Determinants of selected chronic diseases among the elderly population of South Africa

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ABSTRACT

Background: The increasing life expectancy and decreasing fertility rates have resulted in ageing populations globally. South Africa as well as other Sub-Saharan African countries are undergoing an epidemiological transition, whereby they are experiencing increase in death caused by non-communicable diseases. Most NCDs are related to behavioural or lifestyle factors, which are significantly shaped by socio-economic factors. The main objective of the study was to examine the determinants of selected chronic diseases among elderly persons in South Africa.

Methods: The study used data from the 2019 General Household Survey (GHS). Data analysis was done in three stages univariate, bivariate, and multivariate. At the bivariate analysis level, a chi-square test was utilized to explore the association between selected chronic diseases for each of the selected background characteristics. At the multivariate level, the study used logistic regression to analyse the association between having the selected chronic diseases and the selected background characteristics.

Results: Elderly females had the highest prevalence of selected chronic conditions of 55.7% compared to the male elderly persons who had a prevalence of 41.8%. Elderly persons whose highest level of educational attainment was higher education had a lower prevalence of being diagnosed with the selected chronic conditions of 41.1%. Moreover, elderly persons with a disability status of “a lot of difficulty” had the highest prevalence of selected chronic conditions of 57%. Moreover, the study found that elderly persons who resided in Western Cape were more like to be diagnosed with selected chronic conditions compared to elderly persons who resided in Limpopo due to poor disease control in the Western Cape.

Conclusions: The study found that there has been an increase in the number of elderly persons. However, the increase was accompanied by an increase in the prevalence of selected chronic diseases. Furthermore, the study found that age, sex, marital status, educational level, disability status, household composition and province of residence were statistically associated with being diagnosed with the selected chronic conditions among elderly persons in South Africa. Additionally, females and elderly people of higher ages who obtained lower levels of education and were not married had a higher prevalence and were more likely to be diagnosed with the selected chronic conditions. Therefore, the study findings show that there is a need for successful ageing and to develop prevention strategies in the management of the selected chronic conditions.

Keywords: elderly; selected chronic conditions; prevalence; disability

DECLARATION

I, Maatla Dave Temane (26595583), declare that this work titled "*Determinants of selected chronic diseases among the elderly population of South Africa*" is my original research work, and has never been submitted for any degree or examination in any other University or Institution. I declare that the information contained in this document is a true copy of my thesis and has been approved for submission by my thesis supervisor. This work was supervised by Dr Mluleki Tsawe from the Department of Population Studies and Demography. This work is submitted in partial fulfilment of the requirements for the degree Master of Social Science in Population and Sustainable Development at the North-West University, Mafikeng Campus, South Africa.

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CONTENTS

ABSTRACT ii
DECLARATION iii
ACKNOWLEDGEMENTS iv
LIST OF FIGURES vi
LIST OF TABLES vi
LIST OF APPENDICES vi
ABBREVIATIONS vii
CHAPTER 1: INTRODUCTION 1
1.1 Background 1
1.2 Problem statement 4
1.3 Objectives 6
1.4 Research questions 6
1.5 Rationale 6
1.6 Definition of concepts 7
CHAPTER 2: LITERATURE REVIEW 8
2.1 Introduction 8
2.2 Overview of selected chronic diseases 8
2.2. Levels and trends of selected chronic diseases in South Africa 10
2.3. Risk factors of selected chronic diseases 10
2.5 Determinants of chronic diseases 12
2.6 Theoretical framework 16
2.6.1 Social Determinants of Health (SDH) 16
2.7 Conceptual framework 17
CHAPTER 3: METHODOLOGY 19
3.1 Study setting 19
3.2 Data source 20
3.3 Study Variables 20
3.4 Sample 22
3.5 Method of analysis 22
3.6 Limitations 23
3.7 Ethical considerations 23
CHAPTER 4: DATA ANALYSIS AND RESULTS 24
4.1 Introduction 24
4.2 Characteristics of the study population 24
4.3 Association between chronic conditions and background characteristics 28
4.4 Determinants of chronic condition diagnoses by background characteristics 31
CHAPTER 5: DISCUSSION AND CONCLUSION 35
5.1 Introduction 35
5.3 Conclusion 39
5.4 Recommendations 40
REFERENCES 41
APPENDICES 48

LIST OF FIGURES

Figure 2.1: Conceptual framework on the determinants of chronic condition diagnosis 18
Figure 3.1: Map of South Africa 19
Figure 4.1(a): Percentage distribution of elderly persons with selected diagnoses 27
Figure 4.1(b): Percentage distribution of elderly persons with selected diagnoses by type 27

LIST OF TABLES

Table 3.1(a): Dependent variable (definition and categorisation) 21
Table 3.1(b): Independent variables (definitions and categorisation) 21
Table 4.1: Characteristics of elderly persons in South Africa 24
Table 4.2: Prevalence of chronic conditions diagnosis by background characteristics 28
Table 4.3: Binary logistic regression on the determinants of being diagnosed with selected chronic conditions 31

LIST OF APPENDICES

Figure A1: Ethics approval letter 48

ABBREVIATIONS

DUs: Dwelling Units

GHS: General Household Survey

LMICs: low-and middle-income countries

NCD: Non-Communicable Diseases

OHS: October Household Survey

SDOH: Social Determinants of Health

SSA: Sub-Saharan Africa

UNDP: United Nations Development Plan

US CDC: United States Centers for Disease Control and Prevention

WHO: World Health Organisation

CHAPTER 1: INTRODUCTION

1.1 Background

The increasing life expectancy and decreasing fertility rates have resulted in ageing populations globally. The World Health Organization (WHO) defines an elderly population as all persons who are 60 years and above (WHO, 2011). Ageing is identified as a risk factor for the emergence of multiple chronic diseases. In spite of the projected impact of population ageing, which will increase the burden of diseases related to chronic and multiple chronic conditions, there has been limited research on this matter in South Africa, especially on elderly persons aged 60 years and older, and on the implications for health systems (Daviaud *et al.,* 2019: 174). There were around 900 million people aged 60 or older globally, which accounted for 12.5% of the global population. It is estimated that the number will have increased to 2.1 billion or 21.5% of the global population by 2050. The speed of population ageing, especially in low- and middle-income countries, has led many to say that the developing world is “growing old before it grows rich” (UNDESA., 2015).

The study of demographics is giving us a reality that we are living in an increasingly aging population. It was estimated that the mid-year population of South Africa in 2020 was 59,62 million people. In terms of population age-sex structure, about 51,1% (approximately 30,5 million) of the population was female, while 5,43 million people were aged 60 and older (Statistics South Africa., 2020). Moreover, it was estimated that the proportion of elderly persons aged 60 and older have increased from 7,6% in 2002 to 9,1% in 2020. The elderly population group are vulnerable and face limitations such as having easy access to health care, cash transfers as well as food programmes and social assistance programmes (Statistics South Africa., 2020). A report by the United Nations states that the proportion of elderly people was 9% in developing countries and 22% in developed countries (UNDP, 2015). The elderly population of Nigeria aged 60 and older was estimated to be 9.4 million people in 2020. The numbers of the elderly population increased by 740 000 people between 2018 to 2022 (Statista Research Department., 2022). As compared to South Africa, the elderly population aged 60 and older was estimated to be 5,43 million, which saw an increase of 2.1% between 2002 and 2020 (Statistics South Africa., 2020). Developing countries that experience population ageing are low-income level countries that lack a proper social security system. However, in developed countries, population ageing is experienced by high-income level countries with a good social security system. Moreover,

with the pace of population ageing in developing countries being greater than that of the developed countries, it will leave less room for developing countries to anticipate and confront the consequences of population ageing (Kastor & Mohanty, 2016:178).

The burden of non-communicable diseases (NCDs) was believed to be a problem affecting the developed countries, until recently. However, there has been increasing evidence that indicated that NCDs are in fact, starting to affect developing countries more than developed countries. South Africa as well as other Sub-Saharan African countries are undergoing epidemiological transition, whereby they are experiencing a decline in the prevalence of many infectious diseases and seeing an increase of deaths caused by non-communicable diseases (Maiyaki, & Garbati, 2014:1). Noncommunicable diseases accounted for seven of the ten leading causes of deaths in 2019 at a global level, the seven causes accounted for 44% of all deaths. Moreover, noncommunicable diseases all together resulted in 74% of deaths globally in the same year. (World Health Organization., 2020). The health of elderly persons is a universal population health concern. Non-communicable diseases and other health issues have reduced the quality of life for elderly persons. Deaths due to non-communicable diseases rise dramatically at older ages for both males and females due to the increasing incidence of neoplasms, cardiovascular diseases and ischaemic heart diseases. In the case of elderly persons (aged 60 - 64) for males, 72.1% of deaths were due to NCDs and just above 79% for female elderly persons (Statistics South Africa., 2021:34 - 36).

According to World Health Organization (2018), noncommunicable diseases (NCDs), such as chronic respiratory disease, heart diseases, cancer and diabetes, were the main source of death globally and represent a rising global health hazard. NCDs were accountable for approximately 41 million deaths each year, equating to over 7 out of 10 deaths worldwide. The change in socioeconomic factors have resulted in NCDs causing deaths of 15 million people before the reach 70 years each year. Moreover, NCDs were estimated to account for 51% of all deaths in South Africa, cardiovascular diseases were the leading cause of death, which accounted for 17% of deaths (World Health Organization, 2018). Functional limitations among older people are the consequence of medical issues as well as the interactions between wellbeing conditions, participation and activity, individual variables, and ecological components (Ćwirlej-Sozańska, 2019:2). It is estimated that approximately

15% of the world's population lives with some form of disability (WHO, 2011). Disability statistics are vitally important in assessing the progress of disability programmes and monitoring their outcomes (Lozano *et al.,* 2012). Moreover,Non-communicable diseases (NCDs), such as heart disease, cancer, lung disease and diabetes, are not at this point just an issue for developed countries, but also a problem for low- and middle-income nations. In 2014, tuberculosis and diabetes were the two leading causes of natural death and among the ten underlying natural causes of death, 60% were caused by non-communicable diseases (Statistics South Africa, 2017:5)

According to Statistics South Africa (2014), health problems associated with low-income countries in the developing world have led to the elderly population being more vulnerable to diseases and functional limitations. South Africa has seen an increase in the numbers and proportions of elderly persons aged 60 and above, from 2.8 million in 1996 to 4.1 million in 2011, and projections show that the numbers will increase to 7 million in 2030 (Statistics South Africa, 2014). Moreover, old age is frequently portrayed as being deprived of health because of fragility, morbidities, and functional limitations. This culminates in not being able to conduct certain activities, for example, taking care of oneself, hearing, walking, and recalling certain activities which one has performed, concentrating, and vision (Statistics South Africa, 2014). Furthermore, there are sex differentials in functioning among elderly persons. The biggest contrast in the proportion of ageing men and women's functioning were those of seeing (1.9%) and walking (1.8%) and remembering (2.0%) (Statistics South Africa, 2014). Elderly people depend on chronic medication and assistive devices because of old age. The outcomes show that a significant portion of elderly people were utilizing chronic medication (38%) by age 60–64. Comparison by population groups shows that the white elderly population group utilizes more assistive devices, for example, hearing aid (10.0%), glasses (79.9%), wheelchair (4.9%), and chronic medication (58.0%) when contrasted with other population groups (Statistics South Africa, 2014).

