Determinants of Demand for Health Care Services in Rural Zimbabwe: A Case of Bikita District, Masvingo Province

BY

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DEDICATION

I dedicate this dissertation to my late mother, Margaret and my father, Alfred Chiremba who have natured me to face the challenges of growing old.
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Above all, I would like to give glory to the Almighty God for the strength he gave me during the course of my studies.
ABSTRACT

The study investigated the determinants of demand for health care services in rural Zimbabwe using household data from Bikita District in Masvingo Province. Specifically the study examined the influence of socio-economic and institutional factors such as household income, household size, distance to the nearest health centre and availability of drugs on the probability of seeking of health care from health facilities. From 15 wards which were selected for the survey, 250 households were randomly selected and interviewed. A self-administered questionnaire was used to collect data between January and February 2013. The study used a logit model to find the determinants of demand for health care services based on 176 households that had reported illness of a member within the last three months before the survey. The study revealed the statistical significance of severity of illness, household size, education of the household head, household income, distance to the nearest health facility and availability of drugs as determinants of demand for health care services. Distance to the nearest health facility and household size were found to negatively affect the demand for health care services whereas household income and availability of drugs were found to positively influence demand for health care services. To increase the demand for health care services, the study recommends policies that aim to shorten the distance people travel to health facilities such as introducing community based mobile clinics. Other major recommendations of the study include increasing government funding to rural health facilities so as to ensure the availability of drugs and implementing income generating projects to improve rural household incomes.
## TABLE OF CONTENTS

DEDICATION ........................................................................................................... i  
ACKNOWLEDGEMENTS ......................................................................................... ii  
ABSTRACT ................................................................................................................. iii  
LIST OF TABLES ......................................................................................................... vii  
LIST OF ACRONYMS ................................................................................................. viii  
CHAPTER ONE ............................................................................................................. 1  
INTRODUCTION AND BACKGROUND OF THE STUDY ........................................ 1  
1.0 Introduction .......................................................................................................... 1  
  1.1.0 Health Care Utilisation Trends in Zimbabwe .................................................. 3  
  1.1.1 Zimbabwe’s Health Care Delivery System ....................................................... 4  
  1.1.2 Health care financing in Zimbabwe ................................................................. 5  
  1.1.3 Socio Economic Status of Rural Households .................................................. 7  
1.2 Statement of the problem ..................................................................................... 7  
1.3 Study Objectives .................................................................................................. 8  
1.4 Research Questions ............................................................................................. 8  
1.5 Study Hypotheses ................................................................................................ 8  
1.6 Significance and Justification of the Study .......................................................... 9  
1.7 Scope of the Study .............................................................................................. 10  
1.8 Outline of the study ............................................................................................ 10  
CHAPTER TWO ......................................................................................................... 11  
LITERATURE REVIEW .............................................................................................. 11  
2.0 Introduction .......................................................................................................... 11  
2.1 Health care behaviour in theoretical perspective .............................................. 11  
  2.1.1 Grossman’s demand for health model (1972) ............................................... 11  
  2.1.2 Household’s model of health care demand .................................................... 16  
  2.1.3 Andersen’s behavioural model of health care demand (1968) ....................... 16  
2.2 Empirical Literature Review ............................................................................. 18  
2.3 Summary and conclusion on empirical literature review ................................... 23  
CHAPTER THREE ..................................................................................................... 25  
RESEARCH METHODOLOGY .................................................................................. 25  
3.0 Introduction .......................................................................................................... 25  
3.1 Theoretical model and justification .................................................................... 25  
  3.1.1 The Logit Model ............................................................................................ 27  
  3.1.2 Estimation of Parameters ............................................................................. 28  
3.2 Empirical model .................................................................................................. 28  
3.3 Definition and Justification of variables ............................................................. 29  
3.4 Data Sources and Collection .............................................................................. 33  
3.5 Sample size and sampling procedure .................................................................. 34  
3.6 Diagnostic Tests .................................................................................................. 34  
3.7 Conclusion .......................................................................................................... 35  
CHAPTER FOUR ....................................................................................................... 36  
ESTIMATION, PRESENTATION AND INTERPRETATION OF RESULTS ................. 36  
4.0 Introduction .......................................................................................................... 36  
4.1 Descriptive statistics ......................................................................................... 36  
  4.1.1 Multicollinearity test ...................................................................................... 43  
  4.1.2 Reset test ....................................................................................................... 43  
  4.1.3 Heteroskedasticity test .................................................................................. 43  
4.2 Discussion of the econometric results (Unrestricted Logit model) ..................... 43  
4.3 Presentation of Restricted Logit results ............................................................. 44
4.4 Marginal effects results ................................................................. 46
4.5 Discussion of marginal effects results ............................................. 46
4.6 Conclusion .................................................................................. 48
CHAPTER FIVE ................................................................................. 50
CONCLUSIONS AND POLICY RECOMMENDATIONS ...................... 50
5.0 Introduction .............................................................................. 50
5.1 Summary of main findings .............................................................. 50
5.2 Policy Implications and Recommendations ..................................... 51
5.3 Limitations of the Study and Areas for further Research .................. 52
BIBLIOGRAPHY ............................................................................. 53
APPENDICES .................................................................................. 53
  Appendix a: Correlation matrices ..................................................... 58
  Appendix b: Descriptive statistics for 250 households .......................... 59
  Appendix c: Predicted probabilities .................................................. 60
  Appendix d: Estimation of Unrestricted Logit results (STATA print out) .... 61
  Appendix e: Estimation of Restricted Logit results (STATA print out) ........ 62
  Appendix f: Reset Test results ......................................................... 63
  Appendix g: Heteroskedasticity test ................................................... 64
  Appendix h: Household Questionnaire .............................................. 65
LIST OF FIGURES

FIG1: ZIMBABWE OUTPATIENT (OPD) ATTENDANCE AND INPATIENTS ADMISSIONS, 2004 – 2008.......................... 3
LIST OF TABLES

TABLE 1: AVERAGE CONSULTATION FEES (US $) BY FACILITY LEVEL, 2010 .......................................................... 6
TABLE 2: DISTRIBUTION OF THE HOUSEHOLDS BY CONTINUOUS VARIABLES .............................................. 36
TABLE 3: DISTRIBUTION OF THE HOUSEHOLDS BY SEX OF THE HOUSEHOLD HEAD .................................... 37
TABLE 4: DISTRIBUTION OF THE HOUSEHOLDS BY EDUCATION OF THE HOUSEHOLD HEAD .................................. 37
TABLE 5: DISTRIBUTION OF THE HOUSEHOLDS BY RELIGION OF HOUSEHOLD HEAD ........................................ 38
TABLE 6: DISTRIBUTION OF HOUSEHOLDS BY DEMAND FOR HEALTH CARE SERVICES .................................... 38
TABLE 7: RELATIONSHIP BETWEEN HOUSEHOLD SEX AND THE DEMAND FOR HEALTH CARE SERVICES ........ 39
TABLE 8: RELATIONSHIP BETWEEN SEVERITY OF ILLNESS AND DEMAND FOR HEALTH CARE SERVICES .......... 40
TABLE 9: RELATIONSHIP BETWEEN EDUCATION OF HOUSEHOLD HEAD AND DEMAND FOR HEALTH CARE SERVICES .......................................................... 40
TABLE 10: RELATIONSHIP BETWEEN RELIGION AND DEMAND FOR HEALTH CARE SERVICES ...................... 41
TABLE 11: RELATIONSHIP BETWEEN ACCESS TO VHW AND DEMAND FOR HEALTH CARE SERVICES .............. 41
TABLE 12: RELATIONSHIP BETWEEN NUMBER OF DRUGS TYPES AVAILABLE AND DEMAND FOR HEALTH CARE SERVICES .................................................................................................................. 42
TABLE 13: LOGISTIC MODEL (RESTRICTED) .................................................................................................................. 44
TABLE 14: MARGINAL EFFECTS AFTER LOGIT ...................................................................................................... 46
## LIST OF ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>DHO</td>
<td>District Health Office</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>ZHSA</td>
<td>Zimbabwe Health System Assessment</td>
</tr>
<tr>
<td>HSF</td>
<td>Health Service Fund</td>
</tr>
<tr>
<td>IEC</td>
<td>Information, Education and Communication on Health</td>
</tr>
<tr>
<td>LPM</td>
<td>Linear Probability Model</td>
</tr>
<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>MLE</td>
<td>Maximum Likelihood Estimation</td>
</tr>
<tr>
<td>MoHCW</td>
<td>Ministry of Health and Child Welfare</td>
</tr>
<tr>
<td>MTP</td>
<td>Medium Term Plan</td>
</tr>
<tr>
<td>NHS</td>
<td>National Health Strategy</td>
</tr>
<tr>
<td>OLS</td>
<td>Ordinary Least Squares</td>
</tr>
<tr>
<td>RESET</td>
<td>Ramsey Regression Equation Specification Error Test</td>
</tr>
<tr>
<td>VHW</td>
<td>Village Health Workers</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>ZDHS</td>
<td>Zimbabwe Demographic Health Survey</td>
</tr>
<tr>
<td>ZIMSTAT</td>
<td>Zimbabwe Statistical Office</td>
</tr>
<tr>
<td>ZIMVAC</td>
<td>Zimbabwe Vulnerability Assessment Committee</td>
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CHAPTER ONE
INTRODUCTION AND BACKGROUND OF THE STUDY

