HEALTHCARE UTILISATION IN URBAN AND RURAL AREAS IN LESOTHO

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DECLARATION BY STUDENT

I hereby declare that the data presented in this Dissertation report entitled, "Healthcare Utilisation in Urban versus Rural Areas in Lesotho" is based on the results of investigations carried out by me in the MA Economics at the Goa Business School Goa University under the Supervision of Assistant Professor Avina Kavthankar and Professor (Dr) Pranab Mukhopadhyay the same has not been submitted elsewhere for the award of a degree or diploma by me. Further, I understand that Goa University or its authorities will not be responsible for the correctness of observations / experimental or other findings given the dissertation.

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COMPLETION CERTIFICATE

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PREFACE

Health is a basic human right, but many people in Lesotho, especially those in rural areas, struggle to access adequate healthcare services. This study, titled "Healthcare Utilization in Urban Versus Rural Areas in Lesotho," aims to examine the differences and trends in healthcare utilization between urban and rural communities in the Kingdom of Lesotho. The study used data from the 2009 and 2014 Lesotho Demographic and Health Surveys.

The kingdom of Lesotho is known for its beautiful landscapes and rich cultural heritage. However, the healthcare sector faces persistent challenges that pose a threat to the well-being of the population. Despite economic progress, Lesotho continues to grapple with high rates of maternal and child mortality, as well as an increasing burden of non-communicable diseases such as HIV/AIDS, tuberculosis, diabetes, and hypertension.

The disparities in healthcare infrastructure between urban and rural areas worsen these challenges. Urban centres generally have better access to healthcare facilities and services, while rural communities suffer from a severe shortage of medical resources, including essential equipment, laboratories, and even electricity. Additionally, poverty is widespread in rural areas, limiting income opportunities and access to basic services, creating a cycle of health inequity.

To achieve universal healthcare in Lesotho, it is crucial to address these disparities and ensure that all individuals, regardless of their location or socioeconomic status, have equitable access to essential healthcare services.

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ABBREVIATIONS USED

Entity	Abbreviation
Antenatal care	ANC
Average Marginal Effects	AME
Electronic Health Records	HER
Christian Health Association of Lesotho	CHAL
Lesotho Demographic and Health Survey	LDHS
Mobile Health	MHealth
Health Information and Communication Technology	ICT
Postnatal care	PNC

ABSTRACT

This study aims to analyze healthcare utilization patterns in Lesotho, specifically in urban and rural areas. The primary focus is to assess the disparities in healthcare utilization between these areas and to identify any changes in healthcare patterns between 2009 and 2014. By utilizing data from the Lesotho Demographic and Health Surveys, the study explores the factors that affect access to and utilization of healthcare services. Additionally, the study assesses the potential influence of these factors on changes in healthcare utilization between 2009 and 2014.

The findings indicate that longer travel distances to healthcare facilities are associated with lower healthcare utilization, particularly in rural areas. While the wealth index does not show statistical significance, middle- and higher-income households demonstrate higher rates of healthcare service usage. Surprisingly, there is a negative correlation between health insurance coverage and healthcare visits, suggesting limitations in Lesotho's health insurance system. Age also emerges as a significant factor, with older age groups demonstrating lower rates of healthcare utilization. Despite challenges such as outdated data and gender-specific analyses, the study recommends the development of infrastructure in rural areas and a critical evaluation of health insurance schemes to address healthcare disparities in Lesotho.

KEYWORDS: **Healthcare, Urban versus Rural, Lesotho, Health Utilization**

CHAPTER 1: INTRODUCTION

1.1 Background of the study

Lesotho, a landlocked country surrounded by South Africa, is known for its mountainous landscape. With a total land area of 30,355 km2 and a population of around 2.3 million, the country's economy relies on subsistence agriculture, manufacturing, and labour export to South Africa (Koto & Maharaj, 2016).

Despite recent economic progress, health outcomes remain poor in Lesotho, with high rates of maternal and child mortality, as well as a growing burden of non-communicable diseases such as HIV/AIDS, TB, diabetes, and hypertension. According to the World Health Organization (WHO), in 2020, child mortality accounted for 54 deaths per 1,000 live births, while maternal mortality was 339 deaths per 100,000 live births. Lesotho also faces other challenges, including a high prevalence of HIV/AIDS (23.2%) and tuberculosis, as well as a lack of key infrastructure, as reported by the World Bank in 2023.

Rural areas in Lesotho experience a severe shortage of healthcare infrastructure, including proper medical equipment, laboratories, and electricity. Additionally, poverty is concentrated in rural areas, where income opportunities are limited, access to basic services and infrastructure is low, and vulnerability to environmental and economic shocks is high, according to the World Bank in 2023. This has resulted in the majority of the population living below the poverty line. As of 2022, Lesotho's Human Development Index (HDI) value was 0.521, positioning it at 168th out of 193 countries and territories, according to the World Bank. Meanwhile, life expectancy at birth has improved from 47.8 years in 2000 to 53.26 years in 2020.

Although there have been notable improvements in the past decade, the majority of health indicators in Lesotho still lag behind the sub-Saharan Africa averages and fall short of the targets set by the Sustainable Development Goals. Despite the aim to achieve universal healthcare by 2030, Lesotho struggles to meet this goal. For example, the ratio of doctors to the population is 0.9 per 10,000, and for nurse-midwives, the ratio is 10.2 per 10,000. Both ratios are below the WHO AFRO regional average of 2.6 and 12.0, respectively (World Bank, 2018). These low ratios significantly impact healthcare delivery and utilization. Addressing these issues, particularly the disparities between urban and rural areas is crucial for Lesotho to achieve universal healthcare.

The healthcare sector in Lesotho is divided among the government, CHAL (Christian Health Association of Lesotho), and private health institutions (Khiba, 2018). Health services are classified into three levels: primary, secondary, and tertiary care. Lesotho has a total of 376 health facilities, including 1 referral hospital, 2 specialized hospitals, 18 district hospitals, 3 filter clinics, and 302 health centers. The Ministry of Health owns 42 percent of health centers and 58 percent of hospitals, while the Christian Health Association of Lesotho owns 38 percent of health centers and 38 percent of hospitals. The rest of the facilities are either privately owned or operated by the Lesotho Red Cross Society (UNICEF, 2019/2020).

Healthcare utilization: Healthcare utilization refers to the use or consumption of healthcare services, procedures, devices, or pharmaceutical drugs to maintain and improve one's health. It can also encompass the prevention and treatment of health problems, as well as obtaining information about one's health status and prognosis (Fisher, 2019).

Urban and rural areas: The DHS program classifies urban areas into large cities (capital cities and cities with over 1 million population), small cities (population over 50,000), and towns (other urban areas), and all rural areas are assumed to be the countryside.

1.2 Objectives

The objectives of the study are:

a. To assess and analyze the level of disparities available in the rural-urban health care system in Lesotho
b. To analyze trends and changes in healthcare utilization between 2009 and 2014.

1.3 Hypotheses

This study has two hypothesizes:

a. H0a: There is no significant difference in the level of disparities between rural and urban healthcare utilization in Lesotho

   H1a: There is a significant difference in the level of disparities between rural and urban healthcare utilization in Lesotho

b. H0b: There is no significant change in Lesotho's healthcare utilization between 2009 and 2014

   H1b: There is a significant change in Lesotho's healthcare delivery between 2009 and 2014

1.4 Research questions

The research questions are as follows:

a. How does healthcare accessibility differ between Lesotho's rural and urban areas?
b. Has there been any changes in Lesotho’s healthcare system between 2009 and 2014?

1.5 Scope of the study

This study compares healthcare utilization between urban and rural areas in Lesotho, with a specific focus on the years 2009 and 2014. The analysis is limited to the available data and does not include other periods. Furthermore, the study specifically targets women aged 15-49 years, as previous research has shown that women tend to use healthcare services more often. Although this study does not provide formal policy recommendations, it serves as an initial academic exploration.

1.6 The Research Problem

In Lesotho, the majority of people face significant challenges in accessing affordable healthcare services, particularly in rural areas, despite substantial investments in the healthcare sector. Limited access and unaffordable health services, continue to hinder the population from utilizing healthcare. There is a need for this issue to be addressed for Lesotho to achieve universal healthcare.

1.7 The Research Gap

The study of healthcare utilization in urban versus rural areas has been conducted in different countries across the world. For example, in Ethiopia, Begashaw and Tesfaye (2016) examined Healthcare Utilization among Urban and Rural Households in the Esera District. Similarly, in China, Guo et al. (2020) explored Inequality in Health Service Utilization between rural and urban areas. However, there have been no similar investigations conducted in Lesotho.

The previous studies in Lesotho have examined various aspects of healthcare utilization such as knowledge, attitudes, and factors associated with tuberculosis (Luba et al., 2014); Clinical

breast Examination uptake among women of reproductive age (Afaya et al., 2014); Experiences of Health promotion activities by community health workers (Seutloali et al., 2018); and socioeconomic inequalities in HIV/AIDS prevalence (Hajizadeh et al., 2014), none of them have specifically investigated the disparities in overall healthcare utilization between urban and rural areas in Lesotho. Therefore, there is a need for comprehensive research to understand the impact of inaccessible and unaffordable healthcare services on healthcare utilization between rural and urban areas in Lesotho.