The globalization of cigarette consumption and promotion has increased the burden of tobacco related diseases, and the changes in food consumption have also contributed to nutrition transition. Rapid unplanned urbanisation also tends to promote the development of lifestyle diseases due to unhealthy environments that encourage the consumption of fast food, alcohol and tobacco use (Isiaho., 2016:11). Moreover, occupational risk factors are

vital predictors of NCDs. One's place of work or occupation can cause or aggravate NCDs, such as longer working shifts, work stress and sedentary work (Wandera *et al.,* 2015:2). Most NCDs are related to behavioural or 'lifestyle' factors, which are significantly shaped by socio-economic factors. However, certain population groups have a delicate genetic susceptibility, which increases the likelihood of developing NCDs. Some population groups in South Africa have displayed increased risk for certain NCDs. For example, the Indian population group are more susceptible to insulin resistance than other population groups in the country, which has resulted in an increased risk for type II diabetes. It was estimated that approximately 1 in every 72 Afrikaners has familial hypercholesterolaemia, which resulted in elevated low-density lipoprotein levels and an increased risk for ischaemic heart disease (Puoane *et al.,* 2012: 117).

1.2 Problem statement

Over the past three decades, noncommunicable diseases have been increasingly recognized as a major cause of disability and death. According to the 2010 Global Burden of Disease Study, NCD deaths increased from about 8 million in 1990 to 52.8 million in 2010 (Lozano *et al.*, 2012). According to the World Health Organisation (2020), ischaemic heart disease was the world leading cause of death, which accounted for 16% of the global deaths. Deaths caused by ischaemic heart disease have increased by more than 2 million to 8.9 million deaths in 2019 since 2000. Approximately 11% and 6% of total deaths are caused by stroke and chronic obstructive pulmonary disease, respectively (DRK-Schluechtern., 2022). Diabetes entered in the top 10 causes of death, following a significant percentage increase of 70% since 2000. Diabetes is also responsible for the largest rise in male deaths among the top 10, with an 80% increase since 2000. Studies have reported that age-standardized death rates caused by NCDs where higher in some sub-Saharan African countries such as South Africa, DRC, Ethiopia and Nigeria compared to some high-income countries (World Health Organization., 2020).

The study additionally reported that elderly women more at risk of NCDs than elderly men. The prevalence rate of NCDs in South Africa exceeds 65% for those aged 65 years and older. The risk factors are more rapid with the increase of urbanisation, change in lifestyle, especially in developing countries. The elderly population in urban areas have reported lower health status than those in rural areas. Moreover, studies have shown that non-

communicable diseases (NCDs) especially diabetes and hypertension are prevalent among elderly women living in South African urban areas, placing a heavy burden on the healthcare system. (Aboyade *et al.,* 2016: 3). According to 2018 mortality and causes of death report, the highest number of deaths that occurred in 2018 were among those aged 65–69 years 8,4% (Statistics South Africa., 2021). Diabetes mellitus was the leading cause of death for the elderly population aged 65 and older with 9,3%, followed by Cerebrovascular disease which resulted 8,7% deaths and hypertensive disease which was the third leading cause of death among the elderly populated which resulted in 8.4% of deaths (Statistics South Africa., 2021). The increase in the number of elderly persons and increase in the prevalence of chronic disease creates concern on successful ageing and quality of health care services for elderly persons (Kalula., 2011:24).

According to Statistics South Africa (2014), the national disability prevalence rate in 2011 was 7.5%. Elderly persons aged 85 years and older had the highest proportions of disability, of 53.2%, with the age group 60-64 having the least proportion, 18.7%. People with disabilities constituted the largest percentage of the population in Free State Province (11%) and the least was Gauteng province with 5.3%. Persons with severe difficulty in self-care who had some primary education was 21.6%, with higher education 5.8%, and no formal education, 24.2%. The survey looked at persons aged 20 years and older but did not provide age categories. The disability profile by Statistics South Africa emphasizes early childhood development and places less emphasis on the elderly population (Statistics South Africa, 2014). Although there are studies on health and disability in South Africa, these studies do not focus on the elderly population. Research on health in developing countries has been intensely centred on more youthful population groups. All things considered, the degree of ageing, the well-being needs of the elderly population, and also the consequences of national policies for the wellbeing and welfare of the elderly are inadequately comprehended. Research on the epidemiology of chronic diseases in elderly persons has not been extensive enough, particularly in South Africa. In South Africa, there is a lack of information on the health of elderly populations, especially from a population health point of view. There is a need for population research that measures the association between socio-demographic factors and the health of elderly persons in South Africa.

1.3 Objectives

Main Objective:

The main objective of the study is to examine the determinants of selected chronic diseases among elderly persons in South Africa.

Specific objective

The study aims to answer the following specific objectives:

- To examine the prevalence of selected chronic diseases among elderly persons in South Africa.
- To investigate the socio-demographic factors associated with the selected chronic diseases.

1.4 Research questions

The study aims to answer the following research questions:

- What is the prevalence of selected chronic diseases among elderly persons in South Africa?
- What are the socio-demographic factors associated with chronic diseases among elderly persons in South Africa?

1.5 Rationale

Research shows that there has been an increase in the number of older persons; however, with this increase in the ageing population, there is also a general increase in the number of elderly persons living with chronic diseases (Chirinda, 2014:5). Older persons might be living longer but they tend to have poor health conditions, such as living with chronic diseases, and this puts pressure on the already weak health care system, especially in the case of South Africa. Therefore, life expectancy must be accompanied by good health for elderly persons. Healthy ageing is key to building societies that are cohesive, peaceful, safe, just, and sustainable (WHO, 2011). The life expectancy is higher than at any other time; however, there is a decline in the quality of life of elderly persons due to the rapid increase in the number of elderly persons with chronic illnesses (Chirinda., 2014:7). Considerable attention is now being paid to non-communicable chronic diseases in South Africa, yet this increased

focus must be strengthened and supported throughout the next decade to battle the present pattern and accomplish a genuine decrease in the non-communicable chronic diseases and related health burden (Puoane *et al.,* 2013: 16).

Additionally, as indicated before, there is limited research on the epidemiology, as well as a population health focus, in terms of chronic diseases in elderly persons in developing countries, particularly South Africa. It is the wish of the author that the findings of this study be used by relevant policymakers (and stakeholders) as well as researchers to contribute to the knowledge production regarding issues surrounding population health among elderly persons. According to Fourie (2018), the National Development Plan (NDP) points out that it is of importance to create an inclusive system of social protection that addresses vulnerability and is responsive to the needs of those at risk, including the elderly and persons with disabilities. The third goal of the Sustainable Development Goals seeks to achieve good health and well-being. It is paramount to have an in-depth understanding on the causes of death in order to improve how elderly people live and achieve successful ageing.

1.6 Definition of concepts

Non-communicable diseases: Statistics South Africa (2021) defines NCDs as medical conditions or diseases that are non-infectious or non-transmissible among people. These last for longer periods of time and progress slowly and include, amongst others, cancer, asthma and heart diseases.

Comorbidities: the presence of two or more chronic conditions simultaneously (Almirall & Fortin., 2013: 4).

Chronic diseases: describes a health condition or disease that persists over time, or one that comes with age (Bernell & Howard., 2016:156).

Elderly person: The World Health Organization defines an elderly person, as a person who is 60 years and older (WHO: 2020).

Ageing population: According to Héran., (2013:15), an ageing population is one where the proportion of older people is increasing, it also known as 'demographic ageing' and 'population ageing'.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter constitutes the collection of scholarly work which is synthesised and evaluated in order to understand the determinants of selected chronic conditions among elderly persons in South Africa. The following subtopics will be discussed under the heading literature review: the overview of selected chronic diseases, levels and trends of selected chronic diseases in South Africa, risk factors of selected chronic diseases, determinants of chronic diseases focusing on socio-demographic factors such as age, sex, population group, marital status, geographical location and disability status, and the theoretical and conceptual framework.

2.2 Overview of selected chronic diseases

According to Villar (2012: 1089), with age, people become more susceptible to ill health from acute and chronic illnesses and have functional limitations. In the US, the concept of ‘successful ageing’ the concept originated in response to traditional stereotypes of ageing as an inevitable process of sickness and decline (Hanlon & Poulin, 2020: 42). The accelerated increase in the proportion of elderly persons is a significant concern today. The United Nations estimated that the population of elderly persons will constitute 21.5% of the global population by 2050, as compared to 9.9% in 2000, and it is expected that the population of elderly persons will grow at a faster rate compared to other age groups (United Nations, 2015). The increasing ageing population and rise in the number of people with NCDs has been a call for concern and accelerated the need to promote healthy or successful ageing, which entails the ability to maintain the functional ability that aids the well-being of elderly persons. Multimorbidity and increased risk of frailty mean that elderly persons with NCDs have complicated care needs. (Monaco., 2020:1353). Successful ageing is viewed as the absence of disease or disability (i.e. functional limitations), a healthy lifestyle involves maintaining cognitive and physical function, as well as engaging in social and productive activities). A healthy lifestyle and good habits are the key factors in successful ageing. Therefore, it is a priority to witness the population of South Africa ageing successfully with the absence of lifestyle diseases.

Additionally, lately there is an acknowledgment of the rising danger of chronic non-communicable diseases (NCDs) as significant contributors to preventable disease and untimely mortality, which has put these conditions solidly on the global development agenda (Puoane *et al.,* 2013:15). Chronic NCDs, which represent around 66% of all diseases universally, are the main cause of mortality worldwide. Cardiovascular disease, diabetes, cancer, and chronic obstructive pulmonary disease make up most of the NCD-related burden. This burden is expanding in numerous countries which, despite everything, still endure widespread infectious diseases, bringing about a twofold burden of disease (UN, 2011). For instance, around 83% of the worldwide mortality from NCDs happens in low-and middle-income countries (LMICs). It is estimated that the total deaths globally attributed to NCDs will experience an increase of 15% in the following decade (WHO, 2011).