1.0 Introduction

Understanding health seeking behaviour has become a central issue for health policy makers in Sub Saharan Africa particularly in the context of rural areas. In recent years, there is an increasing need to cater for the health needs of the poorest members of the society. The poor are argued to be the most vulnerable as they are more likely to fall ill and consequently they face challenges to get efficacious health care services (Odwee and Adebua, 2006).

Grossman (1972) postulated that people’s demand for health care stems from their underlying demand for health. Health is demanded firstly as a consumption good which is a source of utility as an individual enjoys illness free life. Secondly, it is demanded as an investment good as it determines income or wealth levels of individuals (Grossman, 1972). Good health is an important part of people’s well-being and a key component of socio and economic development (Kaija and Okwi, 2004). In contrast, poor health and the inability to cope with illness can be detrimental to welfare and development as it reduces production and income. Seeking self-treatment¹ to manage illness is detrimental to long term health of the people as the treatment is done without consultation from health professionals.

In light of the above, there is a key link between provision of health care services and good health outcomes. Therefore, health systems need to ensure good health status of the people by facilitating utilisation of both preventive and curative health services (WHO, 2001). The Millennium Development Goals (MDGs) have also identified more access and utilisation of health care services as an integral part of the strategies for poverty reduction (Mugilwa, 2005). One of the objectives of Zimbabwe’s health system is to achieve higher utilisation of health care services especially to the vulnerable segments of the population (MTP, 2010).

Although considerable progress has been made in expanding health care services in Sub Saharan Africa in recent years, the utilisation of health care services in the region has remained low particularly in rural areas (Kevany et al., 2011). Rural areas of Zimbabwe are not an exception to this as the demand for of health care services has been reported to be very low (NHS, 2009-2013). An important question in rural areas is whether people have access to

¹Self-treatment in the study refers to the seeking of treatment outside health care facilities.
health care services rather than choosing a preferred provider as most people rely on public provision of health care services.

Studies that have been done in the context of rural areas reveal the importance of socio demographic, economic and institutional factors as determinants of demand for health care services. Muhofah (2010) found out that health care seeking behaviour in a rural context happens within the constraints imposed by demand side barriers. The aim of this study is to establish the factors which determine the demand for health care services in rural Zimbabwe, using household data from Bikita District in Masvingo Province.
1.1.0 Health Care Utilisation Trends in Zimbabwe

The 2000-2008 economic crisis period saw a huge underutilisation of health care services due to shortages of drugs and health care professionals in the country (NHS, 2009 - 2013). The fall in utilisation of health care services has been indicated by reduction in outpatient and inpatient admissions at health facilities. However, there were improvements in utilisation of health care services in Zimbabwe since 2009 (NHS, 2009 -2013). The figure below summarises the trends in utilisation of health care services from 2000 to 2008.

Fig1: Zimbabwe Outpatient (OPD) attendance and Inpatients admissions, 2004 – 2008.


The figure above indicates a decline in health care utilisation starting from during the period despite higher prevalence of diseases. Lower cases of outpatient and inpatient admissions to a larger extent reflected inadequate provision of health care services and barriers to accessibility of health care services. According to the 2009 - 2013 National Health Strategy, utilisation of health care services remained low particularly in rural areas of Zimbabwe even after the 2009. This reflects that there are factors which are influencing seeking of health care services in rural areas. In Zimbabwe, approximately 70% of population in Zimbabwe lives in the rural areas and most people rely on public provision of health care services (ZDHS, 2010).
1.1.1 Zimbabwe’s Health Care Delivery System

The country operates a four-tier health delivery system consisting of primary, secondary, tertiary and central levels of health care which are meant to function as a referral chain (NHS, 2009-2013). The Ministry of Health and Child welfare (MoHCW) is in charge of the health care system for policy planning, administration, allocation of funds and coordinating responses to national health issues among others (ZHSA, 2010). Although the delivery system is dominated by the public sector, health care services are provided by both public and private players. Government operated hospitals and clinics are complemented by those run by private companies and church based organisations (NHS, 2009-2013).

The primary health care is the level at which rural households first receive formal health care services. The level consists of rural clinics and rural hospitals as the mainly health facilities that provide health care services. The primary health care facilities are administered under the supervision of the District Health Office (DHO). This level provides health care services for both preventive and curative needs. As of 2010, the level constituted 1118 primary health care facilities which were 78% of the total health facilities (ZHSA, 2010).

At primary level, physical accessibility of health care is a critical issue which does not need overemphasizing. Firstly, distance to the nearest health facility is one of the factors which may influence the decision to seek health care services in rural areas. The primary health care level which incorporates the first point between the people and the formal health care services should be the most accessible unit of health care delivery system. Physical accessibility to health care services has been found to be a challenge in rural areas as people have been found to travel more than 10 kilometres to find a functional health facility (NHS, 2009-2013). Each rural health centre is expected to cover a population of 10 000 people and the expectation is that people should be within 8 kilometres of walking distance to the nearest health centre. In Bikita District, health care facilities are not evenly distributed as some wards have no clinics.

Furthermore, availability of village health workers (VHW) at primary level plays a pivotal role in improving physical accessibility of health care services. This is because village health workers provide medical treatment to people in the case of minor illness. According to the 2009-2013 National Health Strategy, one village worker is expected to serve 100 households. However, only 46% of rural households have access to a village health worker in their wards (NHS, 2009-2013). Furthermore, the availability of village health workers at primary health care level can be a good proxy for accessibility of public information and education on health (NHS, 2009-2013). Since less than 50% percent of rural households have access to village
health workers, this may suggest that rural households are less exposed to information, education and communication (IEC) on health. Exposure to health information is likely to positively influence seeking of health care services in rural areas as people are advised to visit health facilities in case of illness (Fredrickx, 1998). However, tradition and religious beliefs have been found to influence the use of health care services at primary level in Zimbabwe (MoHCW, 2010). In rural areas, traditional healers and apostolic sect followers often offer alternative care (self treatment) for treatment and prevention of sickness. Their beliefs discourage the use of modern medical care.

1.1.2 Health care financing in Zimbabwe

Health financing in Zimbabwe is broadly divided into public health and private health financing. Public health financing is done through allocation from the national budget to the Ministry of Health and Child Welfare (MoHCW). On the other hand, private health financing comes from private health insurance funds, household out of pocket spending and donor health funding among others.

During the 2000 to 2008 economic crisis period, the health sector experienced a fall in public health financing. Due to poor performance of the economy, the period saw a reduction in public health expenditure and increasing private health expenditure (Munyuki and Shorai, 2009). In this period, public health expenditure as a percent of Gross Domestic Product (GDP) was declining, falling short of the Abuja Declaration’s goal of 15% allocation from the national cake. The bulk of private health expenditure has been borne by households through out of pocket spending on health care services (ZHSA, 2010).