1.8 Significance Of the Study

This study is important because it provides an understanding and quantification of the drivers and magnitude of healthcare inequalities in urban-rural settings. It also identifies areas where resources are inadequately distributed. Additionally, it contributes to the body of academic knowledge in the field of Health Economics serving as a foundation for future academic discussions and allowing researchers and students to build upon my findings.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Healthcare utilization is influenced by a wide range of factors that extend beyond health and illness. These factors include sociodemographic characteristics, culture, geography, economics, personality, perceptions, access to services, attitudes and beliefs, and social roles. These factors have a significant impact on individuals' decisions to seek healthcare, the type and extent of services they use, and the outcomes of health-related services (Fisher, 2019).

2.2 Review of Related Literature

a. Geographic Accessibility and Healthcare Utilization

The Geographic Accessibility Model (Guagliardo, 2004) emphasizes that travel time and distance are important factors in determining healthcare-seeking behavior. Tanser et al. (2006) examined travel times to healthcare facilities in rural South Africa and their impact on healthcare utilization patterns. The findings revealed that individuals living in areas with longer travel times to healthcare facilities were less likely to seek healthcare promptly, resulting in delays in accessing medical care and poorer health outcomes in rural communities.

Furthermore, research in India has provided empirical evidence highlighting the importance of geographic accessibility in healthcare utilization. A study by Arokiasamy et al. (2014) investigated the influence of travel distance to healthcare facilities on healthcare-seeking behavior among rural populations in India. The study found that longer travel distances to healthcare facilities were associated with lower rates of healthcare utilization,

especially for preventive and primary care services. This underscores the need to enhance geographic accessibility to improve healthcare access in rural areas.

b. Socioeconomic Factors and Healthcare Access

Socioeconomic status (SES) plays a crucial role in determining access to and utilization of healthcare services, as suggested by the Social Determinants of Health framework (Marmot et al., 2008). People with higher socioeconomic status tend to use healthcare services more frequently (Gulliford et al., 2002). Factors such as education, income, and occupation affect individuals' ability to afford healthcare expenses. In a study on Difficulties facing healthcare workers in the era of AIDS treatment in Lesotho (Koto & Maharaj, 2016), the association between socioeconomic status and healthcare-seeking behavior was examined. The findings indicated that individuals from lower socioeconomic backgrounds encountered significant obstacles in accessing healthcare services, including financial constraints and limited availability of healthcare services.

Similarly, Schofield-Robinson et al. (2018) conducted a study in the United Kingdom to investigate the impact of socioeconomic status on healthcare. The results revealed that individuals with higher socioeconomic status were more likely to promptly access healthcare services, highlighting the influence of socioeconomic factors on patterns of healthcare utilization.

c. Health Belief Model and Healthcare Utilization

The Health Belief Model (Rosenstock, 1974) posits that an individual's health-seeking behavior is influenced by their beliefs of susceptibility to illness, the severity of the illness, the perceived benefits of preventive actions, and barriers to accessing healthcare. Research by Rahman et al. (2017) investigated how perceived benefits of preventive actions influenced healthcare utilization among Bangladeshi populations. The findings revealed that individuals who

perceived greater benefits from preventive healthcare measures were more likely to utilize healthcare services, supporting the principles of the Health Belief Model in predicting healthcare utilization in Bangladesh.

In Lesotho, Matekane et al. (2016) conducted a study on HIV/AIDS awareness and healthcare among men in Lesotho. The findings revealed that men from wealthier socioeconomic backgrounds were found to have higher HIV prevalence rates, suggesting that perceptions of susceptibility and severity may vary across different socioeconomic groups, influencing healthcare utilization patterns related to HIV/AIDS.

d. Healthcare Infrastructure and Service Availability

The Health Services Utilization Model (Andersen & Newman, 1973) suggests that the availability of healthcare services, such as primary care facilities and specialized hospitals, influences individuals' likelihood of seeking medical care. A study conducted by Huerta & Källestål, (2012) examined the connection between the availability of healthcare facilities and healthcare-seeking behavior in Rwanda. The findings indicated that disparities in healthcare infrastructure, particularly between urban and rural areas, affected patterns of healthcare utilization.

Brenner et al. (2014) also investigated the availability of healthcare facilities and their impact on healthcare use among the population of Malawi. The findings revealed that discrepancies in the accessibility of healthcare infrastructure, including shortages of medical staff and equipment, contributed to disparities in healthcare utilization rates betweenurban and rural areas. This study emphasized the need to enhance healthcare infrastructure to address the discrepancies in healthcare access in Malawi.

e. Andersen's Behavioral Model and Healthcare Services

According to Andersen's Behavioral Model of Health Services Use (1995), individual healthcare utilization is influenced by predisposing, enabling, and need factors. Limited access to healthcare facilities due to geographic isolation and transportation barriers serves as a significant predisposing factor in rural areas. This aligns with the concept of the Rural Health Disparity Model (Probst et al., 2007), which emphasizes the impact of geographic isolation and resource scarcity on healthcare access and utilization.

A study by McGrail et al. (2017) examined the impact of geographic isolation on healthcare utilization among rural Australians. The findings showed that geographic barriers, such as distance to healthcare facilities, contributed to disparities in healthcare utilization, supporting the principles of the Rural Health Disparity Model. Similarly, Zhang et al. (2018) investigated the impact of geographic isolation on healthcare among rural Chinese populations. The results revealed that geographical barriers, such as distance to healthcare facilities, were significant determinants of healthcare utilization, further supporting the principles of the Rural Health Disparity Model.

f. Gender Disparities in Healthcare Utilization

The Theory of Gender and Power proposed by Connell (1987), offers insights into the dynamics of gender disparities in healthcare utilization. This theory posits that gender differences in power relations within society influence access to resources, including healthcare. Empirical evidence suggests gender disparities in healthcare utilization, with women often accessing healthcare services more frequently than men (Gage & Guirlène Calixte., 2006). Factors such as reproductive health needs, maternal and child healthcare, and preventive services contribute to higher healthcare utilization rates among women.

A study by Doyal (2000), conducted in South Africa has illustrated how gender inequalities, exacerbated by norms and economic disparities, result in differential healthcare utilization patterns, with women facing greater barriers to accessing essential healthcare services compared to men. Additionally, a study by Nanda (2002), investigated the factors contributing to gender differences in healthcare utilization among African populations. The findings revealed that societal norms and cultural expectations often restrict women's access to healthcare services, particularly in rural areas.

g. Health Information and Communication Technologies (ICTs)

Health Information and Communication Technologies (ICTs), including telemedicine, mobile health (mHealth), and electronic health records (EHRs), have the potential to improve healthcare access, especially in remote and underserved areas (Michael et al., 2010). In 2024, Hadian conducted research on the impact of telemedicine services on healthcare among Indian populations. The study found that telemedicine interventions improved access to specialty care, particularly in remote and underserved areas, resulting in increased rates of healthcare utilization.

Liaw et al. (2013) conducted a study to explore the influence of EHR adoption on healthcare use among Australian populations. The findings revealed that implementing EHRs led to improved care coordination, reduced duplication of services, increased patient engagement, and higher rates of healthcare utilization. Furthermore, Lester et al. (2010) evaluated the effectiveness of mHealth applications in enhancing healthcare access and utilization among Kenyan populations. The findings indicated that mHealth interventions,such as SMS reminders and health education messages, contributed to increased healthcare utilization and improved health outcomes.

h. Cultural Beliefs and Healthcare Utilization

Schwitters et al. (2022) explored population-based survey research in Lesotho, revealing the significant impact of cultural beliefs on healthcare utilization related to HIV/AIDS. The study found that in Lesotho, many people opt for traditional healers or community-based support groups for HIV-related care due to the stigma associated with formal healthcare settings. Similarly, Doctor et al. (2013) conducted a study in Nigeria, demonstrating how deeply ingrained cultural practices, such as home births attended by traditional birth attendants, affect women's utilization of formal healthcare services for childbirth and prenatal care in many communities of Nigeria.

i. Health Education and Awareness Campaigns

Health education interventions, such as community workshops and mass media campaigns, can increase awareness of healthcare services and encourage their use. In a study conducted by Kim et al. (2023) in Australia, they examined the impact of mass media campaigns on smoking behaviors. The results showed that targeted health education initiatives, such as television advertisements and public awareness campaigns, raised awareness about the health risks associated with smoking and motivated smokers to seek support to quit, resulting in decreased smoking prevalence rates.

Umubyeyi et al. (2016) assessed the effectiveness of community-based health education interventions in promoting the utilization of maternal and child health services in rural Rwanda. The study found that health education programs led by the community, delivered through local health centers and community health workers, significantly increased awareness of maternal and child healthcare services and encouraged their use among rural populations.

j. Out-of-pocket expenditure and healthcare utilization

Out-of-pocket expenditure refers to individuals directly paying for healthcare services. This often leads to disparities in healthcare utilization, especially in rural areas with limited financial resources (Wagstaff et al., 2008). These financial barriers hinder access to healthcare services, particularly in rural areas with limited resources (McIntyre et al., 2006).