The increasing incidents of cardiovascular risk factors such as reduced physical, unhealthy diets, obesity, diabetes, and hypertension has led to the rise of NCDs in sub-Saharan Africa. The quest to tackle NCDs should take a different strategy that goes beyond health, but should including education and mass communication to promote healthy lifestyles, physical activities such as exercising and reduction of risk factors such as the use of alcohol and tobacco (Bigna., 2019:1296). In the current South African setting, social determinants remain prominent in the wellbeing plan. A major factor behind the high burden of untimely mortality and health inequalities in South Africa is its unmistakable social disparities (Scott, 2017:78). As life expectancy increases and chronic conditions and injuries become more common, the undertakings of describing disability patterns and seeing how disability influences populations become progressively more relevant (UN, 2010). Most developing countries, especially those in sub-Saharan Africa (SSA), unlike North American and European nations, do not have estimates on which to put together policies concerning ageing, even though their populations of elderly persons (60 years or more) are growing quickly (WHO, 2016). A study by Wandera *et al.,* (2014: 2) states that functional limitations among elderly persons are associated with demographic, socio-economic, and health factors. Females were more associated with disability, where older women were at a higher risk of disability than their male counterparts. Hosseinpoor *et al.,* (2012:52) stated the sex differentials in functional limitations are attributed to the inequalities of socio-economic between men and women. There was, however, no correlation between disability and gender in a study in Southern California.

2.2. Levels and trends of selected chronic diseases in South Africa

Chronic NCDs, which represent around 66% of all diseases universally, are the main cause of mortality worldwide (United Nations, 2015). Risk factors for NCDs have increased with distinct gender patterns. The prevalence of high blood pressure was 43% among men and 41% among women in 2008, and physical inactivity was 46% among men and 56% among women while overweight and obesity were 58.5% among men and 71.8% among women. (Van-Wyk *et al.*, 2014:17). According to the study, 31% of men and 37% of women had raised blood cholesterol, and 5.9% of men and 2.0% of women used alcohol riskily. The cancer death rate for coloureds was 1.8 times higher than that for black Africans in 2010 (Nojilana *et al.,* 2016: 481).

The ratio between men and women is reversed for deaths caused by ischemic heart disease and stroke globally (Khan *et al.*, 2020:7). Decreasing fertility rates accompanied by increasing life expectancy has resulted in population ageing. At the global level, the elderly population is growing faster than the younger population. Among elderly men and women over 80 years old, the prevalence of at least one disability is about twice as high as among individuals aged 60 to 64 years old. The prevalence of disability is higher among females, but the rate of increase by age among males is much higher. In particular, men aged 80+ years are 2.23 times more likely than those aged 60 to 64 years to have at least one disability, while females are 1.93 times more likely (Tareque *et al.,* 2013:1304). According to Statistics South Africa (2014), the national disability prevalence rate was 7,5% in South Africa.

2.3. Risk factors of selected chronic diseases

The social and monetary developments that occur as countries develop, may clarify a portion of the contrasts between the examples of mortality and morbidity found in low-and middle-income countries and the patterns seen in high-income countries. (Scommegna, 2012:3). Demographic change is one of the main considerations of the expansion in NCD in low-income countries, to a great extent owing to the increase in the number of elderly persons who are at most risk of chronic disease-related deaths in South Africa by 2040 (Mayosi *et al.*, 2009:936). Epidemiological studies have distinguished numerous ecological and lifestyle risk factors for different sorts of chronic disease. In developing countries, the

lifestyle factors have been related to numerous diseases, including the four most common: hypertension, diabetes, stroke, and cancer (Koene *et al.,* 2016:1103).

The South African elderly population has significant levels of these risk variables, and huge levels of the burden of illness can be credited to these possibly modifiable risk factors. There are unmistakable contrasts between the sexes, with smoking and liquor use being increasingly regular in men, and obesity progressively common in women. Several non-communicable diseases such as cancer, diabetes, and cardiovascular issues share common risk factors such as tobacco use, unhealthy eating, and physical inactivity (Mayosi *et al.,* 2009:936). The World Health Organization argues that a reduction of 30% of disease deaths could be anticipated by changing or maintaining a strategic distance from certain hazard factors, including tobacco use, unhealthy diets, inactivity, liquor use, explicitly transmitted human papillomavirus contamination, urban air contamination, and indoor smoke from strong fuels (Koene *et al*., 2016:1104).

Access to health care services plays a major factor as a determinant on whether one has chances of surviving or not. As people age, their health status and healthcare needs increases. Ageing and health are growing concerns in Sub Saharan Africa (SSA). Two major concerns emerge: the "vulnerability of older persons to detrimental health outcomes." including high prevalence of NCDs and disabilities (Wandera *et al.,* 2015: 3). A study conducted in Uganda revealed that access to healthcare was higher for individuals older than 65 who had been sick for eight to fourteen days (83%), missed work for eight to fourteen days (81%), and reported at least one noncommunicable disease (80%). Additionally, those with a lot of sight difficulties (70%), walking difficulties (63%), and memory problems (55%), had less access to healthcare. Furthermore, those who were unable to take care of themselves (55%) and who had difficulty communicating (49%) often had limited access to health care. Overall, healthcare access for the disabled people was lower by 70% (Wandera *et al.,* 2015: 7).

Changes in food production and processing have affected health in the Eastern Mediterranean Region. The region’s burden of disease is 47% and it is due to non-communicable diseases caused by risk factors such as unhealthy diet (low intake of fruits and vegetables), physical inactivity, smoking, and obesity. The region includes countries

such as Iran, Cyprus, Jordan, Kuwait, Egypt, Turkey and Greece (Khatib, 2004:781). In South Asia, the prevalence of NCDs is also on the rise. The burden of NCDs in Asia now occupies 47% of the global burden of disease, accounting for almost half of all deaths. The findings revealed a high proportion of the population with raised blood-pressure, the prevalent use of tobacco by men, low consumption of fruits and vegetables, and women were associated with low levels of physical activity (Ahmed *et al.,* 2009:1986). Major findings of risk factors in Eastern Europe are tobacco use, high alcohol consumption as well as obesity due to unhealthy diets (Zatonski & Manczuk., 2011:204).

2.5 Determinants of chronic diseases

Age

The literature shows that chronic diseases and functional limitations increase with age; a study by Mwangi *et al*., (2015:3), found that elderly persons in their seventies were more likely to have chronic diseases than those in the early elderly ages (i.e. in their sixties) in rural Vietnam. Furthermore, a study in Ghana by Minicuci *et al*., (2014:6) found that elderly persons aged between 75–79 years were 1.9 times more likely to have chronic diseases compared to those aged 65 years and below, and elderly persons aged above 75 years reported a 5.3% prevalence rate. According to Hosseinpoor *et al.,* (2016:340), analysing 46 low- and middle-income countries, the prevalence of functional limitations increased significantly with each successively older age group, after controlling for covariates. The status quo seems to be similar across the globe.

Sex

According to Turabian (2018:1), sex differences have been accounted for in certain medical illnesses and it has been reported in hypertension and the prevalence of different kidney infections and kidney disorders. According to Turabian (2018:2), the prevalence of depression in females (9%) is nearly double that in males (5%), and one-third of females (33%) have chronic ailments. A study by Mwangi *et al.* (2015:3) argued that females were 1.5 times more likely to have a chronic disease contrasted with males. Chronic diseases such as lung illness, angina, melancholy, hypertension, and diabetes were higher among women than men (Minicuci *et al.,* 2014:6). According to Joubert and Bradshaw (2003: 155), hypertensive heart disease is accountable for more than double the proportion of deaths

among women, at 9.8%, compared to men at 4.2%. Stroke was the leading cause of death among women (17.7%) compared to men (12.2%). Diabetes was low among men (4%) compared to women (7.2%) in South Africa (Statistics South Africa, 2014).

Population group

According to Statistics South Africa (2014), black African elderly persons reported higher levels of functional limitations as compared to other population groups. They reported having problems with remembering/concentrating (5.2%), seeing (8.8%), walking or climbing of stairs (5.8%) and self-care (3.1%). However, the white population reported the lowest proportions across all functional areas, reported problems with seeing (2.5%), hearing (2.3%), and self-care (1.3%) (Statistics South Africa, 2014). However, black African elderly persons reported the least use of assistive devices, with glasses (22.3%), hearing aids (3.1%), wheelchair (2.9%) and chronic medication (34.0%) compared to the white elderly persons with the highest proportion of users of glasses (79.9%), hearing aids (10.0%), wheelchair (4.9%) as well as chronic medication (58.0%) (Statistics South Africa, 2014).

Marital status

According to Hosseinpoor *et al*., (2016:341), a variety of studies have indicated that unmarried elderly persons have a higher prevalence of chronic diseases and functional limitations than married elderly persons. Disability prevalence increases with advancing age. Married or cohabiting males or females are less likely to be disabled than elderly persons who are separated or divorced. Practically 50% of separated/widowed/separated respondents in the pooled dataset reported that they had functional limitations, which was altogether higher than those married/living together or never married. Except for Uruguay, the estimated prevalence of disability was greater among divorced/separated/widowed individuals than among married/cohabiting adults at a national level in all studied nations, and this difference was statistically significant in 36 countries (Hosseinpoor *et al*., 2016:341).

Socio-economic status

Educational attainment is directly related to one's socio-economic status, as well as the country in which one resides. Low income and unstable job statuses, which are likely to be linked to low educational level, are reasonably predicted to raise the risk of chronic diseases

(NCD) incidence (Bukova *et al.,* 2021: 1447). Equally, education has a positive relationship with health status, as education attainment is associated with decreased mortality rate and non-communicable diseases (Hoi *et al.*, 2009:471). A study by Choi *et al.*, (2011, 228) shows that higher educational achievement was related to a lower prevalence of the chronic conditions recorded in the investigation. In multivariable models, contrasted with the elderly who did not complete secondary school, college graduates had lower risk of chronic conditions, going from 11% lower chances of diminished kidney capacity to 37% lower chances of cardiovascular ailments (Choi *et al.*, 2011, 228).

According to Hosseinpoor *et al.*, (2016:341), overall, the prevalence of disability was inversely associated with educational level. After controlling other variables, the study shows that elderly persons who obtained primary education reported a higher prevalence of disability than those who completed high school and tertiary education. Furthermore, Fonta *et al.,* (2017:3), argue that functional limitations in all areas expanded with decreasing levels of education. Additionally, education level has been related to improved health results, with each extra year in school related to expanded life expectancy (Sanchez-Vaznaugh *et al.*, 2009:1102). According to existing research, those with a greater degree of education have lower self-reported chronic disease morbidity rates than those with a lower level of education (Cutler, 2007:55). Numerous studies have found a link between income and health status. Chronic diseases have traditionally been associated with the wealthy and their lifestyles in industrialized countries. Furthermore, the prevalence of impairment increased as household economic status declined. In several European countries, low income has been associated with poor health outcomes among the elderly (Minicuci *et al.,* 2014:1; Puoane *et al.*, 2008:75 & Hosseinpoor *et al.*, 2016:341).