After economic stabilisation in 2009, there was a rebound in terms of public health financing from the budget. Since 2009, the government of Zimbabwe has increased its commitment to provide public health services by increasing funding to the health sector. However, public health care expenditure is still far below 15% of Gross Domestic Product (HSA, 2010). The public health services have remained a small part of Zimbabwe’s economy constituting less than 1% of Gross Domestic Product (ZHSA, 2010). The total health per capita (US$7 in 2009) is still below the World Health Organisation’s requirements for the country².

² WHO estimated that at least US $34 total health per capita per annum is needed to achieve MDGs in Zimbabwe for provision of essential package of health care services to all Zimbabweans.
Furthermore, the priority in terms of allocation of government funds to the four levels of health care is given to tertiary level (central hospitals). Despite the government’s commitment to increase health care utilisation at primary level, where most rural patients contact public health care system, district health care services have remained underfunded. In 2009, the average funding at district level was US$50,641,00 while at provincial and central levels, the allocations were US$362,254,00 and US$4,137,683,00, respectively (ZHSA,2010).

Inadequate funding of the health sector especially at primary level affects provision of sufficient drugs at health facilities. Most rural clinics are less operational due to inadequate supply of basic drugs (MoHCW, 2010). Given that people in rural areas depend on public provision of health care services, inadequate health care services at health centres may influence the seeking of health care services.

User fees have been collected at various level of health care in Zimbabwe as a way to improve mobilisation of resources following the reduction of government’s funding to the health sector. The districts health facilities receive funds from the Ministry of Health and Child Welfare (MoHCW) through the Health Service Fund (HSF) to supplement their revenue. However, due to insufficient resources from the government budget, health facilities have been found to be more dependent on user fees revenue to support their budgets (NHS, 2009-2013). The table below shows government average consultation fees at various levels of health care.

**Table 1: Average consultation fees (US $) by facility level, 2010**

<table>
<thead>
<tr>
<th>Facility level</th>
<th>Average consultation fees</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Hospital</td>
<td>9.75</td>
<td>8 – 10</td>
</tr>
<tr>
<td>Provincial Hospital</td>
<td>5.5</td>
<td>5 – 10</td>
</tr>
<tr>
<td>District hospital</td>
<td>4.1</td>
<td>4 - 5</td>
</tr>
<tr>
<td>Mission hospital</td>
<td>3</td>
<td>1 - 4</td>
</tr>
<tr>
<td>Rural health centre/ clinic</td>
<td>1</td>
<td>1 – 1</td>
</tr>
</tbody>
</table>

Source: Ministry of Health and Child Welfare -Zimbabwe Health Assessment, 2010
1.1.3 Socio Economic Status of Rural Households

Zimbabwe has been experiencing low economic performance as shown by the average growth rate of 6 to 7% in 2009 and 2010 (MTP, 2010). High levels of unemployment and low levels of income seem to have increased barriers to accessibility of health care services in Zimbabwe. Accessing health care services currently includes some form of costs (ZHSA, 2010). The major costs are direct costs which include consultation fees and other medical costs which are charged by health care facilities. According to the 2012 Zimbabwe Vulnerability Assessment Committee (ZIMVAC) report, incomes for the rural households have been found to be generally low and derived from limited range of unreliable income sources. The report indicates that 66% of the sampled rural households earn an average monthly household income which is less than the national rural average of US$ 85. In Masvingo Province, in which Bikita district is found, an average monthly household income was found to be US$ 77. The report indicates that Masvingo is one of the provinces with lower average monthly household income\(^3\). Although the national rural average household size was 5 people, with no significant differences among rural areas, Masvingo had a high dependency ratio of 1.78 compared to the national average of 1.63 (ZIMVAC, 2012).

1.2 Statement of the problem

One of Zimbabwe’s national health development objectives is to achieve high accessibility and utilisation of health care services targeting the poor and vulnerable segments of the population (MTP, 2010). The Millennium Development Goals (MDGs) have also identified increasing utilisation of health care services as one of the ways to eradicate poverty (Mugilwa, 2005). This is because good health status is part of people’s well-being and a key component of socio and economic development (Kaija and Okwi, 2004). Improving utilisation of health care services in rural areas has positive benefits to the country through increased productivity and income. The MoHCW has made efforts since 2009 to increase the provision of health care services (ZHSA, 2010). However, even under these efforts, the utilisation of health care services has remained low in rural areas (NHS, 2009 -2013). Is it because of the socio economic and institutional factors or there are any other factors?

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\(^3\)Other provinces with lowest household income levels include Matabeleland and Midlands provinces with US $66 and US $70 respectively.
1.3 Study Objectives

The general objective of the study is to investigate the factors that influence the demand for health care services in rural Zimbabwe using household data from Bikita District in Masvingo Province. The specific objectives of this study are:

i. To examine whether sex of household head, age of household head, religion, education of household head, household size and household income affect demand for health care services.
ii. To determine the impact of distance on the likelihood of seeking health care services.
iii. To investigate whether consultation fees affect demand for health care services.
iv. To examine the effect of availability of drugs and access to village health workers (VHW) on the likelihood of seeking health care services.

1.4 Research Questions

The study is based on some of the following research questions:

i. How does household income affect demand for health care services?
ii. Does distance to the nearest health facility influence probability of seeking of health care services?
iii. How do consultation fees affect the demand for health care services?
iv. Does availability of drugs and access to village health workers (VHW) influence the demand for health care services?

1.5 Study Hypotheses

The hypotheses that this study seeks to test include:

i. Household income positively affects the demand for health care services.
ii. Distance to the nearest health facility reduces the probability of seeking of health care services.
iii. Consultation fees negatively affect the demand for health care services.
iv. Availability of drugs increases the demand for health care services.
1.6 Significance and Justification of the Study

A critical understanding of the factors that influence the demand for health care services especially focusing more on the disadvantaged segments is of great importance in Zimbabwe. There is need for the policy makers in Zimbabwe to implement policies that aim to increase utilisation of health care services in rural areas which has remained low (NHS, 2009-2013). Improving utilisation of health care services by people living in rural areas is vital for socio and economic development (Kaija and Okwi, 2004). Although the study is specifically done in Bikita District, the findings of the study will help to give insights on the policies which can be implemented to increase the utilisation of health care services in rural areas.

Furthermore, from studies that have been done on health care behaviour in Zimbabwe, the study will advance the little knowledge available on the factors affecting health seeking behaviour in rural settings. In the context of rural areas in Zimbabwe, there is need to advance knowledge on the influence of socio-economic and institutional factors such as household size, household income, distance to the nearest health facility, consultation fees and availability of drugs. Currently, health facilities, for example rural hospitals, are collecting user fees from patients to supplement their budgets. The rural households are the most disadvantaged due to poor socio-economic status (NHS, 2009-2013). Therefore, the study will be useful in understanding of how these factors are influencing health care utilisation in rural areas.

More so, following a growing literature in Sub Saharan Africa, the study will add to the existing literature by establishing factors which influence the demand for health care services in rural contexts. Thus, the empirical findings from the paper will be vital in improving the understanding health care seeking behaviour in rural areas of developing countries.
1.7 Scope of the Study

The study was carried in Bikita District, a rural area in Masvingo Province. The district which is divided into 32 wards has a population of 161 0000. The total number of households in the district is 37056 and the average household size is approximately 5 people (ZIMSTAT, 2012). For the provision of health care services, the district has 23 health facilities. Out of the 23 health care facilities, 3 are rural hospitals namely Bikita Rural Hospital (Government owned), Mashoko Christian Hospital and Silveria Mission Hospital (MohCW, 2010). The rest of the health care facilities are public clinics or rural health centres.

1.8 Outline of the study

The rest of the study is organised as follows; Chapter two reviews both the theoretical and empirical literature on health care demand. Chapter three outlines the theoretical framework, model specification and a discussion on the definition and justification of variables to be used in the study. The same chapter presents the estimation methods and data sources. Estimation, interpretation and discussion of the results are covered in chapter four. Finally, chapter five will conclude the study by presenting a summary of major findings, policy recommendations, and limitations of the study and areas for further research.
CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

This chapter reviews both the theoretical and empirical arguments on the factors that influence the demand for health care services. The first section of the chapter presents the theoretical models of health care seeking behaviour. The empirical section will review empirical findings on the factors which influence the demand for health care services as found in previous studies. The review of both the theoretical and empirical literature will help to identify variables and methodology to be used in modelling the demand for health care services.

