
GAUTENG PROVINCE

HEALTH AND SOCIAL DEVELOPMENT
JOHANNESBURG METRO

Enquiries:Benny Sikhakhane
Hillbrow CHC
Private Baxg X21, JHB, 2001
Tel:011 694 3715
Fax: 011 694 3826
E-mail :Bernard.Sikhakhane@gauteng.gov.za

To: Mr. M Makhudu

Date: 3 May 2011

RE: **REQUEST FOR PERMISSION TO CONDUCT RESEARCH AT JOHANNESBURG METRO DISTRICT RESEARCH TITLE: ASSESSMENT OF SELECTED NON-COMMUNICABLE DISEASES (NCDs) IN AN URBAN HEALTH DISTRICT IN SOUTH AFRICA**

Dear Mr. Makhudu

Permission is granted to the researcher to access data for the purpose of conducting the above mentioned study. This approval is limited to compliance with the terms and conditions stipulated in the Gauteng Department of Health (GDOH) Research Policy and that the Researcher will submit the Ethics Committee clearance certificate before undertaking the research.

The researcher is expected to provide progress reports and address any queries to the Deputy Director: Monitoring and Evaluation.

Mr. B Sikhakhane
Deputy Director: Monitoring and Evaluation, Johannesburg Metro

health and
social development
Department: Health and Social Development
GAUTENG PROVINCE

Enquiries: Ms. S. Twala
Tel: (011) 355 3477
19th April 2011

To: Chair of the Ethics Committee
University of Witwatersrand's Ethics Committee

Dear Sir/Madam

RE: REQUEST FOR PERMISION REQUEST TO CONDUCT A RESEARCH STUDY AT JOHANNESBURG METRO DISTRICT BY MR MODISE MAKHUDU

The department received a request from Mr. M. Makhudu for permission to conduct a research study in the Johannesburg Metro District. The study is entitled ***"Assessment of selected Non-Communicable Diseases (NCDs) in an urban health district in South Africa"***. The department has no objection to this study provided it has been granted Ethics Clearance by an NHREC accredited committee.

We therefore request that you review his proposal and provide ethical clearance, and then we will grant final permission.

Yours
Sincerely

Sue le Roux
DIRECTOR: POLICY, PLANIING AND RESEARCH
Date: 20/04/2011

APPENDIX B: DATA COLLECTION TOOL

NCD PASSPORT

PERSONAL DETAILS

NAME:

LABORATORY REFERENCE STICKER:

DATE OF BIRTH: GENDER: M / F

PATIENT NUMBER: HEIGHT [m]

CURRENT DISEASES

Year diagnosed	Disease			Year diagnosed	Disease
	Diabetes				COPD
	Hypertension				Asthma
	Epilepsy				HIV
	Rheumatic Heart Disease	Penicillin prophylaxis	No / Yes		Other

Integrated Chronic Disease Map

MAJOR RISK FACTORS

Age (yr)	< 44 [0]	45-54 [2]	55-63 [3]	>64 [4]	Hypertension	No [0]	Yes [1]		Alcohol	No / Yes
Diabetes	No [0]	Yes [1]			High Cholesteral	No	Yes		Waist Circumference [Male >102/ Female>88cm]	
Family: Ischeamic Heart	No [0]	2nd gen [3]	1st gen [5]		Smoker	No	Yes			

ASSOCIATED CLINICAL CONDITIONS

	Chronic Renal Disease		Coronary Heart Disease		Peripheral Arterial Disease
	Advanced Retinopathy		Heart Failure		CVA or Transient Ischeamic Attack

TARGET ORGAN DAMAGE

	Left Ventricular Hypertrophy [ECG]		Albuminuria [microscopy]		Elevated Creatinine [M=115-133, W=107-124]

SCREENING

	Cervical Screening		Breast Exam		PSA

ANNUAL EXAMINATION

	Cholesteral		Trigs		HBA_1C	<7.5	7.5-9.5	>9.5	Fundoscopy [eye]	
	HDL		LDL		Creatinine				Urine Protein (PCR)	

Date [dd/mm/yy]	BloodPressure	Weight [kg]	Waist [cm]		Body mass index			Blood Glucose		Urine Test	Foot Exam	Oedema	Seizures freq/pm	Epilepsy Bloods	Peak Flow	Smoking		Diet (Fruit & vegetables)	Exercise		Education given						*FINDRISC SCORE	Comments	Sign
			M<93 F<79 [0]	M:94-101 F:80-87 [3]	M>102 F>88 [4]	<25 [0]	25.1-29.9 [1]	>30 [3]	<7.0	>7.1							~~Y~~	Yes	daily [0]	not daily [1]	>30 min day [0]	no [2]	Smoking	Diet	Exercise	Alcohol	Inhaler	Meds/ Advance			

*FINDRISC SCORE: <7 -LOW RISK; 7-11 -SLIGHTLY ELEVATED RISK; 12-14 -MODERATE RISK; 16-20 -HIGH; >20 VERY -HIGH RISK