Disability status

Functional limitations are activity or participation restrictions caused by the interplay of a health condition with variables that directly affect more than one billion people throughout the world (WHO, 2011). Every individual living with functional limitations represents a remarkable encounter, formed by their physiological condition just as the social and physical situations where they live and work. Individuals affected by functional limitations are at an increased risk for unexpected poor health conditions, higher reliance on other people,

reduced employment and earning potential, lower education attainment, and poor living conditions (WHO, 2011).

However, as functional limitations influence individuals of all ages, geographical location, sexual orientations, level of education, and socio-economic background, some groups might be bound to develop disabilities. Individuals and groups may vary in their capacity to oversee their general wellbeing and health conditions (Commission on Social Determinants of Health, 2008). Furthermore, females have reported higher rates of functional limitations than males, and an enormous assemblage of research underpins an inverse relationship between socio-economic status and prevalence of functional limitations (Mwangi *et al.*, 2015:3). The prevalence of disability was found to have a positive relationship with age. The age group 80+ had the highest levels of disability, with 63.2 percent. According to Statistics South Africa (2014), elderly persons aged 85 years and older had the highest proportions of disability with 53.2%, followed by age group 80-84 with 44.5%, with the age group 60-64 having the least proportion, 18.7%. Moreover, women reported higher levels of functional limitations compared to men; the proportion of elderly men and women's functional limitations were those of remembering (2.0%), seeing (1.9%), and walking (1.8%) (Statistics South Africa, 2014).

Geographical location

According to Medhi *et al.,* (2006:542), regardless of the geographical location, ageing is associated with a higher burden of chronic and non-communicable diseases and poorer physical functioning which unfavourably mark the health of elderly persons. A subjective report on the encounters and perceptions about NCD of individuals who moved from rural areas to a peri-urban township in South Africa found that members portrayed changes in eating patterns and levels of physical activity (Stern et al., 2010:5). According to Minicuci *et al.,* (2014:11), in Ghana, stress-related and unhealthy lifestyle-related diseases such as diabetes and hypertension are associated with elderly persons who reside in urban areas and have a higher income. Elderly persons who resided in urban areas had a high prevalence of diabetes, stroke, and hypertension. Also, urban residents had a higher prevalence of low levels of physical activity compared to rural residents, while joint inflammation, apparently because of a lifetime of physical work would be progressively predominant among provincial, lower-salary more seasoned people, as most rustic

Ghanaians are occupied with cultivating as the significant occupation (Minicuci *et al.*, 2014:11).

2.6 Theoretical framework

2.6.1 Social Determinants of Health (SDH)

The study used the Social Determinants of Health, which is defined by the United States Centers for Disease Control (US CDC) as "life-enhancing resources, such as food-supply, housing, economic and social relationships, transportation, education, and health care, whose distribution across populations effectively determines length and quality of life" (James, 2002 in Ramirez *et al.,* 2008: 6). There is a link between the fundamental causes of health inequalities and different social factors, and the conditions in which people live and work determine whether they become ill (Shokouh *et al.,* 2017:435). There are behavioural risk factors for non-communicable diseases (NCDs), resulting in intermediate changes in weight and body composition (i.e., metabolic risk factors), as well as opportunities to intervene in disease onset, expression, and outcome that are influenced by social conditions (Craig *et al.,* 2021: 4).

Structural determinants of socioeconomic position

Among the structural determinants of socioeconomic position are education, income, and occupation. Education is the most basic and widely used indicator of socioeconomic status that is interrelated with income and occupation. People usually benefit from education by being aware of risky health behaviours, finding relevant healthcare, and using that care effectively. An individual with a high education level is more likely to be influenced by healthy behaviours and lifestyles, and to be employed and living in better economic circumstances. An individual's occupation explains their position in social structure, access to resources, exposure to health risks, and impact on their lifestyle (Shokouh *et al.,* 2017:435). The second major factor in determining socioeconomic conditions is income. The level of income has a significant effect on employment, work conditions, and the number of resources available at any given time. The flow of economic resources over a period of time can be represented by income (Shokouh *et al.,* 2017:436).

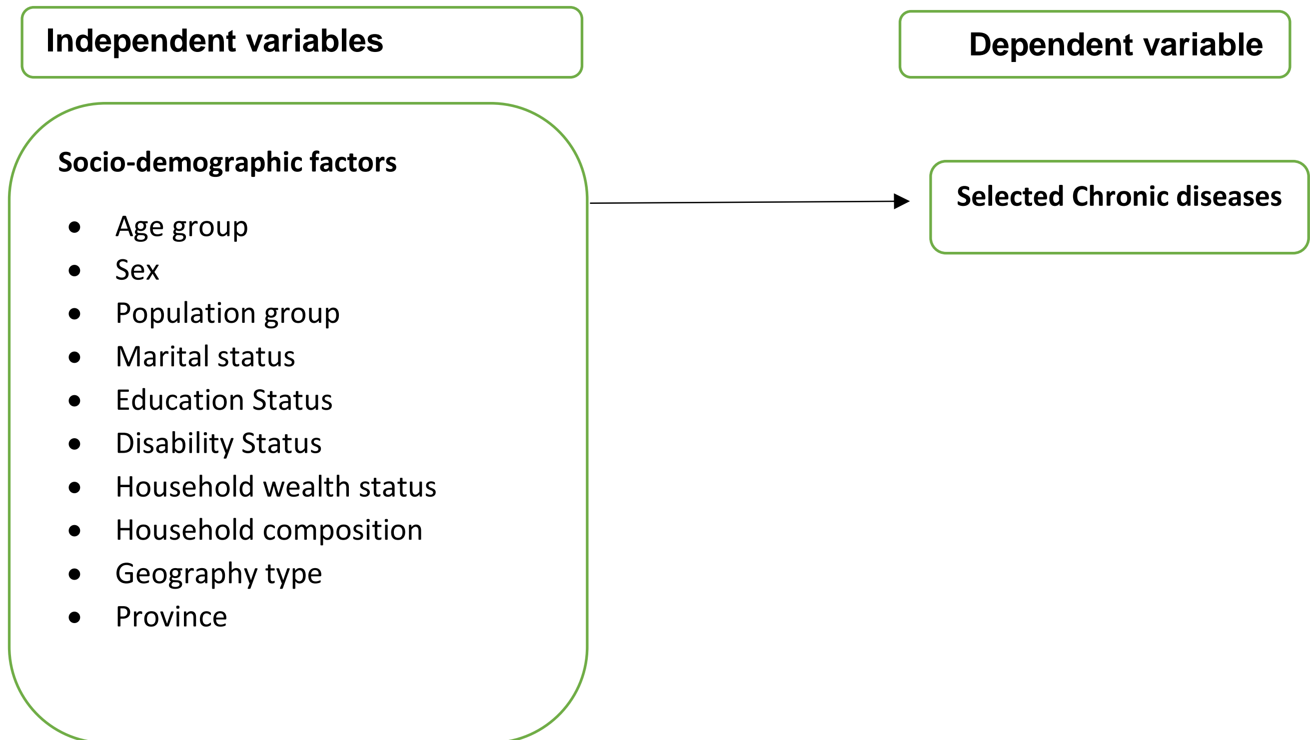
Intermediary determinants

Intermediary determinants include wealth or assets, household size, social capital, and trust, social and family support, health behaviour, housing, and cultural factors such as place of residence, and safety in the home and community. As a proxy of income, wealth and assets reflect assets accumulated over a person's lifetime and can be a measure of socioeconomic status. Income and wealth are positively related. In addition to income, wealth includes financial and physical assets such as a house, car, investments, heritage and pensions (Shokouh *et al.,* 2017:438). The social determinants of health (SDOH) can be grouped into five domains, namely: educational access and quality, economic stability, health care access and quality, neighbourhood and built environment, and last, the social and community context. SDOH has a major impact on people's health, well-being and quality of life. This model will be used to offer insight into the determinants of selected chronic diseases among the elderly population of South Africa. Lack of access to good nutrition as one of the five domains, for example will result in the risk of health conditions such as diabetes, stroke and hypertension, which might even decrease life expectancy relative to elderly persons which access to healthy food (Gomez *et al.,* 2021: 249).

2.7 Conceptual framework

The theory above speaks to various factors that determine one's health and wellbeing. This study focused on ten factors that fit the context of South Africa. Among these factors, the SDH highlights the following factors: age, sex, marital status, education, income, occupation, household wealth status, household size, family support, health behaviour, housing, and cultural factors such as place of residence as important factors that determine health and wellbeing. The study also included other variables as well, such as geographic type and disability status. The health status can be affected by whether one reside in an urban area or not, or whether one has functional limitations or not. Although, the theory does not mention them, they are included in the study because they fit the context of the country.

Figure 2.1: Conceptual framework on the determinants of chronic condition diagnosis



CHAPTER 3: METHODOLOGY

3.1 Study setting

The Republic of South Africa (RSA) is the southernmost nation in Africa. The country has nine provinces which are divided into 52 districts: 8 metropolitan areas and 226 local municipalities. South Africa, in 2019, had an estimated midyear population of 58.78 million individuals (Statistics South Africa, 2019). According to Census 2011 data, about 2.9 million households (19.9%) were headed by older people. Elderly persons are those above the age of 60 and constitute approximately 8% of the population (Statistics South Africa, 2019). Eastern Cape has the highest number of old people compared to adults and children (9.7%) (Statistics South Africa, 2019). The majority of senior people in South Africa have no formal education, according to the education profile of the elderly. (Statistics South Africa, 2019). With regards to living arrangements of elderly persons in households, it is reported that 50.6% of elderly persons live in extended households (Statistics South Africa, 2018). Data from Statistics South Africa show that in 2011, for every 100 working-age adults among the black Africans, there were just seven black African senior people in need of assistance, compared to 21 elderly white people in need of assistance for every 100 working-age white elderly people (Statistics South Africa, 2019).

Figure 3.1: Map of South Africa

Awesome Stories. 2021. Map of South Africa. [online image] [Accessed on 13 August 2021] URL

3.2 Data source

The study used data from the 2019 General Household Survey (GHS). According to Statistics South Africa (2019), the GHS was introduced in 2002 and it replaced the 1992 October Household Survey (OHS). The General Household Survey serves as a tool that traces the progress of development in South Africa. All private households in all nine provinces of South Africa are the target population of this survey. The survey looks at the level of development and quality of services in several key service sectors such as social security, health, education, housing, disability, household income, and access to food (Statistics South Africa, 2019).

A total of 21 908 households were successfully interviewed during face-to-face interviews (Statistics South Africa, 2019). The survey utilized a multi-stage sample design based on a stratified design with probability proportional to size selection at the first stage of primary sampling units (PSUs); at the second stage, it utilized a sampling of dwelling units (DUs) with systematic sampling and allocated the samples to the provinces (Statistics South Africa, 2019). According to Statistics South Africa (2019), the national response rate for the survey is 88.6%. There were some differentials in the response rates according to the South African provinces. The province with the highest response rates was Limpopo (98.8%) and the province with the lowest response rates was Gauteng, with 75% (Statistics South Africa, 2019).