2.1 Health care behaviour in theoretical perspective

The study will first discuss the Grossman’s model which provides a theoretical basis upon which many health care demand studies have been done since Grossman’s seminal paper in 1972. The extension of the Grossman’s model will be discussed under the household model and Andersen’s model of health care demand. The predictions of these models will be relevant in this study.

2.1.1 Grossman’s demand for health model (1972)

Building from Becker’s human capital investment model of 1965, Grossman (1972) came up with the first model of the demand for health capital, differentiating health capital from other forms of human capital (Grossman, 1972). The Grossman’s model of demand for health is based on certain underlying assumptions. One of the central assumptions of the model is that individuals are producers of health. The other assumption is that individuals inherit an initial stock of health that depreciates over time at an increasing rate, at least after some stage in the life cycle. Stock of health can also be increased through acts of investment (health is endogenous). Death occurs when health stock deteriorates below a certain point.

In the model, the production function depends on certain environmental variables. The most important factor is the education of the producer that influences the efficiency of the production process. Health is demanded for two reasons namely as a consumption good as it enters directly in individual’s preference function (sick days are a source of disutility) and as an investment commodity which determine the total amount of time available for market and non-market activities. Lastly, the consumers are assumed to have full knowledge on their
health production function and they have infinite planning horizon for their health investment decisions.

Grossman defines health broadly to include longevity and illness free days in a given year which is demanded and produced by consumers (Grossman, 1972). Health is a source of utility and it enters directly into the utility function. The consumer preferences are represented by the following utility function:

\[ U = U(\Phi_t H_t, Z_t), \quad t = 0, 1, \ldots, n \] .................................................. (1)

where \( H_t \) is the stock of health at age \( t \), \( \Phi_t \) is the service flow per unit stock, \( h = \Phi_t H_t \) is the total consumption of health services and \( Z_t \) is the consumption of other commodities. The stock of health in the initial period (\( H_0 \)) is given, but the stock of health at any other age is endogenous. The length of life as a planning date (\( n \)) is also endogenous. Death occurs in period \( t \) if the level of health in that period equals or is below the lowest level of health stock that can sustain life.

Thus, death occurs when \( H_t \leq H_{\text{min}} \). Therefore, the length of life is determined by the quantities of health capital that maximise utility subject to the production and resource constraints. Since an individual can control his or her level of health stock, the model implies that a person can choose his or her level of health stock implying that a person can choose his or her length of days. Good health is important because an individual derives satisfaction from being healthy.

As an investment good, health determines the total amount of time available for market and non-market activities. In the model, an individual inherits an initial health stock which depreciates with age and increases with investment in health. Net investment into health equals gross investment (\( I_t \)) minus depreciation as given by:

\[ H_{t+1} - H_t = I_t - \delta_t H_t \] .................................................. (2)

where \( \delta_t \) is the rate of depreciation during period \( t \) (\( 0 < \delta_t < 1 \)). The rate is assumed to be exogenous, but may vary with age of the individual.
Consumers produce gross investment in health and other commodities in the utility according to a set of household production functions:

\[ I_t = I_t(M_t, TH_t, E) \]

\[ Z_t = Z_t(X_t, T_t, E) \]

where \( I_t \) is gross investment which is a function of medical care \( (M_t) \), the time input in the investment function \( (TH_t) \) and the stock of human capital given by \( E \). \( Z_t \) is the consumption of other goods and is a function of \( X_t \) which is a vector of goods input that contribute into the production of commodity \( Z_t \). \( T_t \) which is time inputs for \( Z_t \) and \( E \) which is the stock of human capital (education level). Grossman assumed that a shift in the human capital changes the efficiency of the production process in the non-market sector of the economy.

In the Grossman’s model, medical care is treated as the most important market good in the gross investment good function. However, medical care is not only the market good as inputs such as housing, diet, recreation, cigarette smoking and alcohol consumption among others, influence one’s level of health. Thus, an individual demands health care together with other health enhancing activities to improve health status. A healthy person is therefore able to devote more time to work and earn income. As a result, health is an investment good. A person will continue to invest in health to continuously earn a return, good health.

The model assumes that an individual is faced with a goods budget constraint that equates the present value of outlays on goods to the present value of earnings income over the life cycle plus initial assets (discounted property income):

\[ \sum_{t=0}^{\infty} \frac{P_t M_t + V_t X_t}{(1 + r)^t} = \sum_{t=0}^{\infty} \frac{W_t T W_t}{(1 + r)^t} + A_0 \]

where \( P_t \) and \( V_t \) are the prices of medical care \( (M_t) \) and \( X_t \) respectively, \( W_t \) is the hourly wage rate, \( TW_t \) are hours of work, \( A_0 \) is initial assets and \( r \) is the market rate of interest. The consumer is faced with a time constraint requiring that the total time available in any period given by \( \Omega \), should be spent on all possible uses such that:

\[ \sum_{t=0}^{T} T W_t = \Omega \]

\[ ^4 \text{Grossman assumed that all production functions are homogenous of degree one in the goods and time inputs.} \]
\[ TW_i + TH_i + T_i = \Omega \] ........................................ (5)

where \( TH_i \) is the lost time from market and non-market activities due to illness or injury. A single full wealth constraint is obtained by substituting for hours \( TW_i \) of work from equation (5) into equation (4) as given below:

\[
\sum_{j=0}^\infty P_j \cdot M_j + V_j \cdot X_j + W_j \cdot (TL_j + TH_j + T_j) \bigg/ (1 + r)^j = \sum_{i=0}^\infty \frac{W_i \cdot \Omega}{(1 + r)^i} + A_0 \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (6)
\]

From equation (6), full wealth (RHS) equals to initial assets \( A_0 \) plus present value of the earnings an individual would obtain if he spent all his time at work. Part of this wealth is spent on market goods, another part on non-market production and the last part of it is lost due to illness.

The equilibrium level of health stock, \( H_i \) and \( Z_i \) can be obtained by the maximisation of the utility function (1) subject to a set of production functions given by (3), budget constraint (6) and the net investment function (2).\(^5\) The equilibrium level of health will depend on the amount of resources allocated to the production of health. The level will depend on the shadow prices of health capital, the rate of depreciation and the discount rate. Since the inherited stock of health and the rates of depreciation are given, the optimal quantities of gross investment determine the optimal quantities of health capital.

Grossman’s model has been decomposed into two versions namely the pure investment version and the consumption version. In the pure investment model variant, investing in health has a return in terms of added labour income and wealth. Health in a pure investment model is demanded because of its impact on future health which has direct bearing on productive potential of an individual. Investment in health is done in order to guarantee good health and there is a motive that influences individuals to invest in health. Individuals invest in health by demanding medical care and other health improving activities so as to increase their health status.

On the other side, in a pure consumption good model, Grossman (1972) postulated that good health in its own right has consumptive benefits. Feeling good health generates utility while poor health is a source of dis-utility. Individuals demand optimal health because it accords them opportunity to enjoy life in general.

\(^5\) See more details from Grossman’s 1972 model, pages 223 – 255.
The theoretical predictions of the Grossman’s model are based on age, education and wages. In both variants of the model, age is inversely related to health demand. This means that the demand for health decreases when people grow old because age reduces payoffs from investment in health. Older people are less efficient at turning health investment in health stock. If age increases, the marginal cost of holding an additional unit of health stock also increase. Thus, age reduces demand for health in both the consumption and investment variants. However, the model predicts that health stock decreases with age and people are expected to demand more health care as they grow up. Education in the model is positively related to demand for health stock in both variants. Increasing in education captures increasing knowledge in the production of health and it enables individuals to choose more health consumption decisions which lower the rate of health capital depreciation. If a person is more educated, that person can also be regarded as more efficient producer of health investments. The implication of education in the model is that those individuals with more number of school years are likely to effectively utilize resources to produce health and demand less health care services.

The effect of wages on the demand for health is different in the two variants of the model. In the pure consumption case, wages reduce the demand for health because the higher the future wage, the higher the marginal cost of holding health stock as consumption good. On the other hand, wages are positively related to demand for health as increases in wages increase the incentive for individuals to work and incentive to be healthy by increasing the returns to health capital. Thus, higher wage workers will tend to increase their optimal health stock. Lastly, the price of health care negatively affects the demand of health since higher price of medical care services increases the cost of health investment.