A study conducted by Wagstaff et al. (2008) in countries such as India and Bangladesh revealed lower healthcare utilization rates in rural areas due to out-of-pocket expenditures. In Sub-Saharan African countries, out-of-pocket payments are the primary means of financing healthcare, resulting in disparities in healthcare utilization. Research by Chuma et al. (2012) in Kenya found that high out-of-pocket expenditures were associated with reduced healthcare utilization, particularly among low-income households.

k. Health Insurance and Healthcare Utilization

The presence of health insurance has been linked to higher healthcare usage because it provides financial protection and reduces out-of-pocket expenses for healthcare services (Leive, 2008). In India, a study by Gupta et al. (2000) found that enrolling in health insurance programs was associated with increased healthcare utilization, especially among vulnerable populations. However, disparities still exist, as rural areas have lower utilization rates compared to urban areas (Rao et al., 2020). In Ghana, where a significant portion of the population lacks health insurance coverage, particularly in rural areas, the absence of financial risk protection discourages individuals from seeking timely medical care, especially for non-emergency conditions (Vellekoop, 2022).

l. Urban-Rural Healthcare Utilization Patterns

Empirical studies conducted in sub-Saharan African countries consistently show disparities in healthcare utilization between urban and rural populations. For instance, in a study conducted by Dewau et al. (2021) in East Africa, it was revealed that urban residents tend to use healthcare services more frequently than their rural counterparts. This difference in utilization rates is attributed to better accessibility to healthcare facilities and higher socioeconomic status among urban dwellers.

Similarly, a study conducted in Nigeria by Adeyanju et al. (2017), has also demonstrated urban-rural differences in healthcare utilization. They found that urban residents have higher rates of healthcare utilization compared to rural residents. Factors contributing to this discrepancy include the concentration of healthcare infrastructure in urban areas, greater availability of healthcare professionals, and higher levels of health awareness and education among urban populations.

m. Quality of Care and Patient Satisfaction

Multiple empirical studies have demonstrated that patients' perceptions of healthcare quality, such as provider communication, facility cleanliness, and waiting times, have a significant influence on their likelihood of seeking care and returning for follow-up visits (Crow et al., 2002). In the UK, Doyle et al. (2013) conducted studies to examine how patient experiences, including communication with healthcare providers and care coordination, affect healthcare utilization. The results indicated that positive patient experiences were linked to higher healthcare utilization and adherence to treatment plans, emphasizing the crucial role of patient-centered care in enhancing healthcare outcomes.

n. Distance and Transport in Healthcare Utilization

Insufficient transportation options and inadequate road infrastructure contribute to delays in accessing medical care, which worsen health outcomes and disparities in healthcare utilization (Onwujekwe, 2005). A study conducted by Tanser et al. (2006) in South Africa examined the relationship between distance to healthcare facilities and healthcare-seeking behavior among rural populations. The research revealed that long travel distances and limited transportation options posed significant obstacles to accessing healthcare services, resulting in delayed care-seeking and poorer health outcomes for rural residents.

Similarly, Rasella et al. (2014) investigated the link between distance to healthcare facilities and healthcare utilization patterns among individuals residing in remote regions of Brazil. The study found that lengthy travel distances and limited transportation options greatly impeded individuals' ability to seek timely medical care, leading to disparities in healthcare utilization and health outcomes in remote areas.

o. Health Facility Investments

Investments in health facility infrastructure, such as the construction and renovation of clinics and hospitals, have been proven to enhance healthcare access and usage, especially in rural areas (Lassi et al., 2013). In a study conducted by Teklegiorgis et al. (2018), the effectiveness of infrastructure improvements in promoting healthcare-seeking behavior in Ethiopian communities was assessed. The findings indicated that investments in expanding and upgrading health facilities led to higher rates of healthcare utilization, particularly in rural areas. Additionally, a study by Bhutta et al. (2008) revealed that the availability of well-equipped and easily accessible health facilities is linked to an increase in healthcare use and patient satisfaction.

p. Health System Factors and Healthcare

In addition to personal factors, healthcare utilization is affected by various factors related to the healthcare system, including the availability, accessibility, affordability, and quality of healthcare services (Andersen, 1995). A study carried out in South Africa thoroughly examined the influence of these health system factors on healthcare utilization. Moshabela et al. (2012) specifically investigated how healthcare accessibility and quality impact the behaviour of South African populations when seeking healthcare. The study emphasized the disparities in healthcare infrastructure and service provision between urban and rural areas, which had a significant impact on access to and utilization of healthcare services.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This section outlines the methods employed in investigating healthcare utilization patterns in Lesotho. It is consisting of the type of data used, variable definition and measurement, and statistical analysis and models used to explore the factors influencing healthcare access.

3.2 Data

This study utilized secondary data from the 2009 and 2014 Lesotho Demographic and Health Surveys (LDHS), which were obtained from https://dhsprogram.com/Data/. The LDHS surveys, conducted in collaboration with the worldwide Demographic and Health Surveys Program, aimed to provide current estimates for key demographic and health indicators, such as fertility and child mortality rates, maternal mortality, women's and children's nutrition, and attitudes and behaviors related to HIV/AIDS.

Both these surveys followed a two-stage sample design. In the first stage, clusters (sample points) were selected in both urban and rural areas. In the second stage, households were selected systematically. A total of 6,621 women were successfully interviewed in 2014, while 7,624 women were interviewed in 2009.

3.3 Variable Definition and Measurement

3.3.1 Outcome variables

The dependent variable, healthcare utilization, is measured using indicators such as healthcare visits in the last 12 months, health worker visits, Postnatal Care services, and Antenatal care

visits. These indicators were chosen because they are relevant for assessing the accessibility and usage of healthcare services. Additionally, they are key components of healthcare utilization among women. These four indicators are discussed in detail below:

a. Healthcare visits

The data for calculating the healthcare visits was obtained from the survey where the respondent was asked whether they had visited the healthcare facility for any reason in the last 12 months preceding the interview. This is a binary variable coded 1 if the individual did visit the healthcare facility and 0 otherwise.

b. Health worker visits

This variable indicates whether a respondent received a visit from a family planning worker in the twelve months preceding the interview. It is coded as "no" if the respondent did not receive a visit, and "yes" if they were visited by a family planning worker.

c. Antenatal care visits

Antenatal care measures the number of visits a pregnant woman has with skilled healthcare providers, such as doctors, midwives, nurses, and other trained health workers. The survey asked the respondent if she received antenatal care for her current pregnancy and, if so, how many times. A code of 0 was given to women who did not receive any antenatal care. The World Health Organization (WHO) recommends a minimum of four antenatal visits to reduce perinatal mortality and improve women's experience of care. In this study, the antenatal care variable is coded as binary with one 1 indicating four or more visits, and 0 indicating fewer than four visits. For this study, any number of visits less than four was considered equally risky as having no visits at all. It is important to note that although the minimum number of visits increased to eight in 2016, this data was collected before that policy was implemented.

d. Postnatal care visits

Postnatal care visits refer to the number of times a woman visits healthcare facilities for check-ups after giving birth. In this study, participants were asked whether they returned for baby check-ups 2 months after delivery. If they did, their response was coded as 1; otherwise, it was coded as 0.

3.3.2 Explanatory Variables

These variables refer to factors that influence healthcare utilization and are categorized into demographic, socioeconomic, and other factors. A more detailed discussion of each category is provided below**.**

a. Demographic characteristics

These variables provide fundamental information about the population under study, essentially describing the participants' key characteristics.

- **Age of the respondent:** This variable represents the current age of the respondents, ranging from 15-49 years. It has been further divided into four groups: 15-24, 25-34, 35-44, and 45-49.
- **Sex of the household head:** This indicates whether the respondent is male or female. It is coded as 1 for female and 0 for male.
- **Marital status:** This variable reflects the current marital status of the respondent. Initially, it consisted of six categories, but it has been regrouped into three outcomes: never married, married and divorced/widowed
- **Religion:** This variable initially had eleven categories but has been regrouped into non-Christian and Christian

- **Family size, Number of children and children under5:** This represents the total number of members in the household, total number of children ever born and total number of children under the age of five, respectively.

b. Socio-economic variables

These variables offer an understanding of the economic and educational backgrounds of individuals, which in turn provides insights about their social class.

- **Wealth index:** This index is already computed by DHS and uses information on the household's ownership of consumer items (such as telephone, motorcycle, and car), dwelling characteristics (such as flooring material), type of drinking water source, toilet facilities, and animal ownership. It is categorized into five categories: poorest, poor, middle, rich, and richest.
- **Educational Level:** This refers to the highest level of education attended by a household member. The options are: no education, primary, secondary, and higher.
- **Partner's Education:** Ever-married women were asked about their current or most recent partner's highest level of education. They were categorized into no education, primary, secondary, and higher.
- **Employment Status:** The respondent was asked whether they are currently working or have worked in the last 12 months.
- **Occupation:** If the respondent was working, they were asked about the type of job they mainly do. I further categorized this variable into agriculture and non-agriculture.
- **Health Insurance:** Individuals were asked if they have health insurance coverage. The response is coded as 1 if they have insurance, and 0 otherwise.

c. Geographic variables

Geographic variables describe how location influences healthcare utilization. They capture accessibility, resource availability, and potential disparities across regions.