3.3 Study Variables

Dependent variables

The dependent variable of the study is selected chronic diseases. The dependent variable is based on an individual's self-reported health status. The survey asked individuals to answer the following question concerning selected chronic illnesses that were reported by a health practitioner: "*Has a doctor/nurse/other healthcare workers at a clinic/hospital/private practice ever told .... that he/she has/had any of the following*?" Respondents were then requested to answer with a "yes" or "no" for each of the items on the lists that were read to them. Although the illnesses are self-reported in terms of the survey, the key is that the respondents must have been diagnosed by a health practitioner. This study will focus on the following types of chronic diseases: cancer, diabetes, hypertension, arthritis, and stroke.

Table 3.1(a): Dependent variable (definition and categorisation)

Variable	Definition	Code
Selected Chronic disease	The types of chronic diseases to be assessed are as follows: cancer, diabetes, hypertension, arthritis, and stroke.	Yes = 1 No = 0

Table 3.1(b): Independent variables (definitions and categorisation)

Variable	Definition	Code
Age group	Age in completed years of the individual (grouped into five-year age groups). Age at the last birthday.	60-64 = 0 65-69 = 1 70-74 = 2 75-79 = 3 80+ = 4
Sex	Defined as either male or female participant	Male = 1 Female = 2
Population group	Population groups of respondents	Black African = 1 Coloured = 2 Indian/Asian = 3 White = 4
Marital status	Marital status of the individual. To ascertain whether there are differences between married and unmarried persons	Married = 0 Cohabiting = 1 Never married = 2 Previously married = 3
Educational status	The educational attainment of respondents was obtained by asking the respondents. What is the highest level of education that has been completed?	No schooling = 0 Primary = 1 Secondary = 2 Higher = 3 Other/DNK = 4
Disability status	Questions related to functional limitations and state their ability to perform certain activities such as seeing, hearing, walking, remembering and communicating. This variable measures the degree of difficulty in any of the six domains of functioning.[1]	No difficulty = 0 Some difficulty = 1 A lot of difficulty = 2 Cannot do at all = 3
Household Wealth Status	What is the economic status of a household?	Poor = 0 Average = 1 Rich = 2

[1] See: https://www.washingtongroup-disability.com/

Variable	Definition	Code
Household composition	This will be one of the variables that will assess the living arrangements of the elderly persons	Lone male = 0 Lone female = 1 Nuclear, male headed = 2 Nuclear, female headed = 3 Extended, male headed = 4 Extended, female headed = 5 Complex = 6
Geography type	Whether you reside in an urban area or rural	Urban = 0 Traditional = 1 Farms = 2
Province	This represents the nine South African provinces	Western Cape = 1 Eastern Cape = 2 Northern Cape = 3 Free State = 4 KwaZulu-Natal = 5 North West = 6 Gauteng = 7 Mpumalanga = 8 Limpopo = 9

3.4 Sample

The study sample is based on individuals aged 60 years and older. The study sample is made up of individuals aged 60 years and older whose information was collected through the GHS. Therefore, the study sample for this study was based on a population of 4 887 334 (weighted) individuals aged 60 years and older.

3.5 Method of analysis

The study examined the prevalence of selected chronic diseases among elderly persons in South Africa. Data analysis was done in three stages including univariate, bivariate, and multivariate. Descriptive statistics was the first part of the analysis and was used to describe the study population. Frequency tables and percentages were utilised to describe the study population. At the bivariate analysis level, a chi-square test (χ^2) was utilized to explore the association between chronic diseases and functional limitations for each of the selected background characteristics. At this level, selected chronic diseases were studied. The

Pearson chi-square test was chosen because of the precise nature of the dependent and independent variables (Minicuci, 2014:12). At the multivariate level, the study used logistic regression to analyse the relationship between having the outcome variable and the selected background characteristics. Multivariate logistic regression was employed due to the binary nature of the dependent variable. Data were analysed using Stata version 16 (StataCorp, 2019).

3.6 Limitations

A small degree of bias may be inevitable in research. The 2019 General Household Survey did not include institutionalized people, because the statistics do not include older persons who live in institutions, they are not representative of this key component of the aged population. Therefore, it is not possible to know from this dataset the living arrangements of this population in terms of those living in old-age homes, and those in hospitals, etc. Disability is a very difficult concept to measure. There is also likely to be recall bias since respondents had to recall whether or not they were diagnosed with certain chronic conditions (*the focus of this study*). The self-reported nature of the outcome variable may also bring about some bias and non-reporting of some chronic conditions that have some attached stigma to them. However, the strength of this study lies in the fact that there are not many other studies similar to this one in South Africa.

3.7 Ethical considerations

The information collected by Statistics South Africa in their surveys followed all the necessary ethical considerations. The study used secondary data from the General Household Survey 2019. The data was freely available for download and usage. The study applied for ethical clearance from North-West University, and the approval was provided (ethics number: NWU-00695-21-A7) by the Basic and Social Sciences Research Ethics Committee (BaSSREC).

CHAPTER 4: DATA ANALYSIS AND RESULTS

4.1 Introduction

This section of the study constitutes the analysis of data as well as interpretation and results of the determinants of selected chronic diseases among the elderly population of South Africa using the GHS 2019, produced by Statistics South Africa. Frequency and percentages were used to describe the study participants.

4.2 Characteristics of the study population

Table 4.1: Characteristics of elderly persons in South Africa

Characteristics	Population	Percentage
Diagnosed with selected conditions		
No	2 436 233	49.8
Yes	2 451 101	50.2
Age group		
60-64	1 688 426	34.5
65-69	1 275 770	26.1
70-74	865 397	17.7
75-79	528 121	10.8
80+	529 620	10.8
Sex		
Male	1 964 263	40.2
Female	2 923 071	59.8
Population group		
Black	3 115 365	63.7
Coloured	491 385	10.1
Indian/Asian	189 309	3.9
White	1 091 275	22.3
Marital status		
Married	2 206 526	45.1
Cohabiting	148 726	3.0
Never married	549 359	11.2
Previously married	1 982 722	40.6
Educational level		
No education	784 115	16.0
Primary	1 447 427	29.6
Secondary	1 932 442	39.5
Higher	590 376	12.1
Other/DNK	132 974	2.7
Disability status		
No difficulty	2 884 304	59.0
Some difficulty	1 261 008	25.8
A lot of difficulty	592 843	12.1
Cannot do at all	149 180	3.1
Household wealth status		

Characteristics	Population	Percentage
Poor	1 264 943	25.9
Average	809 555	16.6
Rich	2 812 836	57.6
Household composition		
Lone male	222 170	4.5
Lone female	257 123	5.3
Nuclear, male-headed	1 174 293	24.0
Nuclear, female-headed	325 401	6.7
Extended, male-headed	1 341 888	27.5
Extended, female-headed	1 448 727	29.6
Complex	117 732	2.4
Geography type		
Urban	3 170 489	64.9
Traditional	1 548 795	31.7
Farms	168 050	3.4
Province		
Western Cape	634 944	13.0
Eastern Cape	688 845	14.1
Northern Cape	124 647	2.6
Free State	265 665	5.4
KwaZulu-Natal	851 096	17.4
North West	359 075	7.3
Gauteng	1 183 106	24.2
Mpumalanga	329 609	6.7
Limpopo	450 348	9.2
South Africa	4 887 334	**100.0**

Table 4.1 presents the characteristics of the study population. The results show that 50.2% of elderly persons reported being diagnosed with the selected chronic conditions. The majority (34.5%) of elderly persons were aged 60-64 years and the lowest number were those aged 75+ years (10.8%). Females made up the majority of the elderly population with 59.8%, and the males made up the lower portion of the elderly population, with 40.2%. Black Africans made up the majority of the elderly population with 63.7%, followed by the white population group with 22.3%, then the coloured population group with 10.1%; the Indian/Asian population group made up the lowest population group with 3.9%. Elderly persons that were married made the highest portion of the total elderly population with 45.1%, followed by elderly persons who were previously married with 40.6%, then those who were never married with 11.2%. Elderly persons that were cohabiting made the lowest portion of the total elderly population with 3%.

The majority of the elderly population had obtained secondary education with 39.5%, followed by primary education with 29.6%, then 16.0% of the elderly population had no

formal education; 12.1% of the elderly population had obtained a higher education and only 2.7% of the elderly population reported to have other forms of educational status or did not know the type of education they had obtained. The disability status of the elderly population shows that the majority of the elderly population reported that they had no difficulty, which was 59%, followed by 25.8% of elderly persons who reported to have had some difficulty, then 12.1% who reported to have had a lot of difficulties. However, only 3.1% of elderly persons reported that they cannot do things at all. The household wealth status shows that 57.6% of the elderly population reported that they were from rich households and 25.9% were from poor households.

The majority (29.6%) of elderly persons were from extended female-headed households, followed by those from extended male-headed households (27.5%), and the lowest percentage (2.4%) was from complex households (these households include related and unrelated persons). The majority of the elderly population resided in urban areas with 64.9%, followed by elderly persons who resided in traditional areas with 31.7%, then the lowest percentage of elderly persons resided in farms, with 3.4%. Moreover, the majority of elderly persons resided in Gauteng province with 24.2%, followed by KwaZulu-Natal with 17.4%, then Eastern Cape with 14.1%. Northern Cape had the least number of elderly persons with 2.6%, while the Free State province had the second-lowest number of elderly persons, 5.4%, and Mpumalanga with 6.7%, had the third-lowest number of elderly persons in South Africa.