Grossman’s model of health stock is very important because it gives important factors which influence demand for health and health care. As demand for health increases, the demand for health care services should also increase hence demand for health care is a derived demand. An individual may determines his optimal stock of health capital by the choice he or she makes. From this model, health care utilization is seen as choice decision by individuals who demand and produce health. In summary, demand for health care is hypothesized in the theory to depend on age, sex, education, time variables, in addition to price and income.
2.1.2 Household’s model of health care demand

Health care demand studies have since taken a point of departure from Grossman’s model to analyse health care utilisation. Many studies have used household as a unit of analysis rather than using an individual. Hjortsberg (2002) argued that Grossman’s model lacked the fact that individuals are household members and they take much influence from other household members. In several studies, household characteristics have been found to influence health seeking decisions.

Jacobson (1998) (as cited in Hjortsberg, 2002), extended the Grossman’s model into a model in which the family is viewed as the producer of health. Jacobson’s model viewed a household with same preferences and the main conclusion was that not only the individual’s own income, but the household’s combined resources are used in the production of health. The model of demand for health developed by Grossman put the individual as a sole decision maker. In most rural areas of Zimbabwe, as in most African countries, the decision of an individual to visit a health care facility is not made by that individual alone. The head of the household plays an important role in influencing seeking of health care services in the household.

From discussions on household theories of health care demand, it is likely that household characteristics such as household size, sex of household head, education of household head and household income affect health care utilisation. In the context of rural areas, the head of the household makes most of the decisions.

2.1.3 Andersen’s behavioural model of health care demand (1968)

Andersen’s behavioural model was first developed in 1968 to help in explaining the differences in access to health services in the United States of America (Satayavongthip, 2001). The model is the most widely used analytical model to explain health care utilisation behaviour. Andersen and Newman, (1973) and Becker et al., (1993) (as cited in Sunil et al., 2000), argued that the use of health care services in any given society is a complex behavioural phenomenon. The model gives an overview of relevant social determinants for seeking health care services. The theoretical framework describes the process of health care utilisation as a causal interaction of three different levels which are societal, health care system (programme factors) and individual determinants.
The societal and system determinants are postulated to influence individual determinants which in turn directly influence the use of health care services. The societal determinants include the current state of knowledge as well as people’s attitude and beliefs about health and illness. The health care system in turn allocates available resources to health care institutions and forms the organisational framework to provide health care services (Stefan and Markus, 2010). The system factors include structures and activities through which health care and health education are provided. For example, system factors would consider the availability of information, education and communication (IEC) activities in a village to educate people on health care services (Sunil et al., 2000). The organisation component of the system factors addresses how services are delivered to people who are in need. These factors include distance to the nearest health facility, access to village health workers and user fees. The theoretical framework hypothesizes that the individual’s decision to seek health care services is a function of three sets of variables namely the predisposing, enabling and need factors. These factors are explained below:

- **Predisposing factors**

The model postulates that there are certain factors that predispose people towards health care service utilisation. These factors influence an individual to seek health care services. For example, the basic demographic characteristics such as age, sex and past illness may have an influence on the demand for health care services. The social structure factors such as education, household size, occupation and race are also important predisposing factors. More so, beliefs, values and knowledge about health and medical care services can affect a decision to seek health care services.

- **Enabling factors**

Enabling conditions make health service resources available to an individual. Even if an individual may be predisposed to the use of health care services, some means must be available for him or her to do so (Andersen and Newman, 1974). These factors include both individual and household resources (income and health insurance). The availability of the health care services is also an enabling factor. Attributes of the community or region in which people live such as place of residence are important since they indicate geographic proximity to the source of care as well as local attitudes about health care services.
Need factors

The need for a service (illness) is perhaps the most important factor which influences health care service utilisation. Even with the existence of predisposing and enabling factor, the individual seeking health care services must still perceive the need for health care before seeking it. A perception of illness is necessary for the use of health care services. The need for care may be perceived by the individual and reflected in reported symptoms or disability days.

One of the weaknesses of Andersen’s model is that it does not directly consider distance as a factor which affects health care service use (Rajaram et al., 1999). The model nonetheless provides a good theoretical framework in analysing health care seeking behaviour especially in rural areas. The model will be used to establish explanatory variables to be included in the study.

2.2 Empirical Literature Review

Frederickx (1998) carried out a study on the determinants of health care demand and health care choice in rural Tanzania using logistic regression. The objective of the study was to investigate the factors influencing health care utilisation in households living in rural areas of Tanzania. The study used rural household data on selected districts from Tanzania Human Resources Development Survey of 1993 and 1994. The study employed logit model to analyse the factors influencing health care demand. The dependent variable measuring health care demand was dichotomous, with one in the case of incidence of treatment and zero for no treatment sought\(^6\). The independent variables were classified into individual, household and community variables. These variables include age, sex, and household income, household size, household head education, sex of household head and distance to the nearest health facility. Health care expenditure per capita in each community was also used as a proxy for quality of health care services.

Descriptive statistics of the study showed that out of 15% of the sample who suffered from illness or injury prior to the survey, 66% of them did not receive any form of treatment. Using the regression results, age and household monthly income per member were found to be statistically significant at 1% whereas the proportion of girls in the household, sex of the household head and distance to the nearest health centre were found to be statistically significant at 5% and 10%, respectively.

\(^6\) In the household survey, individuals were asked whether treatment was sought and the type of treatment sought during any illness or injury 4 weeks prior to the survey.
significant at 5% level of significance. The sex of the respondent, proportion of boys in the household, age of the household head and education of household head were found to be statistically insignificant. Although the study confirmed the positive influence of education on health care demand as predicted by Grossman (1972), the insignificance of the coefficient suggests that education of household head has little impact on health care use decisions by household members.

The study by Frederickx (1998) gives a fair representation of the determinants of health care demand in rural areas of a developing country. One of the strengths of the study is that such results have been obtained from a large sample size covering several rural districts. However, the impacts of direct costs such as user fees were not directly factored in the study which makes the study less informative. In Zimbabwe most health surveys argued that user fees have been major barrier to accessibility of different forms of health care (ZHSA, 2010; NHS, 2009-2013).

Using a logistic regression, Hutchinson (1999) in Uganda found out distance is the major factor that contributes to low utilisation of health care services in rural areas. The study used data from Ugandan Household Survey to produce micro econometric work on determinants of health care demand in the context of rural settings. In his study, he found out that the majority of the population in rural areas had to walk to the health facility since transport was not readily available. As a result poor families relied more on self-treatment and use of traditional healers. More specifically, the study found out that for each extra one kilometre travelled to the health unit, the use of health care fall approximately by 1%. In the same study, other factors which were found to affect health care utilisation were household size, age, income and an individual’s level of education.

Another study by Sarma (2000) was done in India to investigate the determinants of demand for outpatient health care and the choice of health care provider. The objective of the study was to examine the impact of monetary and non-monetary price, income and a variety of individual and household specific characteristics on the demand for health care in rural India. The study utilised data from India’s national sample survey. Unlike the study by Fredrick (1998) who excluded price of health care, the study by Sarma (2000) used variable choice set based on geographical location, price, income and severity of the illness to reflect true health care behaviour in rural India.
Using multinomial logit regression, the study by Sarma (2000) found out that prices and income were statistically significant determinants of health care demand and the choice of the health care provider by individual in rural India. However, the study found out that demand for health care was price and income inelastic. Distance to the nearest formal health care facility was found to negatively affect the demand for outpatient health care after controlling a number of socio-demographic factors. Other factors such as age, sex, educational status of the household members and the number of children in the household were found to be statistically significant factors which affect the demand for health care and the choice of health care provider in rural India.