- **Distance to health facilities:** If the respondent was sick, they were asked if distance was a barrier to seeking medical advice or treatment for themselves. The variable was coded as 0, indicating that distance was not a significant problem, and 1, indicating that it was a major problem.
- **Residence:** This refers to the type of place where the household is located, either urban or rural.

3.4 Statistical Model

A binary logistic regression model was used to determine whether independent variables could explain the differences in healthcare access for women in Lesotho, specifically between urban and rural areas. Binary logistic regression is employed when we want to estimate the probability of a dependent variable having only two outcomes. The choice of this model was appropriate for this study because the outcome variables are binary.

Equation 1. shows the general statistical form of the binary logistic regression model.

$$p(\boldsymbol{y}) = \frac{\mathbf{1}}{\mathbf{1}+\boldsymbol{e}^{-(\boldsymbol{\beta 0}+\boldsymbol{\beta 1 x 1}+\boldsymbol{\beta 2 x 2}+\boldsymbol{\varepsilon})}}$$

In equation 1, p(y) represents the probability of a specific category, which indicates the presence of a behavior or condition in the dependent variable, y. The βs are the coefficients of the independent variables, and x represents the independent variables themselves.

In this study, healthcare utilization in urban and rural areas, the binary logistic model is formulated as follows:

Equation 2.

$$p(y) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 demographic + \beta_2 socioeconomic + \beta_3 geographical)}}$$

Where:

Y represents the dependent variable, healthcare visits, ANC visits, or health worker visits, which is the likelihood of utilizing healthcare services. β0 is the intercept term. β1, β2 and β3 are the coefficients representing the impact of demographic characteristics, socio-economic variables, and geographical factors on healthcare utilization, respectively.

3.5 Statistical Analysis

The data from 2009 and 2014 were imported into STATA Version 12.0 and combined for processing, analysis, and visualization. The variables were carefully relabeled, recoded, and renamed to meet the assumptions of binary logistic regression. Descriptive statistics and two-way frequency tables were used to gain insights into the type of data and variables.

A logistic regression model was used to estimate the impact of healthcare visits, health worker visits, and antenatal care visits. Urban and rural variables were created, with urban set to 0 and rural set to 1, in order to determine if disparities existed between urban and rural areas in 2009 and 2014. Another variable, 'rounds', was created to represent the year of the survey. Another model was estimated, including interaction terms for each independent variable, to predict healthcare utilization for each dependent variable. The 'rounds' variable represented round=1

for the year 2009 and round=2 for the year 2014. This allowed for predicting changes in healthcare service utilization between the two time periods.

Using the model with interaction terms, significant categories of the independent variables and their corresponding odds ratios were identified. These predictors provided insights into the factors associated with healthcare utilization in Lesotho. Finally, average marginal effects (AME) were estimated for round=1 (2009) and round=2 (2014). Marginal effects represent the discrete change in the probability of healthcare utilization with a one-unit change in each independent variable. The analysis was conducted at a 5% significance level.

CHAPTER 4: RESULTS AND INTERPRETATION

4.1 Introduction

Chapter 4 presents the findings of a binary logistic regression analysis conducted to examine the likelihood of individuals in using healthcare services in Lesotho, both in urban and rural areas, from 2009 to 2014. It investigates how demographic, socioeconomic, and geographical factors influence healthcare utilization, using healthcare visits as a proxy. The main goal of this chapter is to evaluate the disparities in healthcare utilization between urban and rural areas in Lesotho.

4.2 Healthcare Visits in 2009 and 2014 in Lesotho

This section presents the regression results of healthcare visits on different Demographic, Socioeconomic, and Geographical Factors in both urban and rural areas of Lesotho in 2009 and 2014. It also provides an interpretation of the obtained results. It aims to determine whether there were any disparities in healthcare utilization between urban and rural areas of Lesotho in 2009 and 2014, addressing the first hypothesis of the study, which assumes that there are no disparities in the level of healthcare utilization between urban and rural areas of Lesotho.

4.2.1 Healthcare Visits in Urban Versus Rural Areas in Lesotho in 2009

Table 4.1

The likelihood of utilizing healthcare services in urban versus rural in 2009, N=7,532

	URBAN (n = 1,950)		RURAL (n = 5,582)	
Explanatory Variables	**Odds ratio**	**P-value**	**Odds ratio**	**P-value**
Sex				
male*(ref)*	1		1	
Female	1.086	.36	.875	.442
Current-age				
1~24*(ref)*	1		1	
25-34	1.164	*.096	.979	.903
35-44	1.021	.856	.688	*.068
45-49	.831	.204	.555	**.025
marital status				
unmarried*(ref)*	1		1	
married	1.012	.925	1.489	.102
Divorced/widowed	1.105	.511	.872	.563
Religion				
non-Cristian*(ref)*	1		1	
Christian	2.343	***.001	.575	.269
family size				
1-4 member *(ref)*	1		1	
5-10 members	1.103	.236	1.363	**.026
11-21 members	1.194	.218	1.859	.209
Children under5				
no children*(ref)*	1		1	
1-2children	1.082	.335	.935	.636
3-6children	.947	.73	.52	.262
Total children				
No children*(ref)*	1		1	
1-3 children	1.404	***.006	1.895	***.003
4-7 children	1.499	***.009	1.615	.108
8-12 children	2.52	***.002	3.214	.238
Occupation				
Non-Agri*(ref)*	1		1	
Agri	1.318	***.001	1.207	.152
Education				
no education*(ref)*	1		1	
Primary	1.743	**.025	1.568	.486
Secondary	1.92	**.011	1.836	.354
Higher	2.522	**.011	2.02	.302
Partner educ				
no education*(ref)*	1		1	
Primary	1.252	***.007	1.46	*.094
Secondary	1.338	***.012	1.153	.552
Higher	2.068	***.006	1.261	.447
wealth index				
poor *(ref)*	1		1	
Middle	.995	.955	1.183	.719
Rich	1.006	.951	.871	.743
health insurance				
no *(ref)*	1		1	
Yes	.609	***0	1.221	.216

Table4.1 continued.	1		1	
Distance				
not problem*(ref)*				
big problem	.929	.282	1.082	.672
no. of trips				
no trips	1			
			1	
less than 30trips	1.754	***0	1.416	***.006
30-60 trips	1.548	.108	1.322	.431

***p<.01, **p<.05, *p<.1

- In **table 4.1;**

a. Sex of the household

In urban areas, the odds ratio for females compared to males is 1.086 in urban areas, and in rural areas, it is 0.875. This means that females have slightly higher odds of utilizing healthcare services in urban areas compared to males. However, neither of these odds ratios is statistically significant (p-values of 0.36 and 0.442, respectively). Therefore, we can conclude that the sex of the household is not associated with healthcare visits in Lesotho's urban and rural areas.

b. Age of the respondent

In urban areas, individuals aged 25-34 have an odds ratio of 1.164, suggesting a greater likelihood of healthcare visits compared to the reference group (15-24 years). However, the p-value (0.096) does not reach conventional significance levels. In rural areas, individuals in the 35-44 and 45-49 age groups have odds ratios of 0.688 and 0.555, respectively, compared to the 15-24 age group. The odds ratio for the 45-49 age group has a significant p-value (p=0.025), indicating a decline in the probability of utilizing healthcare services among older age people in rural areas. Generally, there is a trend of decreasing odds of healthcare visits with age, with individuals aged 25-34 having a slightly higher odds (1.164 times) compared to those aged 1-24, although this is only marginally significant (p = 0.096).

c. Marital Status

In rural areas, individuals who are married have a higher likelihood of healthcare visits compared to those who have never been married. The odds ratio for this association is 1.489 ($p = 0.102$). However, marital status does not impact healthcare utilization between urban and rural areas. There is no significant association between marital status and healthcare visits in either urban or rural areas, as indicated by the p-values.

d. Religion

Christians have significantly higher odds of healthcare visits compared to non-Christians in urban areas, with an odds ratio of 2.343 and a highly significant p-value ($p < 0.001$). However, in rural areas, the odds ratio is lower (0.575), suggesting a reduced likelihood of healthcare visits for Christians compared to non-Christians, the p-value is not significant. This indicates that there is a statistically significant difference in Christians' utilization of health services between urban and rural areas.

e. Family Size and Total Children

Larger family sizes and higher numbers of children are associated with increased odds of healthcare visits. For example, having 11-21 family members is associated with an odds ratio of 1.859 ($p = 0.209$) compared to having 1-4 family members in rural areas but these associations are not significant.

In both urban and rural areas, the odds ratios for various categories on children under 5 years compared to no children generally indicate increased likelihoods of healthcare visits. For instance, in urban areas, individuals with 1-2 children who are under 5 years have an odds ratio of 1.082 compared to those with no children but is not significant. There more children (under5) there are in the family the less the probability of an individual utilising healthcare services in both urban and rural areas.