Figure 4.1(a): Percentage distribution of elderly persons with selected diagnoses

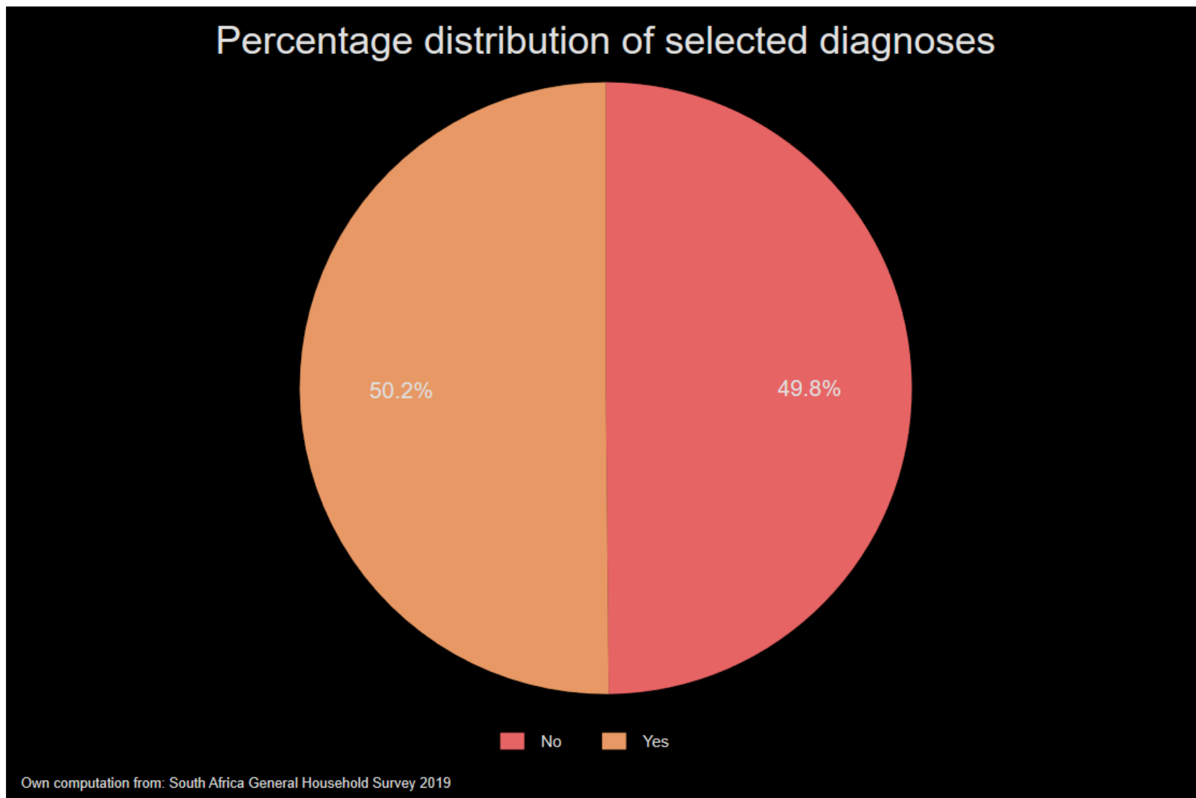


Figure 4.1(b): Percentage distribution of elderly persons with selected diagnoses by type

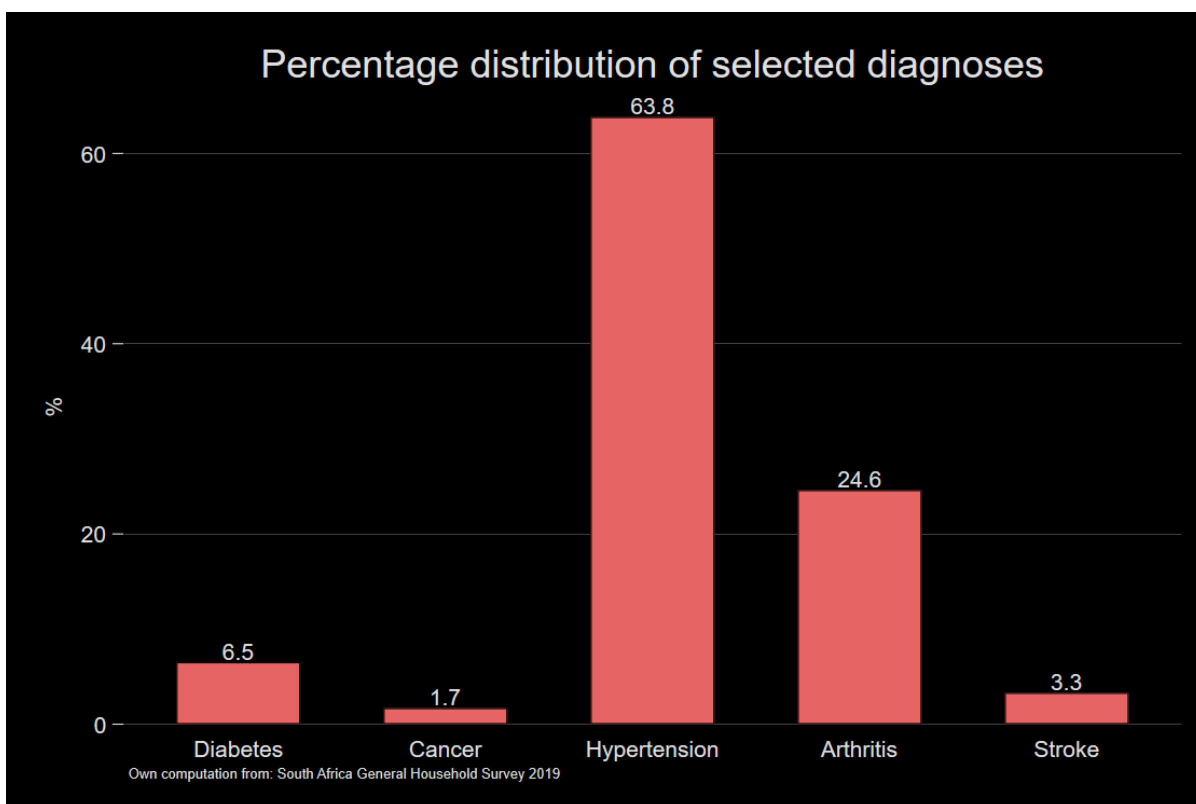


Figure 4.1(a) shows the percentage distribution of elderly persons with selected diagnosis. The figure shows that 50.2% of elderly persons reported being diagnosed with the selected chronic conditions. Figure 4.1(b) is based on those elderly persons who reported being diagnosed with the selected chronic conditions. The majority (63.8%) of elderly persons reported that they were diagnosed with hypertension, followed by 24.6% diagnosed with arthritis and 6.5% diagnosed with diabetes. Only 1.7% of elderly persons reported that they were diagnosed with cancer, and 3.3% with stroke.

4.3 Association between chronic conditions and background characteristics

Table 4.2: Prevalence of chronic conditions diagnosis by background characteristics

Characteristics	Diagnosed with selected chronic conditions				χ^2	
	No	Yes	Prevalence%	Total	Value	P-value
Age group					77,5	0,000
60-64	920 686	767 740	45,5	1 688 426		
65-69	662 828	612 943	48,0	1 275 770		
70-74	366 983	498 414	57,6	865 397		
75-79	249 925	278 195	52,7	528 121		
80+	235 812	293 809	55,5	529 620		
Sex					146,6	0,000
Male	1 142 672	821 591	41,8	1 964 263		
Female	1 293 561	1 629 510	55,7	2 923 071		
Population group					72,5	0,000
Black	1 404 015	1 711 349	54,9	3 115 365		
Coloured	275 230	216 155	44,0	491 385		
Indian/Asian	107 578	81 731	43,2	189 309		
White	649 410	441 866	40,5	1 091 275		
Marital status					75,4	0,000
Married	1 198 283	1 008 243	45,7	2 206 526		
Cohabiting	91 383	57 343	38,6	148 726		
Never married	280 108	269 251	49,0	549 359		
Previously married	866 459	116 263	5,9	1 982 722		
Educational level					24,9	0,000
No education	380 111	404 004	51,5	784 115		
Primary	660 656	786 771	54,4	1 447 427		
Secondary	980 484	951 958	49,3	1 932 442		
Higher	347 509	242 867	41,1	590 376		
Other/DNK	67 473	65 501	49,3	132 974		

Characteristics	Diagnosed with selected chronic conditions				χ^2	
	No	Yes	Prevalence%	Total	Value	P-value
Disability status					98,9	0,000
No difficulty	156558	1318746	45,7	2884304		
Some difficulty	546077	714931	56,7	1261008		
A lot of difficulty	255111	337732	57,0	592843		
Cannot do at all	69489	79691	53,4	149180		
Household wealth status					0,5	0,785
Poor	615 278	649 665	51,4	1 264 943		
Average	385 663	423 892	52,4	809 555		
Rich	1 435292	1 377 543	49,0	2 812 836		
Household composition					85,3	0,000
Lone male	126 255	95 915	43,2	222 170		
Lone female	133 719	123 404	48,0	257 123		
Nuclear, male headed	626 033	548 260	46,7	1 174 293		
Nuclear, female headed	166 440	158 961	48,9	325 401		
Extended, male headed	721 551	620 337	46,2	1 341 888		
Extended, female headed	597 518	851 209	58,8	1 448 727		
Complex	64 718	53 014	45,0	117 732		
Geography type					0,4	0,809
Urban	1 610371	1 560 118	49,2	3 170 489		
Traditional	743 147	805 648	52,0	1548 795		
Farms	82 715	85 335	50,8	168 050		
Province					14,8	0,000
Western Cape	357 423	277 520	43,7	634 944		
Eastern Cape	304 509	384 336	55,8	688 845		
Northern Cape	62 768	61 879	49,6	124 647		
Free State	127 833	137 832	51,9	265 665		
KwaZulu-Natal	363 544	487 552	57,3	851 096		
North West	171 935	187 140	52,1	359 075		
Gauteng	608 006	575 100	48,6	1 183 106		
Mpumalanga	156 861	172 748	52,4	329 609		
Limpopo	283 354	166 994	37,1	450 348		
South Africa	**2 436 233**	**2 451 101**	**50,2**	**4 887 334**		

Table 4.2 shows the prevalence and association between selected chronic conditions and the background characteristics. The findings show that there is an association between the selected chronic conditions and the following factors: age, sex, population group, marital status, educational level, disability status, household composition, and province. These

factors were statistically significant at $p<0.000$. The age group (70-74) had the highest prevalence (57.6%) of being diagnosed with chronic conditions followed by those aged 80 years and older with a prevalence of 55.5%. Those in their early sixties (60-64) had the lowest prevalence of 45.5%. In addition, the findings show that females had the highest prevalence, 55.7%, of being diagnosed with chronic conditions compared to males, who had a prevalence of 41.8%. The Black population group had the highest prevalence of being diagnosed with chronic conditions (54.9%), while the White population group had the lowest prevalence of being diagnosed with chronic conditions (40.5%). Never-married persons had a higher prevalence of being diagnosed with chronic conditions (49.0%), while those who were previously married had the lowest prevalence of 5.9%.

In terms of educational level, persons whose highest level of educational attainment was primary education had the highest prevalence of being diagnosed with chronic conditions (54.4%), while those with higher education had the lowest prevalence of 41.1%. Furthermore, persons with a lot of difficulty in any of the six disability domains had the highest prevalence of being diagnosed with selected chronic conditions (57%), while those with no difficulty had the lowest prevalence of being diagnosed with selected chronic conditions (45.7%). Looking at the household composition, persons from female-headed extended households had the highest prevalence (58.8%) of being diagnosed with selected chronic conditions, while those from complex households had the second-lowest prevalence of being diagnosed with chronic conditions (45%). In terms of geographical indicators, persons from traditional areas had the highest prevalence (52.0%) of being diagnosed with selected chronic conditions, while those from urban areas had the lowest prevalence of being diagnosed with chronic conditions, at 49.2%. Persons from KwaZulu-Natal had the highest prevalence (57.3%) of being diagnosed with selected chronic conditions, while those from Limpopo province had the lowest prevalence of being diagnosed with chronic conditions at 37.1%.