In Bangladesh, Howlader et al., (2000) analysed health care demand using the willingness to pay approach. The use of the willingness to pay approach was motivated by the fact that there was no market for the majority of health care services in Bangladesh. One of the specific objectives of the study was to derive demand for health care function for three health care types namely child immunisation, curative care for children and women’s health care in the context of rural Bangladesh. The study utilised primary data which was collected from a total sample of 2210 households using a structured household questionnaire. Sampling was carried out using cluster sampling. The study used a dichotomous dependent variable for measuring demand for health care where willingness to pay for health care took value of one whereas zero represented not willing to pay for health care. Among the explanatory variables which were used included household income, duration of illness as a proxy for severity of disease and education level of respondents. A logit model was employed to examine the statistical significance of the factors. Household income and education of the household head were statistically significant at 1% and 5%, respectively.

In another study by Rajaram et al., (1999) individual and programme factors were found to be significant in explaining maternal care utilisation in rural India. Their objective was to examine the factors influencing utilisation of maternal care services among women in rural India using Andersen’s behavioural model. Data collected through the National Family Health Survey was used in the study. A set of variables such as religion, education, household income and other individual variables were used as explanatory variables. Using an ordered logit model to estimate maternal care demand, the study found out that there was a substantial variation in the likelihood of utilisation of maternal care services by religion. Only 18% of the birth to Muslim women received excellent maternal care services compared to 38% of the births to women belonging to religions other than Hindu and Islam. In the same study,
education of woman, household standard of living index, distance to the nearest government health facility and women’s exposure to education, information and communication (IEC) from village health workers during pregnancy had strong and statistically significant influence on the utilisation of maternal care services in rural India.

One of the strengths of the study by Rajaram et al., (1999) is the inclusion of program factors to strengthen the importance of IEC activities in creating awareness about the use of health care services in rural areas. Although the study was specifically for maternal health care demand, a proxy for programme factors will be considered in analysing the demand for health care services in the context of rural Zimbabwe.

Another study by Flores et al., (2001) was done using a binomial logistic regression to analyse people’s response to illness in Mexico. The objective of the study was to investigate illness factors associated with either use of medical care or self-care to resolve health problems in Mexico. The study used a total of 5640 individuals who reported illness within the two weeks before the 1994 National Health Survey. A descriptive analysis was conducted using demographic and socio-economic status characteristics, access to medical services, perception of seriousness of the illness and treatment received. Out of the sample, 62% used self-care which represented a large proportion than those who sought medical care. The study found out that 52% of the sample who perceived their illness as serious did not use medical care because they considered them too expensive for them.

Lawson (2004) used a discrete choice model to examine the determinants of health care seeking behaviour in rural Uganda. The study was motivated by the introduction of user fees for most health care services in Uganda. Hence, the study sought to justify econometrically the impact of user fees and income on health seeking behaviour in Uganda. The study used secondary data from two Demographic Health Surveys and a 1999-2000 Ugandan National Household survey (UNHS). Demand for health care was dichotomous, measured by the probability of a person seeking health care for any illness over the past thirty days and the choice of health care provider. Variables such as sex, age, household size, personal education, religion and income were used in the study as explanatory variables. These factors were analysed across gender and for all ranges of age including adults, school aged children and preschool children.

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1Dependent variable was binary; one if health care was sought and zero in case of no seeking of health care.
Descriptive statistics of the study by Lawson (2004) revealed districts geographical differences, with more people seeking health care in urban areas than in rural areas. When disaggregating by income levels, higher income levels were found to significantly increase health care demand. In particular, individuals who were in the highest income quartile were found to use health care services more than those individual in the lowest income quartile. Out of the sample, the use of health care by females and males were 68.7% and 68.6%, respectively. This suggests that there was no much difference in health care utilisation between males and females. The results were consistent with those obtained by Frederickx (1998) in Tanzania. The logit results for adults indicated that age, user fees and distance were statistically significant factors affecting seeking of treatment and the choice of health care provider. The results for the adults showed that the demand for public health care services seemed to decrease at old age for both males and females. This relationship was captured by the negative sign of age – squared variable in the model for adults. More so, the study found out that user fees reduce the probability of individuals’ choice of seeking public health services and such findings are similar with the findings of other studies in Sub Saharan Africa.

In Senegal, Lepine and Nestour (2011) used binary logit regression to study health care utilisation in a rural context. The objective of the study was to analyse the determinants of use of curative care from individuals in rural Senegal. The study used data from households which were interviewed in a survey using a two stage stratified sampling procedure. Among the variables which were used as independent variables were household economic status, education, price and quality of medical care. The study used a binary dependent variable measured by whether a visit to a qualified health worker was done during an individual’s last illness. The ranked reasons for not seeking health care services from a qualified health worker were preference to use self-care (highest), health care being expensive, disease not severe and long distance (lowest). From the results of the logit model, health insurance ownership, age, education, price, quality of medical care and household economic status were found to be significant determinants of the likelihood of seeking health care services.

In another study in Uganda, Muhofah (2010) analysed the determinants of use of formal health services in Butalejah, rural district. The study investigated the relationship between economic factors, socio-demographic characteristics, institutional factors and the use of formal health care facilities. The study was motivated by low utilisation of formal health

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9Individuals in the richest income quintile were 5.5 times more likely to seek care than from the poorest quintile.
facilities particularly in rural areas despite improvements in the health indicators in the country. The factors were analysed using both the Chi-square statistics and logistic regression. Using the Chi-square, there was a significant relation between age, sex, educational background, income, religion, household size and occupation of respondents and the use of formal health care services at 5% level of significance. Using the logit results, all factors were significant at 5% except marital status, distance and quality of medical care. Although basic primary education was highly correlated with increase in use of health care, education negatively influenced the decision to seek rural health care services in the study. The results were justified because the study was based on preventive health care and not curative health care. More educated individuals may not regularly utilise health care services because they are more producers of health as compared to those who have basic primary or no education (Grossman, 1972).

In Zimbabwe, a related study by Kevany et al., (2011) was done on the relationship between socio economic status and the choice of health care provider care in Zimbabwe using 2005 - 2006 household survey data from Mutoko district. The objective of the study was to assess the impact of socio economic status on choice and uptake of health care providers. A total number of 5116 households responded where they most utilised medical care in case someone in their family was sick or hurt. The choices included traditional healers, pharmacies, government clinics, government hospitals and private hospitals. The qualitative study based on Chi-square statistics found out that socio economic status measured by household assets had a strong association with both overall utilisation of health care services and the utilisation of specific health care providers.

2.3 Summary and conclusion on empirical literature review

From empirical literature discussed, there is evidence to suggest that demand for health care services especially in rural contexts is influenced by socio demographic, economic and institutional factors. These factors include age, sex, education, household size, household income, religion, distance, price of health care and quality of health care (availability of health care services) among others. General findings from Sub Saharan Africa reveal a negative relationship between user fees and demand for healthcare services. However, in some studies, consultation fees were not significant. Most studies have also found out that distance to the nearest health care centre is as important as price in influencing the demand for health care services in rural areas.
Despite evidence from other countries on the factors that influence health care demand in rural areas, there is little knowledge in the context of Zimbabwe. Studies on health care utilisation in Zimbabwe concentrated in urban areas leaving little knowledge in rural areas. Therefore, guided by empirical literature, this study seeks to investigate the factors which influence the demand of health care services in rural Zimbabwe using household data from Bikita District, Masvingo Province.
CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This study seeks to investigate the determinants of demand for health care services in rural Zimbabwe using household data from Bikita District. This chapter outlines the methods and procedures that will be employed to identify the determinants of demand for health care services. The first sections present a theoretical and empirical model. The chapter will also show the definitions and justification of variables that are going to be used in the study. The last sections are on data sources and diagnostic tests to be carried out.

3.1 Theoretical model and justification

The purpose of the study is to model the demand for health care services. There are several ways of measuring health care demand. According to Fredrickx (1998), the demand for health care can be measured by the probability of visiting a health centre in case of illness or by the type of the treatment (choice of health care provider). In this study, the demand for health care services is defined as the probability of seeking health care services from a clinic or hospital conditional on illness in the household. When a household member has fallen ill, either health facility treatment or self-treatment can be sought. Given the two distinctive cases of seeking health care services or self-treatment, binary response models are the most appropriate for the study.

The study has the option of using the linear Probability Model (LPM), the Logit or Probit models since the dependent variable is binary. However, the study avoids the use of the LPM which is estimated using Ordinary Least Square (OLS) since it suffers from a number of econometrics problems. The problems associated with using LPM are as below:

(1) Non-fulfilment of the probability rule of \(0 \leq E(Y_i) \leq 1\). There is no guarantee that predicted values of \(Y\) will all lie between 0 and 1

(2) Heteroskedasticity of the disturbances (\(U_i\)).