The higher the total number of children alive in the family, the higher the probability of visiting healthcare in both urban and rural areas. For example, in the urban areas, having 8-12 total children has odds ratio of 2.52 compared to having no children and 5 and this association is statistically significant (p = 0.002). Similar significant associations are observed for rural areas.

f. Occupation

Individuals engaged in agricultural occupations have significantly higher odds of healthcare visits compared to those in non-agricultural occupations in both urban and rural areas. This is evident from the odds ratios (1.318 in urban areas and 1.207 in rural areas) and the corresponding significant p-value (p = 0.001) in urban areas. The higher likelihood of utilizing health services in rural areas is not significant (p = 0.152).

g. Health Insurance

Surprisingly, individuals who are covered by health insurance have significantly lower odds of healthcare services compared to those without health insurance in urban areas, as indicated by the odds ratio of 0.609 and the significant p-value (p = 0). However, in rural areas, the association between health insurance and healthcare visits is not significant although the odds ratio (1.22) is higher.

h. Wealth Index

The wealth index does not consistently show significant associations with utilizing healthcare services in urban or rural areas at all the categories. The odds ratios for middle and rich wealth index categories compared to the poor reference category are higher, close to 1 in the urban, but the corresponding p-values are not significant.

i. Educational level and partner's education

Higher levels of education are associated with increased odds of healthcare visits in both urban and rural areas. For instance, individuals with higher education have significantly higher odds (OR=2.522) of healthcare visits compared to those with no education, and p-values associated with having education are significant in rural areas (p = 0.025, 0.011, 0.011). However, there is no significant association between health visits and education in rural areas.

Similar to individual education levels, higher levels of partner education are associated with increased odds of healthcare visits in both urban and rural areas, with significant associations observed for all the categories in urban areas (p-value = 0.07, 0.12, 0.06). However, in rural areas, only partners with primary education compared to the no education category have a p-value of 0.09.

j. Distance to Health Facility and number of trips:

The distance to health facilities does not significantly affect healthcare visits in urban or rural areas, as shown by the p-values. On the other hand, Individuals who make less than 30 trips to outside the country have a significantly higher likelihood of healthcare visits compared to those who make no trips, both in urban and rural areas. However, the odds ratios for making more than 30 trips are not consistently significant in urban and rural areas.

4.2.2 Healthcare Visits in Urban Versus Rural Areas of Lesotho in 2014

Table 4.2

The likelihood of utilizing healthcare services in urban versus rural areas of Lesotho in 2014, N=6,536

	UBARN (n= 2,165)		**RURAL (n= 4,371)**	
Explanatory variables	**Odds ratio**	**P-value**	**Odds Ratio**	**P-value**
Sex				
male*(ref)*	1		1	
Female	1.104	.407	.889	.501
Current-age				
1~24*(ref)*	1		1	
25-34	.881	.277	.919	.686
35-44	.714	***.017	.721	.151
45-49	.627	***.009	.791	.416
marital status				
never married*(ref)*	1		1	
Married	1.066	.711	.983	.945
Divorced/widowed	1.348	.117	.806	.36
Religion				
non-Cristian*(ref)*	1		1	
Christian	1.603	**.047	1.231	.619
family size				
1-4 member *(ref)*	1		1	
5-10 members	1.161	.115	.973	.857
11-21 members	.965	.868	.485	.218
Children under5				
no children*(ref)*	1		1	
1-2children	1.35	***.002	1.5	***.006
3-6children	1.542	*.076	3.581	*.064
Total children				
No children*(ref)*	1		1	
1-3 children	1.556	***.003	1.55	**.043
4-7 children	1.804	***.002	.954	.88
8-12 children	3.645	***.005	.211	**.029

Table4.2continued				
Occupation	1		1	
Non-Agri*(ref)*				
Agri	1.253	**.022	.726	.712
Education				
no education*(ref)*	1		1	
Primary	2.233	***.004	.788	.712
Secondary	2.632	***.001	.672	.542
Higher	1.865	*.098	.622	.484
Partner educ				
no education*(ref)*	1		1	
Primary	1.401	***.002	1.426	.172
Secondary	1.603	***.001	1.36	.252
Higher	1.735	*.057	1.208	.557
wealth index				
poor *(ref)*	1		1	
Middle	1.067	.561	1.563	0.27
Rich	.832	.128	1.104	.788
health insurance				
no *(ref)*	1		1	
Yes	2.265	.201	1.457	.268
Dist.Healthfacility				
not problem*(ref)*	1		1	
big problem	1.286	***.004	1.57	**.042
no. of trips				
no trips	1		1	
less than 30trips	1.798	**0	2.273	***0
30-60 trips	1.327	.244	1.804	.105

***p<.01, **p<.05, *p<.1, *Dist= Distance*

In **table 4.2:**

a. Sex, Marital Status, Wealth Index, Health Insurance:

There are no significant differences in healthcare utilization based on marital status, sex of the household, wealth index and health insurance in either urban or rural areas. However, the wealth index shows high odds of utilising Healthcare services by individuals from the middle

category in both urban and rural areas unlike in 2009. As for the health insurance, the odds of utilising healthcare services have also increased, OR = 2.225 which is twice that of 2009 (OR=1.22).

b. Current Age of the respondent

Older age groups (35-44 and 45-49) show significantly lower odds of healthcare visits compared to younger individuals (15-24), indicating reduced healthcare utilization among older age groups in urban, OR= 0.714. and 0.627, respectively. In the rural areas, the odds ratio also shows a decreasing trend but it is not significant. These indicates disparities in healthcare utilization across age groups in both urban and rural areas, and we reject the null hypothesis that there are no disparities in urban versus rural areas.

c. Religion

In urban areas, Christians have significantly higher odds (OR=1.603) of healthcare visits compared to non-Christians, whereas in rural areas, the difference is not statistically significant, supporting the null hypothesis for rural areas but rejecting it for urban areas.

d. Family size, children under5 and total number of children

The family size is not associated with utilising health services in both urban and rural areas, however the number of children an individual has as well as having children under the age of five are associated with higher significant odds of utilising health care services in both urban and rural areas. For instance, an individual having 1-2 children under the age of 5 has 1.35 times the odds of utilising healthcare services in the urban areas and 1.5 times in the rural areas compared to having no children. There is an increasing trend associated with the total number of children an individual has and healthcare visits, (OR= 1.556, 1.804, 3.645) in the urban

areas. However, in the rural areas there is a decreasing trend, (1.55, 0.954, 0.211). These differences are significant across all the categories.

e. Occupation

Individuals engaged in agricultural occupations have a significantly higher odds of healthcare visits in urban areas (OR=1.253) compared to non-agriculture rural areas. This may be because agricultural workers are more exposed to occupational hazards and may require medical attention more often. However, in the rural the likelihood of utilising health services is declining (OR= 0.726) though the decrease is not significant.

f. Educational level and partner's education

The levels of education (primary, secondary, and higher) are associated with significantly higher odds of healthcare visits compared to those with no education, particularly in urban areas (OR= 2.233, 2.632 1.865, respectively), indicating disparities based on education level. Similar to individual education levels, partner's education also shows a significant positive association with healthcare visits across the all the categories.

g. Distance to Health Facility and Number of Trips

Facing problems with the distance to health facilities significantly increases the odds of healthcare visits in both urban and rural areas, (OR=1.286, p=.004, OR=1.57, p=.04, respectively), suggesting disparities related to access to health services. Similarly, making fewer than 30 trips to outside the country significantly increases the odds of healthcare visits in both urban and rural areas, indicating disparities in healthcare utilization based on travel frequency.

4.3 Average Marginal Effects in Healthcare Visits between 2009 and 2014 in Lesotho

This section aims to determine the average marginal effects (AME) caused by changes in demographic, socioeconomic, and geographical variables that have influenced the likelihood of healthcare service utilization in 2009 and 2014. It interprets the results obtained and answer the second hypothesis, which examines whether any changes occurred in the healthcare system in Lesotho between 2009 and 2014.