4.4 Determinants of chronic condition diagnoses by background characteristics

Table 4.3: Binary logistic regression on the determinants of being diagnosed with selected chronic conditions

Characteristics	Odds ratio	Std. err.	t	Sig.	95% C.I.	
					Lower	Upper
Age group						
60-64®	1,00					
65-69	1,11	0,08	1,43	0,152	0,96	1,28
70-74	1,65	0,15	5,64	0,000	1,39	1,97
75-79	1,37	0,15	2,87	0,004	1,11	1,70
80+	1,40	0,16	2,95	0,003	1,12	1,75
Sex						
Male®	1,00					
Female	1,78	0,13	7,65	0,000	1,54	2,06
Population group						
Black®	1,00					
Coloured	0,51	0,07	-4,81	0,000	0,38	0,67
Indian/Asian	0,37	0,08	-4,68	0,000	0,24	0,56
White	0,39	0,05	-7,80	0,000	0,30	0,49
Marital status						
Married	1,39	0,22	2,10	0,036	1,02	1,90
Cohabiting®	1,00					
Never married	1,28	0,22	1,43	0,154	0,91	1,81
Previously married	1,75	0,29	3,42	0,001	1,27	2,42
Educational level						
No education®	1,00					
Primary	1,19	0,10	2,01	0,044	1,00	1,40
Secondary	1,19	0,11	1,76	0,079	0,98	1,43
Higher	1,04	0,15	0,30	0,767	0,79	1,38
Other/DNK	1,13	0,22	0,63	0,531	0,77	1,65
Disability status						
No difficulty®	1,00					
Some difficulty	1,42	0,10	4,92	0,000	1,23	1,63
A lot of difficulty	1,32	0,13	2,90	0,004	1,09	1,59
Cannot do at all	1,31	0,23	1,51	0,131	0,92	1,86
Household wealth status						
Poor	0,73	0,07	-3,13	0,002	0,59	0,89
Average	0,83	0,08	-2,01	0,045	0,69	1,00
Rich®	1,00					
Household composition						

Characteristics	Odds ratio	Std. err.	t	Sig.	95% C.I.	
					Lower	Upper
Lone male	0,78	0,12	-1,59	0,111	0,57	1,06
Lone female	0,52	0,09	-3,89	0,000	0,38	0,73
Nuclear, male headed®	1,00					
Nuclear, female headed	0,61	0,10	-3,16	0,002	0,45	0,83
Extended, male headed	0,70	0,07	-3,58	0,000	0,58	0,85
Extended, female headed	0,69	0,09	-2,79	0,005	0,53	0,89
Complex	0,64	0,15	-1,95	0,051	0,41	1,00
Geography type						
Urban®	1,00					
Traditional	0,96	0,09	-0,44	0,663	0,80	1,15
Farms	1,20	0,23	0,97	0,333	0,83	1,75
Province						
Western Cape	2,01	0,34	4,19	0,000	1,45	2,80
Eastern Cape	2,24	0,25	7,13	0,000	1,80	2,80
Northern Cape	1,86	0,34	3,37	0,001	1,30	2,67
Free State	1,82	0,33	3,32	0,001	1,28	2,59
KwaZulu-Natal	2,68	0,32	8,14	0,000	2,11	3,39
North West	1,98	0,27	4,97	0,000	1,51	2,60
Gauteng	1,93	0,25	5,00	0,000	1,49	2,50
Mpumalanga	1,92	0,27	4,69	0,000	1,46	2,52
Limpopo®	1,00					
_cons	0,32	0,07	-5,23	0,000	0,21	0,49

Note: ® = reference category

Table 4.3 shows the multivariate analysis for the determinants of being diagnosed with selected chronic conditions among the elderly population of South Africa. The findings show that persons aged 70-74 years were 1.65 [95% CI: 1.39–1.97] times more likely to be diagnosed with selected chronic conditions compared to those aged 60-64 years. Those aged 75–79 years were 1.37 [95% CI: 1.11–1.70] times more likely to be diagnosed with selected chronic conditions compared to those aged 60-64 years. Additionally, elderly persons 80 years and older were1.40 [95% CI: 1.12–1.75] times more likely to be diagnosed with selected chronic conditions compared to those aged 60-64 years. Females were 1.78 times [95% CI: 1.54–2.06] more likely to be diagnosed with selected chronic conditions compared to males. Moreover, in terms of the population group, Coloured persons were 0.51 [95% CI: 0.38–0.67] times less likely to be diagnosed with selected chronic conditions compared to the Black population group. The Indian/Asian elderly persons were 0.37 [95%

CI: 0.24–0.56] times less likely to be diagnosed with selected chronic conditions compared to the Black population group. Furthermore, persons from the White population group were 0.39 [95% CI: 0.30–0.49] times less likely to be diagnosed with selected chronic conditions compared to the Black population group.

In addition, persons who were previously married were 1.75 [95% CI: 1.27–2.42] times more likely to be diagnosed with selected chronic conditions compared to those who were cohabiting. Those who were married were 1.39 [95% CI: 1.02–1.90] times more likely to be diagnosed with selected chronic conditions compared to those who were cohabiting. Persons whose highest educational level was primary education were 1.19 [95% CI: 1.00–1.40] times more likely to be diagnosed with selected chronic conditions compared to those with no education. Moreover, persons whose disability status was 'some difficulty' were 1.42 [95% CI: 1.23–1.63] times more likely to be diagnosed with selected chronic conditions compared to persons whose disability status was 'no difficulty'. Persons whose disability status was 'a lot of difficulty' were 1.32 [95% CI: 1.09–1.59] times more likely to be diagnosed with selected chronic conditions compared to persons whose disability status was 'no difficulty'. Being diagnosed with chronic conditions increased with the wealth status. Persons from poor households were 0.73 [95% CI: 0.59–0.89] times less likely to be diagnosed with selected chronic conditions compared to those from rich households. Persons from average-wealth households were 0.83 [95% CI: 0.69–1.00] times less likely to be diagnosed with selected chronic conditions compared to persons from rich households.

The findings further show that household composition was an important predictor of being diagnosed with the selected chronic conditions. Persons who resided in lone female-headed households were 0.52 [95% CI: 0.38–0.73] times less likely to be diagnosed with selected chronic conditions compared to those from male-headed nuclear households. Female-headed nuclear households were 0.61 [95% CI: 0.45–0.83] times less likely to be diagnosed with selected chronic conditions compared to those from male-headed nuclear households. Persons from extended male-headed households were 0.70 [95% CI: 0.58–0.85] times less likely to be diagnosed with selected chronic conditions compared to those from male-headed nuclear households. Moreover, persons from extended female-headed households were 0.69 [95% CI: 0.53–0.89] times less likely to be diagnosed with selected chronic conditions compared to those from male-headed nuclear households.

In terms of the province, persons who resided in Western Cape were 2.01 [95% CI: 1.45–2.80] times more like to be diagnosed with selected chronic conditions compared to those from Limpopo province. Persons who resided in Eastern Cape were 2.24 [95% CI: 1.80–2.80] times more likely to be diagnosed with selected chronic conditions compared to those from Limpopo province. Moreover, those who resided in KwaZulu-Natal were 2.68 [95% CI: 2.11–3.39] times more likely to be diagnosed with selected chronic conditions compared to those from Limpopo province. Persons who resided in Gauteng were 1.93 [95% CI: 1.49–2.50] times more likely to be diagnosed with selected chronic conditions compared to those from Limpopo province.

CHAPTER 5: DISCUSSION AND CONCLUSION

5.1 Introduction

The study aimed to examine the determinants of selected chronic diseases among elderly persons in South Africa. Univariate, bivariate and multivariate analyses were run to answer the study objectives. This section provides a discussion of the main findings, as well as the conclusion and recommendations.

5.2 Main findings and discussion

The study also shows that 50.2% of elderly persons who were 60 years and older reported being diagnosed with the selected chronic conditions. With more than half of the elderly population being diagnosed with the selected chronic conditions, an increasing number of deaths from diabetes, chronic kidney disease, and prostate cancer demonstrate the rising burden of noncommunicable diseases. The burden is more prominent in the rural areas, and this also affects those poor people living in urban areas, which causes an increased demand for chronic disease care, putting pressure on the already weak public health care system of South Africa (Mayosi *et al.,* 2009: 938). The findings are consistent with the Agincourt study, which estimated that the increased need for chronic medical care is due to rising morbidity and mortality related to non-communicable diseases which has impacted the delivery of acute and chronic health-care services (Tollman *et al.*, 2008:894).

The findings showed that persons aged 70 years and older had a higher prevalence of being diagnosed with chronic conditions than those in their early elderly years. These findings are similar to those of other studies. Several studies have revealed that people in their seventies are more likely than those in their early elderly years to have chronic diseases, and that as people age, they become more sensitive to ill health from acute and chronic diseases (Mwangi *et al.,* 2015: 3; Villar, 2012: 1089; Hosseinpoor *et al.,* 2016:340). However, a study found that it was those in their early elderly years who had a higher prevalence of chronic diseases, and this decreased with age (Hopman *et al.,* 2009:113). The findings in the study show that elderly females had a higher prevalence of selected chronic conditions than their male counterparts. Several studies are in agreement with the findings which states that chronic diseases such as lung illness, angina, melancholy, hypertension, and diabetes were higher among women than men; another study found that the prevalence of depression in females is nearly double that in males, and one-third of females have chronic ailments

compared to males. Hypertensive heart disease was accountable for double the number of deaths of females compared to males, and stroke was the leading cause of death among women compared to men (Minicuci *et al.,* 2014:6; Turabian 2018:2; Joubert & Bradshaw 2003:155).

Additionally, females were more likely to be diagnosed with selected chronic conditions compared to males. A study which supports the findings also found that females were more likely to have a chronic disease contrasted with males. Men and women have distinct expectations and behaviours, which affect chronic illness incidence and outcomes, such as cigarette use, exercise, and seeking treatment. Other significant distinctions include the fact that women are more likely than males to be impacted by chronic diseases at a younger age. Women live longer than males, but with more disability and less social security (Mwangi *et al*., 2015:3; Mayosi *et al*., 2009:930). However, the findings are contradicted among western counterpart elderly population, with men having a higher prevalence of chronic diseases. Another study discovered that males were more likely than females to suffer from cardiovascular problems (Orfila *et al.,* 2006: 2370; Öztürk, 2011: 280).