(3) Non-normality of the error term.

\(^{10}\)In the study, self-treatment option include no treatment at all

\(^{11}\)See Gujarati (2003)
(4) Limited usefulness of $R^2$ as a measure of goodness of fit and the constant marginal effect.

Linear Probability Model (LPM) is a linear model that assumes a linear relationship between the dependent variable, $Y_i$, and a set of independent variables ($X_i$). It gives an impression that marginal effect given by $\beta_i$ is always constant irrespective of the values of $X_i$ (Wooldridge, 2004). When using a Linear Probability Model, one cannot compute marginal effect with respect to a dummy variable.

Given the above limitations of the Linear Probability Model, the only options available are the other two binary models namely the Logit or Probit model. Logit and Probit models are non-linear models which do not assume constant marginal effects. A specific non-linear model is given by:

$$y = \frac{\exp(a + bx + dd)}{1 + \exp(a + bx + dd)}$$

From the above, $\frac{\Delta y}{\Delta x}$ which is the marginal effect, depends on the specific values of $x$ and $d$. In a multiple regression model, marginal effect will be a function of the entire vector of explanatory variables, including dummy variables.

According to Wooldridge (2004), regressions of categorical dependent variables are non-linear. Even when linearity is created, for example in the Logit model, marginal effect is not constant, but depends on the values of the entire vector of explanatory variables. In the non-linear models, OLS cannot be used to estimate parameters. The only standard approach to estimate either the Probit model or Logit model is to use the Maximum Likelihood Estimation (MLE) based on the idea of sample information (Wooldridge, 2004). The Maximum Likelihood Estimation is concerned about picking parameter estimates that imply the highest probability or likelihood of having it obtained from the observed sample. The objective of the MLE is to choose the estimates of the coefficients that make the likelihood of observing a particular outcome of the dependent variable as large as possible. In the context of binary choice models, a likelihood function is achieved by treating each observation as a single draw from a Bernoulli distribution.
The choice between a Logit or Probit model is a matter of preference as empirically either Logit or Probit models can be used. There is little difference between the predicted probabilities from the Probit and Logit models\textsuperscript{12}. The two models give almost similar results (Gujarati, 2003). Theoretically, the choice depends on the assumption of the distribution of the error disturbances. A Logit model assumes that error terms follow a logistic distribution while a Probit model assumes normality in the distribution of error terms. However, a Logit model is very popular as compared to the original Probit model because it is simple to interpret. A Logit model has a relatively simple form for the first order conditions and asymptotic distribution (Cameron and Trevedi, 2005). In the Logit model, one can also interpret the coefficients in terms of log of odds ratio. Hence, the study will employ a Logit model. Empirically the Logit model has been widely used in health care demand studies as highlighted in the previous chapter.

3.1.1 The Logit Model

This study uses the Logit model as a technique of estimation. The assumption of the Logit model is that the error term follows a logistic distribution. The model takes the following functional form:

\[
P_i = E(Y = 1 | X_i) = \beta_1 + \beta_2 X_i
\]

where \( P_i \) is the probability of seeking health care services given a vector of explanatory variables, \( X_i \). The expression can be presented as follows:

\[
P_i = E \left( Y = 1 \mid X_i \right) = \frac{1}{1 + e^{-(\beta_1 + \beta_2 X_i)}}
\]

Re-writing the above for ease of exposition gives:

\[
P_i = \frac{1}{1 + e^{-Z_i}} = \frac{e^Z}{1 + e^Z} \quad \text{where} \quad Z_i = F(\beta_1 + \beta_2 X_i)
\]

The above expression represents a cumulative logistic distribution function. \( P_i \) is non-linear in \( Z_i \) (that is in \( X_i \)) and in \( \beta \)'s. Therefore the OLS procedure cannot be used to estimate the parameters. The above expression can be linearised as follows;

If \( P_i \), the probability of seeking health care services is given as above, then \( 1 - P_i \), the probability of not using health care services is given by:

\[
1 - P_i = \frac{1}{1 + e^{Z_i}}.
\]

Therefore, the ratio of probability of success to failure (odds ratio), will be written as

\[
\frac{P_i}{1 - P_i} = e^{Z_i}.
\]

Taking natural logarithms of the above in both sides yields the Logit model given by:

\[
L_i = \ln \left( \frac{P_i}{1 - P_i} \right) = Z_i = \beta_1 + \beta_2 X_i ,
\]

where \( L_i \) is the log of odds ratio which is linear in \( X \) and in parameters, \( \beta \)'s.

### 3.1.2 Estimation of Parameters

As already highlighted above, the parameters will be estimated using the MLE method. The procedure does not require assumptions of normality or homoskedasticity of error values.

### 3.2 Empirical model

The empirical model is borrowed from earlier studies by Fredrickx (1998) and Lawson, (2004). However, more variables have been added for the model to be suitable in the context of rural Zimbabwe. The empirical model is specified as follows:

\[
\text{Demand} = F(\text{Age, Agesq, Hsex, Heduc, Hsize, Sever, Userf, Hinc, Dist, Acvhw, Relig, Avail})
\]

Or equivalently

\[
P(\text{Demand} = 1 | X) = \beta_0 + \beta_\text{age} + \beta_\text{age}^2 + \beta_\text{hsex} + \beta_\text{heduc} + \beta_\text{hsize} + \beta_\text{sever} + \beta_\text{userf} + \beta_\text{hinc} + \beta_\text{dist} + \beta_{10} \text{acvhw} + \beta_{11} \text{relig} + \beta_{12} \text{avail} + u_i,
\]

where \( P(\text{Demand} = 1 | X) \) is the probability that a household member will seek health care services on condition of illness, given the vector of observable socio-demographic, economic and institutional characteristics:

\( \beta_0 \) Is a constant?

\( \text{Age} \) is age of the household head

\( \text{Agesq} \) is age squared of the household head
\( Hsex \) is sex of the household head

\( Heduc \) is household head education

\( Hsize \) is household size

\( Sever \) is the severity of the illness

\( Userf \) is user fees

\( Hinc \) is household income

\( Dist \) is distance to the nearest health facility

\( Acvhw \) is the access to village health workers (VHW)

\( Relig \) is religion

\( Avail \) is the availability of drugs as measured by number of drugs types available

\( u_i \) is an error term.

### 3.3 Definition and Justification of variables

From both the theoretical and empirical literature that has been reviewed in the previous chapter, demand for health care services is likely to be influenced by the following variables namely age of household head, sex of the household head, household size, religion, education of household head, household income, severity of illness, user fees (consultation fees), distance, access to village health workers and availability of drugs. The study will use these variables to test whether they are significant in influencing health care services.

**Demand for health care services** (\( Dem \))

The study will use a binary dependent variable which takes value of one when a sick household member seeks treatment from health care facilities and zero will be assigned in case of self-treatment. The binary dependent variable model was used by several studies to find the determinants of health care demand as revealed in the previous chapter:\(^{13}\)

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\(^{13}\)Studies by Fredrickx, (1998) and Lawson, (2004) used logit model to find the determinants of health care demand in Tanzania and Uganda respectively.
**Age of household head** \((\text{age})\) and **Age of household head squared** \((\text{age } \text{sqr})\)

This is a continuous variable which captures the age of the household head in years. The study expects higher utilisation of health care services in households whose heads are still young. Since at young age most household heads have low experience in managing illness, the probability of seeking treatment from health care facilities is expected to be high. However, when the household head is very old, seeking health care services is expected to decrease as chances of self-treatment will be very high (Lawson, 2004). Hence, the study uses age squared to capture the effects of old age of a household head on demand for health care services.

**Sex of the household head** \((\text{hsex})\)

The sex of household head is defined as a dummy variable. A value of zero and one will be assigned to a male and female household heads respectively. This variable intends to establish if there is a relationship between sex of a household head and the demand for health care services by a household member. Most studies expect to find the likelihood of seeking health care services to be higher in female headed households than in male headed households. The argument is that females by nature are risk averse and they prefer household members to be attended by health professionals during illness. However, the influence of gender on seeking health care has remained inconclusive in the empirical literature. Therefore, the variable is ambiguous.