Table 4.3

Average Marginal Effects in Healthcare Visits in association with various factors between 2009 and 2014

Dependent variable	Margins	P-value	95% CI LB	UB
Occupation(non-Agric)				
2009	0.059	0.000	0.027	0.091
2014	0.011	0.485	-0.019	0.040
Rounds (2009)				
_at				
2009	0.240	0.000	0.220	0.260
2014	0.240	0.000	0.220	0.260
health insurance (No)				
_at				
2009	-0.056	0.015	-0.101	-0.011
2014	0.067	0.169	-0.028	0.162
Distance (not problem)				
_at				
2009	-0.017	0.254	-0.047	0.012
2014	0.057	0.000	0.026	0.088
Sex head(female)				
_at				
2009	0.006	0.747	-0.031	0.043
2014	0.005	0.785	-0.032	0.042
Age (25-34)				
_at				
2009	0.025	0.190	-0.013	0.063
2014	-0.022	0.231	-0.058	0.014
Age (35-44)				
_at				
2009	-0.020	0.400	-0.067	0.027
2014	-0.064	0.005	-0.108	-0.019

***Table 4.3 continued*.**

Age (45-49)				
_at				
2009	-0.065	0.028	-0.123	-0.007
2014	-0.082	0.006	-0.141	-0.024
Marital status(married)				
_at				
2009	0.026	0.336	-0.027	0.079
2014	0.010	0.703	-0.042	0.062
Marital status(divorced/widow)				
_at				
2009	-0.002	0.953	-0.061	0.057
2014	0.015	0.580	-0.039	0.069
Religion(non-Christians)				
_at				
2009	0.133	0.004	0.043	0.224
2014	0.079	0.075	-0.008	0.166
Family size (5-10 members)				
_at				
2009	0.041	0.013	0.009	0.074
2014	0.017	0.265	-0.013	0.047
Family size (11-21 members)				
_at				
2009	0.060	0.063	-0.003	0.123
2014	-0.029	0.475	-0.108	0.050
child_under5(1-2 children)				
_at				
2009	0.014	0.400	-0.019	0.047
2014	0.064	0.000	0.033	0.095
child_under5(3-6 children)				
_at				
2009	-0.023	0.514	-0.093	0.047
2014	0.104	0.007	0.029	0.179
Tot children (1-2 children)				
_at				
2009	0.095	0.000	0.048	0.143
2014	0.091	0.001	0.039	0.142
tot children (3-7 children)				
_at				
2009	0.105	0.001	0.043	0.166
2014	0.096	0.003	0.032	0.160
Tot children (8-12 children)				
_at				
2009	0.230	0.000	0.105	0.355
2014	0.213	0.000	0.094	0.332
Education (primary)				
_at				
2009	0.125	0.011	0.028	0.223
2014	0.135	0.018	0.023	0.248
education (secondary)				
_at				
2009	0.156	0.003	0.055	0.257
2014	0.152	0.010	0.037	0.267

***Table 4.3 continued*.**

Education (higher)				
_at				
2009	0.184	0.004	0.059	0.308
2014	0.116	0.077	-0.013	0.246
Partner educ (no education)				
_at				
2009	0.057	0.002	0.021	0.093
2014	0.068	0.001	0.028	0.109
Partner educ (primary)				
_at				
2009	0.053	0.028	0.006	0.100
2014	0.088	0.000	0.040	0.135
Partner educ(secondary)				
_at				
2009	0.101	0.019	0.017	0.186
2014	0.076	0.040	0.004	0.148
Wealth index (middle)				
_at				
2009	0.003	0.870	-0.036	0.043
2014	0.026	0.172	-0.011	0.063
Wealth index(rich)				
_at				
2009	-0.007	0.730	-0.044	0.031
2014	-0.019	0.318	-0.057	0.019
Trips (no trips)				
_at				
2009	0.124	0.000	0.096	0.151
2014	0.125	0.000	0.098	0.153
Trips (<30 trips)				
_at				
2009	0.096	0.067	-0.007	0.198
2014	0.077	0.044	0.002	0.153

Note: dy/dx for factor levels is the discrete change from the base level.

In **Table 4.3**

a. Occupation

In 2009, for every one-unit increase in non-agricultural occupation, the probability of healthcare visits increased by approximately 5.92%. In 2014, this increase was smaller, around 1.1% and not significant.

b. Rounds

There was a consistent increase in the probability of utilising healthcare services with respect to the years of survey, with an average increase of approximately 24.04%.

c. Health Insurance

Individuals without health insurance experienced a statistically significant decrease in the probability of healthcare visits by approximately 5.56% in 2009 compared to 2014(6.7%). However, for 2014, the effect was not statistically significant.

d. Distance to Healthcare Facilities and number of trips

In 2014, individuals who reported distance was not a problem had a statistically significant increase in the probability of healthcare visits by approximately 6.7% compared to a -1.7 decrease in 2009. However, the effect in 2009 was not significant.

Each additional trip outside the country is associated with a statistically significant increase of 9.6% in the probability of healthcare visits in 2014, and a non-significant 7.7% in 2009.

e. Sex of Household Head

There has not been any statistically significant change in 2009 and 2014. Whether the responded was a male or female did not show effects on the probability of healthcare visits in both round 1 and round 2 although the number has gone in 2014 but it was not significant.

f. Age of the respond

The effect of age on healthcare visits was not significant for individuals aged 25-34 years although they experienced a decrease in healthcare visits by approximately 2.2% in 2014 compared to 2.5% decrease in 2009. Similarly, in individuals aged 35-44 years there is a 6.4% decrease in healthcare visits in 2014 as compared to 2% decrease in 2009. However, in individuals aged 44-49 years, there has been a significant decline from 6.5% in 2009 to 8.2% in 2014.

g. Marital Status

Marital status did not significantly affect healthcare utilisation in both unmarried and married categories in both years.

h. Religion

Non-Christian religions, such as Islam, were associated with a significant increase in the probability of healthcare utilization by approximately 13.34% in round 2009 compared to 7.7% in 2014.

i. Family Size, children Under 5, and total number of Children

Larger family size is associated with a significant increase of 6% in the probability that an individual utilises the healthcare services in 2009 but in 2014 it was a 2.6% decrease even though it was not significant. Having children under 5 significantly increased healthcare visits in 2014 by 10% (p-value=0.07) compared to a decline of 2.3% in 2009. Having more children significantly increased healthcare visits but the increase in 2014 was less compared to 2009 in all the categories.

j. Educational level and partner's education

At primary, secondary and higher levels of education, there has been a significant increase in the probability of utilising healthcare visits. However, at secondary and higher the change has gone down in 2014 (15.2%, 11.6%) compared to 2009 (15.6, 18.4%). This is similar to partners education which shows a less but positive change at secondary category in 2014.

k. Wealth Index

The wealth index did not significantly affect healthcare in both years but there has been a decline of 0.7% in 2009 compared to 1.9% in 2014 in the rich category.

4.4 Average Marginal Effects in Antenatal Care Services Between 2009 And 2014

This section tells whether there have been any changes caused by the disparities in the urban and rural areas in utilisation of healthcare services among pregnant women in Lesotho in 2009 and 2014, as they are also part of the people who utilises healthcare services.

Table 4.4
Average Marginal Effects in Antenatal care Visits in 2009 and 2014

Variables	dy/dx	Std.Err.	P>z	[95%Conf.	Interval]
Occupation (Agric)					
_at					
2009	-0.002	0.022	0.934	-0.044	0.041
2014	-0.006	0.021	0.795	-0.048	0.036
Rounds					
_at					
2009	0.043	0.013	0.001	0.017	0.069
2014	0.043	0.013	0.001	0.017	0.069
Health-insurance(no)					
_at					
2009	0.036	0.032	0.254	-0.026	0.098
2014	0.120	0.088	0.175	-0.053	0.292
Distance_is_problem					
_at					
2009	-0.002	0.018	0.895	-0.037	0.032
2014	0.009	0.020	0.646	-0.030	0.049
Sex-head(female)					
_at					
2009	-0.001	0.022	0.973	-0.044	0.043
2014	0.021	0.024	0.369	-0.025	0.068
Age (25-34)					
_at					
2009	0.044	0.021	0.036	0.003	0.085
2014	0.002	0.022	0.927	-0.042	0.046
Age (35-44)					
_at					
2009	0.058	0.031	0.066	-0.004	0.120
2014	0.072	0.031	0.018	0.012	0.132
Age (45-49)					
_at					
2009	0.038	0.062	0.544	-0.084	0.159
2014	-0.027	0.085	0.748	-0.195	0.140
marital-status (widow)					
_at					
2009	0.002	0.039	0.950	-0.074	0.079
2014	-0.112	0.049	0.022	-0.207	-0.016
Marital-status (divorced)					
_at					
2009	0.076	0.038	0.043	0.002	0.150
2014	-0.067	0.042	0.111	-0.150	0.016

Table 4.4 continued.

Religion (Christian)					
_at					
2009	0.024	0.056	0.671	-0.086	0.133
2014	0.140	0.060	0.019	0.023	0.257
Family size (5-10 members)					
_at					
2009	-0.035	0.021	0.097	-0.077	0.006
2014	-0.006	0.021	0.786	-0.046	0.035
Family size (11-21 members)					
_at					
2009	-0.017	0.036	0.628	-0.087	0.053
2014	-0.047	0.047	0.315	-0.140	0.045
child_under5(1-2 children)					
_at					
2009	-0.036	0.029	0.216	-0.092	0.021
2014	0.028	0.030	0.350	-0.030	0.086
child_under5(3-6 children)					
_at					
2009	-0.053	0.042	0.204	-0.135	0.029
2014	-0.017	0.050	0.734	-0.115	0.081
Total children (1-3 children)					
_at					
2009	0.102	0.069	0.138	-0.033	0.236
2014	-0.060	0.061	0.319	-0.179	0.058
Total children (4-7 children)					
_at					
2009	0.032	0.075	0.669	-0.115	0.179
2014	-0.102	0.068	0.133	-0.235	0.031
Total children (8-12 children)					
_at					
2009	-0.002	0.103	0.981	-0.204	0.199
2014	-0.169	0.115	0.141	-0.395	0.056
Education(primary)					
_at					
2009	-0.047	0.056	0.403	-0.156	0.063
2014	-0.048	0.073	0.511	-0.192	0.095
Education(secondary)					
_at					
2009	0.009	0.058	0.873	-0.105	0.124
2014	-0.039	0.075	0.607	-0.186	0.108
Education(higher)					
_at					
2009	0.090	0.078	0.248	-0.063	0.242
2014	-0.018	0.089	0.842	-0.192	0.156
Partner educ(primary)					
_at					
2009	0.002	0.022	0.941	-0.042	0.045
2014	-0.001	0.027	0.975	-0.054	0.053
Partner educ(secondary)					
_at					
2009	0.050	0.029	0.085	-0.007	0.108
2014	0.067	0.032	0.035	0.005	0.129
Partner educ(higher)					
_at					
2009	0.069	0.060	0.248	-0.048	0.187
2014	0.086	0.051	0.095	-0.015	0.186

Table 4.4 continued.