The findings show that there are racial differentials in being diagnosed with chronic diseases. The Black population group, followed by the Coloured population group, had the highest prevalence of selected chronic conditions, while the White population group had the lowest prevalence of selected chronic conditions. Moreover, coloured and white elderly persons were less likely to be diagnosed with selected chronic conditions compared to black elderly persons. A report released by Statistics South Africa reported that black elderly persons reported higher levels of chronic conditions as compared to other population groups, and a study in Pretoria found that Indians and Whites had a lower prevalence of chronic diseases compared to the black population (Statistics South Africa, 2014; Horowitz *et al.,* 2017: 248). Studies show that the economic status of back elderly persons contributed to their health status. Residents in urban townships have been exposed to a variety of non-communicable diseases as a result of their unhealthy lifestyles such obesity, hypertension, and diabetes mellitus (Puoane & Tsolekile, 2008:6). The fact that being overweight is regarded as a sign of luxury; individuals who have relocated to the city are often admired and complimented when they visit rural areas which is one of the challenges experienced by the black community in maintaining an ideal body weight (Puoane & Tsolekile, 2008:6).

The study shows that elderly persons who were never married had a higher prevalence of selected chronic conditions, and elderly persons who were previously married were more likely to be diagnosed with selected chronic conditions compared to elderly persons who were cohabiting. A variety of studies have shown that unmarried elderly persons have a higher prevalence of being diagnosed with chronic diseases and functional limitations than married elderly persons. Adults who are married have better health results than those who are not. For a variety of reasons, married people may have better health results. First, healthier people may be more likely to marry and stay married longer as a result of marital selection, whereas less healthy people may be more likely to be single, separated, or divorced. The marital protection effect, on the other hand, relates to the fact that married people have more advantages in terms of economic resources, social and psychological support, and health behaviour. Third, divorce is a stressful event that has an impact on one's health (Hosseinpoor *et al.,* 2016:341; Kim, 2018:102).

Higher levels of education were linked to a reduced prevalence of chronic diseases and elderly persons whose highest level of educational attainment was primary education had the highest prevalence of selected chronic conditions, and elderly persons whose highest level of educational attainment was higher education had the lowest prevalence. Studies show that higher educational achievement was related to a lower prevalence of being diagnosed with chronic conditions, which support the findings in the study, and the level of education is lower in women. The findings are also consistent with a study which found higher levels of education were linked to a reduced prevalence of chronic diseases. University graduates showed a decreased risk of chronic disease in multivariable models compared to those who did not complete high school (Choi *et al.,* 2011: 228; Öztürk, 2011: 280).

According to Hoi *et al.,* (2009:471), education has a positive relationship with health status. Educational attainment is associated with decreased mortality rate and non-communicable diseases. The findings in the study show that elderly persons whose highest educational attainment was primary education and those whose highest educational attainment was secondary education both were more likely to be diagnosed with selected chronic conditions compared to elderly persons who had higher educational attainment, which shows that the

better the educational attainment, the better the health. The above is in-line with the socio determinant of health theory which states that an individual with a high education level is more likely to be influenced by healthy behaviours and lifestyles, and to be employed and living in better economic circumstances.

A relationship exists between disability and poor health status; this could be the result of disabilities emerging from chronic conditions. Elderly persons with disabilities are more at risk of being diagnosed with chronic conditions. Moreover, the study found out that elderly persons with disability status of “a lot of difficulty” had the highest prevalence of selected chronic conditions. Elderly persons with a disability status of “no difficulty” had the lowest prevalence of selected chronic conditions. Moreover, elderly persons whose disability status was “some disability” were more likely to be diagnosed with selected chronic conditions compared to elderly persons whose disability status was “no difficulty.” A study shows that people with lifelong disabilities had significantly higher odds of all chronic conditions compared with people without limitations (Dixon-Ibarra & Horner-Johnson, 2014:45).

The analysis to determine whether household composition is associated with being diagnosed with the selected chronic conditions shows that the elderly female-headed extended household had the highest prevalence of selected chronic conditions. Moreover, the elderly female-headed extended households were less likely to be diagnosed with selected chronic conditions compared to elderly nuclear, male-headed households. Female-headed nuclear households were less likely to be diagnosed with selected chronic conditions compared to elderly nuclear, male-headed households. Elderly nuclear female-headed households were less likely to be diagnosed with selected chronic conditions compared to elderly nuclear, male-headed households. Studies have shown that an individual’s health status is related to the number of people in his or her household. Households with one or two individuals have a higher prevalence of chronic disease than larger households. Previous studies have found that individuals who live alone are more likely to engage in an irregular lifestyle and unhealthy behaviours, which worsen their health. Household members act as social controls to promote healthy behaviours. Households with fewer individuals have fewer interactions which can contribute to less management of unhealthy behaviours, leading to poor health outcomes (Noh *et al.,* 2017: 165; Lawn & School, 2010: 207; Han & Lee, 2015: 2012).

The findings reinforce previous research which shows that the selected chronic conditions were influenced by province of residence. The elderly persons who resided in Western Cape were more likely to be diagnosed with selected chronic conditions compared to elderly persons who resided in Limpopo province, and elderly persons who resided in Eastern Cape were more likely to be diagnosed with selected chronic conditions compared to elderly persons who resided in Limpopo province. Additionally, those who resided in Mpumalanga were more likely to be diagnosed with selected chronic conditions compared to elderly persons who resided in Limpopo province. Elderly persons who had the highest prevalence of selected chronic conditions resided in KwaZulu-Natal, and the lowest were in Limpopo province. A study in conducted in western Cape has found that the province recorded the highest number of deaths due to diabetes compared to other provinces of South Africa. Possible risk factors assessed by the study were physical inactivity, excessive alcohol consumption, long term tobacco use and poor diets. The most prevalent comorbid disease was diabetes and hypertension, according to a South African study that analysed data from primary healthcare facilities in four provinces and an important additional finding of the study was poor disease control in Western Cape.

Elderly persons in Western Cape face a variety of challenges, including poverty, acting as caregivers for grandchildren, crime, abuse, social isolation, loneliness, and a marginalized position within their community (Baerecke., 2015). Elderly persons can better their health conditions through improved access to quality services that enable older people to maximize and retain their independence, the need to value older people as individuals and not Stereotype them based on their age, the need to stay socially and intellectually active, providing 24-hour, on-call medical services, as well as access to tutors, students, or teachers for skill development activities and facilitating physical activity (Solomons *et al.,* 2019:82; Sheik *et al.,* 2016:46).

5.3 Conclusion

The study sought to examine the determinants of selected chronic diseases among elderly persons in South Africa. In the process, the study considered the risk factors of the selected chronic conditions and looked at the global levels and trends of selected chronic diseases. Moreover, it also assessed the profile of elderly persons and selected chronic conditions in South Africa by background characteristics and investigated the association between

selected chronic conditions and the background characteristics of elderly persons. Lastly, the study examined the predictors of selected chronic conditions among the elderly by background characteristics. The study found that there has been an increase in the number of elderly persons. However, the increase was accompanied by an increase in the prevalence of selected chronic diseases. Furthermore, the study found that age, sex, marital status, educational level, disability status, household composition and province of residence were statistically associated with being diagnosed with the selected chronic conditions among elderly persons in South Africa. Additionally, females and elderly people of higher ages who obtained lower levels of education and not married had a higher prevalence and were more likely to be diagnosed with the selected chronic conditions. Therefore, the study findings shows that there is a need for successful ageing and to develop prevention strategies in the management of the selected chronic conditions.

5.4 Recommendations

The study findings are beneficial to the health system, policymakers, and all stakeholders in the health sector. The study provides useful information on the key associations between selected chronic diseases and elderly persons. The government should devise a campaign drive to inform the elderly population about the influencing risk factors of the selected chronic diseases and how to control them, as well as to develop a national surveillance system for the selected chronic diseases and integration of the care of chronic diseases and their risk factors. Improvement of the socio-economic status of elderly persons is essential to the reduction of chronic diseases which will lead to successful ageing. The Department of Health should put in place policies that will guide decisions and plans aimed at promoting the health and well-being of the elderly population.

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APPENDICES

Figure A1: Ethics approval letter

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Senate Committee for Research Ethics
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17 August 2021

ETHICS APPROVAL LETTER OF STUDY

Based on approval by the **Basic and Social Sciences Research Ethics Committee (BaSSREC)** on 17/08/2021, the Basic and Social Sciences Research Ethics Committee hereby **approves** your study as indicated below. This implies that the North-West University Senate Committee for Research Ethics (NWU-SERC) grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the study may be initiated, using the ethics number below.

Study title: Determinants of selected chronic diseases among the elderly population of South Africa.

Study Leader/Supervisor (Principal Investigator)/Researcher: Dr M. Tsawe.

Student/Research Team: M.D. Temane (26595583).

Ethics number:

N	W	U	-	0	0	6	9	5	-	2	1	-	A	7
Institution				Study Number						Year			Status	

Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Application Type: Single Study

Commencement date: 17/08/2021 **Risk: No Risk**

Expiry date: 17/08/2022

Approval of the study is initially provided for a year, after which continuation of the study is dependent on receipt and review of the annual (or as otherwise stipulated) monitoring report and the concomitant issuing of a letter of continuation.

Special in process conditions of the research for approval (if applicable):

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, the following general terms and conditions will apply:

- *The study leader/supervisor (principle investigator)/researcher must report in the prescribed format to the BaSSREC:*
  - *annually (or as otherwise requested) on the monitoring of the study, whereby a letter of continuation will be provided, and upon completion of the study; and*
  - *without any delay in case of any adverse event or incident (or any matter that interrupts sound ethical principles) during the course of the study.*
- *The approval applies strictly to the proposal as stipulated in the application form. Should any amendments to the proposal be deemed necessary during the course of the study, the study leader/researcher must apply for approval of these amendments at the BaSSREC, prior to implementation. Should there be any deviations from the study proposal without the necessary approval of such amendments, the ethics approval is immediately and automatically forfeited.*
- *Annually a number of studies may be randomly selected for an external audit.*
- *The date of approval indicates the first date that the study may be started.*
- *In the interest of ethical responsibility, the NWU-SCRE and BaSSREC reserves the right to:*

- request access to any information or data at any time during the course or after completion of the study;
- to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process;
- withdraw or postpone approval if:
  - any unethical principles or practices of the study are revealed or suspected;
  - it becomes apparent that any relevant information was withheld from the BaSSREC or that information has been false or misrepresented;
  - submission of the annual (or otherwise stipulated) monitoring report, the required amendments, or reporting of adverse events or incidents was not done in a timely manner and accurately; and / or
  - new institutional rules, national legislation or international conventions deem it necessary.

- *BaSSREC can be contacted for further information or any report templates via 21081719@nwu.ac.za / 13128388@nwu.ac.za.*

The BaSSREC would like to remain at your service as scientist and researcher, and wishes you well with your study. Please do not hesitate to contact the BaSSREC or the NWU-SCRE for any further enquiries or requests for assistance.

Yours sincerely

Prof Jacques Rothmann

Chairperson NWU Basic and Social Sciences Research Ethics Committee

Original details: (22351930) C:\Users\22351930\Desktop\ETHICS APPROVAL LETTER OF STUDY.docm
8 November 2018

File reference: 9.1.5.4.2