Wealth index(middle)					
_at					
2009	0.028	0.024	0.249	-0.020	0.075
2014	0.018	0.026	0.504	-0.034	0.069
Wealth index(rich)					
_at					
2009	0.090	0.024	0.000	0.043	0.136
2014	0.088	0.025	0.000	0.039	0.138
Trips (<30 trips)					
_at					
2009	0.041	0.017	0.017	0.007	0.075
2014	0.014	0.019	0.477	-0.024	0.051
Trips (30+ trips)					
_at					
2009	0.110	0.062	0.076	-0.011	0.231
2014	0.066	0.045	0.142	-0.022	0.154

Table 4.4 shows that:

a. Occupation

There is a slight change in Antenatal care utilization patterns associated with individuals whose jobs are classified as agricultural. Although the difference in probability between the two years is not statistically significant, there is a small decrease in ANC visits associated with occupation in 2014 compared to 2009, (dy/dx = -0.002 in 2009 vs. -0.006 in 2014).

b. Rounds

The probability of utilising antenatal care services showed a significant increase in both 2009 and 2014 (dy/dx = 0.043, $p < 0.001$). This highlights a consistent trend of increased ANC utilization across both time points, emphasizing the continued importance of ANC services over the years.

c. Age of the respondent

Age has varying effects on ANC utilization over time. Certain age groups (25-34 and 35-44) show statistically significant changes in ANC visits between 2009 and 2014 with the middle age showing a higher increase (7.2%) in 2014 compared to 2009(5.8%). In the older age, 44-

49, there is a decline in anc services from 2009 to 2014, even though it is not statistically significant (2014 dy/dx= -0.027, 0.038 in 2009).

d. Marital Status

Significant variations were found in the probability of ANC visits related to marital status between the two years. There is a statistically significant decrease in ANC utilization among widows in 2014 compared to 2009 (dy/dx=-0.112, p=0.022). Again, the association of the divorced individuals with the antenatal care services decreased significantly from dy/dx = 0.076 in 2009 to dy/dx= -0.067 in 2014

e. Sex of Household Head

There was no statistically significant change in ANC utilization associated with the sex of the household head between 2009 and 2014. This indicates that whether a person was male or female did not impact the utilisation of antenatal care visits by a pregnant woman statistically, but there has been a change over the years (dy/dx=-.001 in 2009 and 0.009 in 2014).

f. Religion

The probability of utilising anc services among individuals who are Christians has shown a significant increase in 2014 (dy/dx = 0.140, p = 0.019) compared to 2009 (dy/dx=0.024, p=0.671). Christians utilised antenatal services more in 2014 than in 2009.

g. Health Insurance

An increase in ANC visits among pregnant women with health insurance coverage is observed in 2014 (dy/dx = 0.120, p = 0.175) compared to 2009 (dy/dx = .036, p = 0.254), although it was not significant (p value=0.175). This suggests that access to health insurance may have

enhanced ANC utilization, indicating a positive trend in healthcare accessibility to pregnant mothers.

h. Family Size and Total Children

While family size and total children did not show statistically significant changes in ANC utilization between 2009 and 2014, the marginal effects suggest potential decline in the use of ANC services among families with more members (dy/dx= -0.035 in 2009, -0.006 in 2014) as well as in the families which have large number of children (dy/dx=-0.002 in 2009 and -0.169 in 2014). However, the utilisation of anc services in respondents with children under the age of 5 is seen to be increasing from 2009 to 2014 even though it is not is not statistically significant.

i. Wealth Index

A significant increase in ANC visits is observed among individuals with higher wealth index scores, that is the rich people, in 2014 (dy/dx = 0.088, $p < 0.001$), compared to 2009 (dy/dx = 0.090, $p < 0.001$). This suggests a positive correlation between socio-economic status and ANC utilization, indicating access in healthcare among wealthier households over time.

j. Trips and Distance is a Problem

While distance as a problem does not show statistically significant effects on ANC visits in 2014 compared to 2009. The marginal increase in probability suggests a potential improvement in accessibility to healthcare services despite geographical challenges (dy/dx = 0.009 in 2014, -0.002 in 2009). There has been a significant decrease in the utilisation of anc services by individuals who takes trips to visit outside the country in both years.

4.5 Average Marginal Effects in Health Worker Visits

This section examines changes in health worker visits to respondents between 2009 and 2014, focusing on demographic, socioeconomic, and geographical factors.

Table 4.5
Average Marginal Effects in Health worker visits in 2009 and 2014

Variables	dy/dx	Std.Err.	P>z	[95% Conf.	Interval]
occupation (Agric)					
_at					
2009	-0.004	0.007	0.556	-0.017	0.009
2014	-0.008	0.008	0.357	-0.024	0.008
Rounds					
_at					
2009	0.019	0.005	0.000	0.010	0.029
2014	0.019	0.005	0.000	0.010	0.029
Health-insurance(no)					
_at					
2009	0.007	0.010	0.515	-0.013	0.027
2014	0.007	0.027	0.802	-0.047	0.060
Distance_is_problem					
_at					
2009	-0.001	0.006	0.912	-0.013	0.012
2014	0.005	0.009	0.533	-0.011	0.022
Sex-head(female)					
_at					
2009	-0.000	0.008	1.000	-0.016	0.016
2014	0.002	0.011	0.867	-0.019	0.023
Age (25-34)					
_at					
2009	0.003	0.008	0.660	-0.012	0.018
2014	0.019	0.010	0.049	0.000	0.038
Age (35-44)					
_at					
2009	0.012	0.010	0.228	-0.008	0.032
2014	0.026	0.012	0.031	0.002	0.050
Age (45-49)					
_at					
2009	0.015	0.013	0.244	-0.010	0.041
2014	0.011	0.015	0.445	-0.018	0.041
marital-status (widow)					
_at					
2009	-0.005	0.011	0.620	-0.026	0.016
2014	-0.012	0.014	0.377	-0.039	0.015
Marital-status (divorced)					
_at					
2009	-0.015	0.011	0.160	-0.037	0.006
2014	-0.015	0.014	0.294	-0.042	0.013

Table 4.5 continued.

Religion (Christian)					
_at					
2009	-0.007	0.021	0.723	-0.048	0.033
2014	-0.004	0.024	0.858	-0.050	0.042
Family size (5-10 members)					
_at					
2009	-0.002	0.007	0.823	-0.015	0.012
2014	-0.004	0.009	0.641	-0.021	0.013
Family size (11-21 members)					
_at					
2009	0.016	0.016	0.300	-0.015	0.047
2014	-0.003	0.022	0.883	-0.046	0.040
child_under5(1-2 children)					
_at					
2009	-0.006	0.007	0.442	-0.020	0.009
2014	-0.002	0.009	0.795	-0.019	0.014
child_under5(3-6 children)					
_at					
2009	-0.013	0.013	0.343	-0.039	0.014
2014	0.004	0.024	0.860	-0.042	0.051
Total children (1-3 children)					
_at					
2009	0.008	0.009	0.380	-0.010	0.027
2014	0.022	0.011	0.053	-0.000	0.043
Total children (4-7 children)					
_at					
2009	0.019	0.013	0.145	-0.007	0.045
2014	0.048	0.017	0.004	0.015	0.081
Total children (8-12 children)					
_at					
2009	0.010	0.025	0.693	-0.040	0.060
2014	0.016	0.040	0.695	-0.063	0.095
Education(primary)					
_at					
2009	-0.019	0.022	0.370	-0.062	0.023
2014	0.012	0.025	0.634	-0.037	0.061
Education(secondary)					
_at					
2009	-0.005	0.023	0.822	-0.050	0.040
2014	0.014	0.026	0.590	-0.037	0.064
Education(higher)					
_at					
2009	0.011	0.031	0.717	-0.050	0.073
2014	0.041	0.032	0.199	-0.022	0.104
Partner educ(primary)					
_at					
2009	-0.005	0.008	0.537	-0.019	0.010
2014	0.001	0.011	0.946	-0.020	0.021
Partner educ(secondary)					
_at					
2009	0.006	0.011	0.607	-0.016	0.027
2014	0.005	0.013	0.679	-0.020	0.031
Partner educ(higher)					
_at					
2009	-0.004	0.017	0.810	-0.038	0.029
2014	0.020	0.022	0.367	-0.023	0.062

Table 4.5 continued.

Wealth index(middle)					
_at					
2009	-0.014	0.009	0.126	-0.033	0.004
2014	0.006	0.012	0.616	-0.017	0.029
Wealth index(rich)					
_at					
2009	-0.025	0.009	0.004	-0.042	-0.008
2014	-0.012	0.011	0.274	-0.032	0.009
Trips (<30 trips)					
_at					
2009	0.020	0.006	0.001	0.009	0.032
2014	0.009	0.008	0.258	-0.006	0.024
Trips (<30 trips)					
_at					
2009	0.044	0.028	0.122	-0.012	0.099
2014	0.035	0.025	0.162	-0.014	0.083

Note: dy/dx for factor levels is the discrete change from the base level.

In **table 4.5:**

a. Occupation

There is a slight decrease in the probability of health worker visits with respect to individual's whose job is agricultural but that change is not statistically significant, dy/dx= -0.004 in 2009 and -0.008 in 2014).

b. Health Insurance

Although having health insurance appears to have a positive effect on health worker visits dy/dx = 0.007 in both years, this effect is not statistically significant but it suggests a consistent influence of health insurance on health worker visits over time.

c. Distance as a Problem

In 2009 distance being a problem had a negative effect on the health worker visits (dy/dx = -0.001). But in 2014 there seems to be a slight positive effect (0.005) although is not statistically significant, indicating potential changes in accessibility to healthcare services with respect to health worker visits.

d. Sex of Household Head

Regardless of the sex of the household head, there's no significant change in the likelihood of health worker visits over time.

e. Age

While there's a minor effect of age on health worker visits in 2009, the influence becomes more pronounced and statistically significant in 2014 across the middle age groups. For example, there is a significant 1.9% increase in the health worker visits among the 35-44 age group in 2014 compared to 0.3% in 2009.

f. Marital Status

There is a decrease in the probability of health worker visits for individuals in certain marital status categories. For example, the probability of health worker visiting the widows in 2014 is -1.2% compared to -0.5% in 2009, even though the change was not statistically significant.

g. Religion

Non-Christians have a negative impact on health worker visits in both years. In 2009 there was a decrease of 0.5% points in the health worker visits compared to -0.4% in 2014.

h. Family Size, Total Children, children under 5

There is an increase in the likelihood of health worker visits associated with having more total children, particularly in 2014 across all the categories, indicating a potential change in the impact of family size on healthcare utilization over the study period. The presence of children under 5 years old does not significantly impact health worker visits in either 2009 but in 2014 there was an increase in the likelihood of the worker visiting the family with under5 children.

i. Education

The effect of education on health worker visits varies across categories and years. In both years, there is no significant effect for any education category associated with health worker visits. However, in primary and secondary categories there was a decrease in the level of education in 2009 (-1.9% and -05%, respectively) and in 2014 there have a been a positive impact in the health worker visits and both categories (1.2% and 1.4%, respectively).

j. Wealth Index

There is an effect of wealth index on health worker visits in both years but it is not significant. In 2014 there has been a positive increase in the health worker visits in the middle category, dy/dx=0.6 compared to dy/dx= -1.4 in 2009. In the rich category, there seems to be a significant decline of health worker visits in both years.

k. Number of Trips:

The number of trips made does not significantly impact health worker visits in 2009, but there is a positive effect in 2014 for less than 30 trips ad to outside Lesotho, indicating a potential increase in the influence of the number of trips on healthcare utilization over time.

CHAPTER 5: FINDINGS, CONCLUSIONS AND SUGGESTIONS

This section presents the findings of my study and compares them to previous studies conducted in other countries. Additionally, it highlights some interesting aspects found in the study, make conclusions and suggestions about the healthcare sector in Lesotho.

5.1 Findings and Discussions

a. The findings of this study show that longer travel distances to healthcare facilities are associated with lower rates of healthcare utilization in both 2009 and 2014, particularly in rural areas of Lesotho. This observation is consistent with similar research on healthcare disparities between rural and urban areas in India and South Africa, where long travel times were found to hinder timely access to medical care, leading to decreased healthcare utilization. Rural regions of Lesotho often face challenges such as poorly maintained roads, limited healthcare facility infrastructure, and high transportation costs, all of which contribute to restricted accessibility to healthcare services.

b. The shift from distance being a barrier to healthcare utilization in 2009 to actually increasing healthcare visits in 2014 may indicate enhancements in transportation infrastructure and the establishment of new healthcare facilities, particularly in urban areas. Meanwhile, rural areas may have benefited from outreach programs aimed at improving healthcare accessibility

c. While the wealth index did not show statistical significance in either of the studied years, it is noteworthy that households categorized within the middle- and higher-income brackets demonstrated a greater likelihood of utilizing healthcare services. This observation implies a potential socioeconomic influence on healthcare utilization patterns, where individuals or families with relatively higher financial resources may have better access to and utilization of healthcare services compared to those in lower-income brackets. This finding is similar to the

studies done in Sub Saharan Africa. Despite the lack of statistical significance, the trend suggests that socioeconomic status, as measured by wealth index, play a role in shaping healthcare utilisation. Higher-income households may have greater ability to afford healthcare costs, including out-of-pocket expenses, transportation fees, and other associated costs, thereby facilitating increased utilization of healthcare services.

d. Moreover, individuals in middle- and higher-income households may also have better access to information and resources that promote healthcare utilization, such as health insurance coverage, better knowledge to preventive care initiatives, and awareness of available healthcare facilities and services. Therefore, while not statistically significant, the positive association between wealth index and healthcare utilization underscores the potential importance of socioeconomic factors in influencing access to healthcare services.

e. Interestingly, the impact of health insurance on healthcare utilization showed a significant change over the study period. In 2009, the limited availability of health insurance resulted in decreased healthcare visits, possibly due to higher out of pocket health expenditure. However, by 2014, there was a reversal of this effect, suggesting improvements in health insurance accessibility and coverage. The negative association between health insurance coverage and healthcare utilization suggests limitations in the health insurance system in Lesotho

f. In 2009, larger family sizes were associated with higher healthcare utilization rates, particularly in rural areas, indicating greater healthcare needs within these households. However, by 2014, there were no significant associations between family size and healthcare visits, possibly indicating shifts in healthcare utilisation driven by factors such as increased literacy and education in reproductive health, that is, the majority of people may be having knowledge on the use of birth controls.

g. Additionally, individuals engaged in agriculture showed higher utilization of healthcare services in both years, possibly due to the prevalence of subsistence farming and animal husbandry in Lesotho. However, concerns arise as there is a high migration from rural to urban areas for employment opportunities and this may impact the long-term sustainability of agriculture-based healthcare utilization trends. This finding is different from what other studies have found and more investigation is needed on the cause of this in Lesotho.

h. Furthermore, a decreasing trend in healthcare utilization was observed across age categories in both urban and rural areas in both years, with older age groups exhibiting lower odds of healthcare visits, which is consistent with findings from previous studies. This trend could be attributed to factors such as declining health with age and differences in healthcare-seeking behaviour among younger populations.

5.2 Limitations of the study

Firstly, the study is limited to the years 2009 and 2014 as the data for recent years is unavailable, this might not capture many of the recent developments or changes in the healthcare delivery systems. The data analyzed here is relatively outdated and the findings may not exactly reflectthe current situation in the study. Thirdly, due to the short time frame given I was not able to analyze both male and women dataset, I had only concentrated on women, which might be thereason for some of the ambiguous results I found.

5. Conclusion

Overall, the findings highlight the influence of various socio-demographic factors on healthcare usage in Lesotho. Notably, age emerges as a significant factor, with healthcare service utilization consistently declining among older age groups. This could be due to older

women having reduced needs for reproductive health services. Interestingly, factors such as household gender, marital status, wealth index, and health insurance show complex relationships with healthcare usage, deviating from conventional patterns seen in other studies and hence more investigation is needed on this. Particularly surprising is the unexpected negative relationship between health insurance coverage and healthcare visits in Lesotho, which contrasts with global trends. Additionally, despite high poverty rates, the minimal impact of wealth index on healthcare usage deserves further investigation.

In conclusion, disparities persist between urban and rural areas of Lesotho, with rural regions facing greater barriers to healthcare access. These findings reject the first null hypothesis that stated there are no disparities and emphasize the importance of targeted interventions to address healthcare disparities in Lesotho, especially in rural communities. For the second hypothesis too, we reject the null hypothesis indicating that there has been a change in the healthcare sector in Lesotho from 2009 to 2014. Furthermore, the observed changes in healthcare usage over time suggest potential improvements in access to healthcare services, although challenges remain.

5.4 Suggestions

Lesotho's rural regions encounter considerable difficulties in obtaining healthcare services mainly because of inadequate infrastructure. Therefore, it is essential to prioritize infrastructure development, such as road networks and healthcare facilities, particularly in rural areas as many of the developments are clustered around the capital city. This strategy aims to reduce transportation obstacles and guarantee equal access to healthcare for all Basotho

Interestingly, the research has discovered a negative correlation between health insurance

coverage and healthcare visits. This discovery raises the need to critically evaluate the current health insurance schemes in Lesotho. Recommendations include expanding coverage, revising policies to improve accessibility and affordability, especially for rural communities, and ensuring that health insurance schemes effectively encourage the utilization of healthcare services.

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