**Education of household head** \((\text{heduc})\)

In the study, education is a categorical variable which is measured by the level of formal education attained by the head of the household. The variable is coded as follows: No education = 0, Primary education = 1, Secondary education = 2 and Tertiary education =3. One of the justifications of using education as a categorical variable is that the variables will capture the incremental effects of the levels of education (Kaija and okwi, 2004). In line with Grossman’s theoretical model on health, education is an important factor which affects health care seeking behaviour. Education increases efficiency in health production and thus reduces the price of health investment and returns on health are likely to be higher for the more educated (Grossman, 1972). Education of a household head may affect the recognition of symptoms and link them with presence of a disease. This will affect the perception of illness, its degree of severity and consequently the probability of visiting a health care provider (Grossman, 1972; Hjortsberg, 2003). Therefore, a priori expectation is that the more educated
the household head is, the higher the probability of seeking health care services by a household member. Hence, the study expects a positive relationship between demand for health care services and the education of the household head.

**Household size (hsize)**

This variable will be measured by the number of members in the household. A priori expectation is that household size is negatively related to demand for health care services. Individuals from large households are less likely to seek health care services from health facilities (Lawson, 2004). This is because the larger the household size is, while household income is constant, the lower per capita income. In households with more members, income may not be adequate to meet the direct and indirect costs of accessing health care services. Hence, there are high chances of seeking self-treatment in households with more members as compared to households with fewer members.

**Severity of illness (sever)**

Since the study is based on illness of a household member, this variable becomes important. However, measuring severity of illness is difficult and the study uses bedridden as a proxy for severity of illness which has been used by other studies. If a household member is bedridden due to sickness, it is an indication that the illness is severe. From empirical literature, when the illness is perceived to be serious, then the likelihood of ignoring illness or seeking self-treatment will be low. According to Andersen’s behavioural model, a perception about the severity of illness is an important determinant for the use of health care services. The study expects a positive relationship between severity of illness and the demand for health care services. This variable will be used as a dummy. A value of one will be assigned when the sick household member is bedridden and zero when he or she is not bedridden.

**Consultation fees (userf)**

Consultation fees represent the cost of accessing health care services. In line with Grossman’s model, price of health care negatively affects health care demand. Furthermore, a number of studies reviewed in the previous chapter, found out that user fees are more likely to reduce the utilisation of health care services. In rural areas of Zimbabwe, for a patient to be attended to, especially at rural hospitals, consultation fees are paid. Other costs, for example, the cost of buying drugs, depend on the prescriptions given. Therefore, the study expects the demand for health care services to be negatively affected by consultation fees. The study will use
consultation fees as a proxy for user fees. The variable will be continuous, measured in United States dollars.

**Household income (hinc)**

The level of household income reflects the economic status of the household. Both the theoretical and empirical evidence have confirmed a positive relationship between income and the demand for health care. In the investment variant of Grossman’s model, wage has a positive impact on the demand for medical care\(^{14}\). From the empirical literature, several studies have found that household income increases the likelihood of seeking treatment from health care facilities (Lawson 2004, Fredrickx, 1998). Therefore, the study expects the probability of seeking health care services by a household member to increase with higher household income. The monthly income earned will be used as a proxy for household income. The variable will be continuous.

**Distance to the nearest health facility (dist)**

Distance to the nearest health facility will be measured in kilometres and the variable will be continuous. Distance to the nearest facility measures physical accessibility of health services in the community. From the empirical evidence, studies review that the demand for health care services tends to decline with distance (Muhofa, 2010). Thus, from evidence, the study expects a negative relationship between demand for health care services and distance to the nearest health care facility. There is a higher probability that a household member will seek health care services during illness if the household is close to a health care facility.

**Access to village health workers (acvhw)**

According to the National Health Strategy (2009-2013), village health workers can influence the demand for health care services in two ways. Access to village health workers can reduce the probability of seeking treatment from health care facilities because village health workers provide drugs for minor illness. On the other side, access to village health workers may positively influence seeking health facility treatment. This is because access to village health workers can be used as a proxy for availability and accessibility to public information, education and communication activities (IEC). According to Andersen, (1968), availability of IEC programmes in the community is an important determinant of seeking health care services as people are advised to seek treatment from health facilities. Therefore, access to

\(^{14}\) See Grossman (1972 a).
village health workers may either positively or negatively influence demand for health care services. The variable will be a dummy variable and will be coded as follows: a value of zero will be assigned if a household has no access to village health workers and a value of one will be assigned if a household has access to village health workers.

**Religion and traditional beliefs** (*relig*)

Religion and socio-cultural beliefs play a role in influencing health care seeking behaviour in rural areas of Zimbabwe (MoHCW, 2010). For example, household heads who believe in traditional healers or in apostolic sect religion tend to discourage the use conventional medical care. Rather, they tend to prefer self-treatment as an alternative to treatment from hospitals when a household member has fallen ill. The study expects lower probabilities of seeking health care services in households whose heads believe in traditional healers or in apostolic sect religion. The variable will be categorised as follows: traditional beliefs = 0; apostolic sect = 1; other christian churches = 3 and others religions\(^{15} = 4.\)

**Number of drug types available** (*avail*)

The number of drug types available at the nearest health facility will be used to measure availability of health care services. Studies in developing countries have found a positive effect of availability of drugs on the utilisation of health care services (WHO, 2003). According to Cooper and Ensor (2004), demand for health care services can be supply induced as it can be affected by the availability of drugs. The study will use availability of malaria drugs, pain killers (Paracetamols, Aspirin) and antibiotics to measure availability of health care services. This is because these drug types are basic and they are expected to be available at a rural health facility (MoHCW, 2010). The study expects the probability of seeking treatment from health facilities to increase with more drug types available at the nearest health facility.

### 3.4 Data Sources and Collection

This study used primary data which was collected from households in Bikita District. The survey was carried out in January and February 2013. Data collection was done with the assistance of two trained research assistants. The data collected was based on illness of a

\(^{15}\)All the respondents that do not belong to any of the main categories will be recorded as other religions.
household member within three months prior the survey. The procedure was adopted from the Zimbabwe Demographic Health Survey (ZDHS, 2010).

Data was collected from households using a pre-coded structured questionnaire. Closed-ended questions were used with all possible answers pre-specified and the respondents made their choices from the answers provided. The questionnaire was self-administered. Data collection was done using a face to face personal interview method. This was important because it helped the respondent to understand the questions by interpreting them to fit his or her understanding. Personal interviews have an advantage of making it possible for the interviewer to establish rapport with the respondents and motivating them.

On data quality control, the questionnaire was pre-tested to determine the reliability and validity of the instrument. Pretesting was done before the actual survey to test for the clarity of questions, instructions and to identify any other anomalies in the questionnaire. Necessary adjustments were done after pretesting.

### 3.5 Sample size and sampling procedure

The study area is divided into 32 wards and these wards were taken as clusters. Due to resources and time constraints, the study used one stage cluster sampling to only select 15 wards for the survey. Out of these 15 wards, 250 households were randomly selected and interviewed. Although the study is based on illness, in which data for only households that had experienced illness will be used for regression analysis (Mwabu et al., 1993), at least 10 households were interviewed at ward level. One of the advantages of using cluster sampling as a probability sampling design is that the cost of data collection is very low and it offers a generalisability of the population (Sekaran and Bougie, 2004).

### 3.6 Diagnostic Tests

The study will carry out the following tests:

**Multicollinearity Test**

To check linear dependence between explanatory variables, a correlation test will be carried out. A correlation matrix will be computed. The rule of thumb is that variables will be corrected if the correlation coefficient is 0.8 or above. If explanatory variables are correlated, 16See appendix h for questionnaire.
then there is a problem of multicollinearity and this may result in biased results. To solve this problem, one of the variables is dropped.

**Specification Test**

The Ramsey Regression Equation Specification Error test (RESET) for misspecification will be carried out. The test detects omitted variables and incorrect functional form of the model (Ramsey, 1969). The mechanics of the test is that, if non-linear combinations of the explanatory variables have any power in explaining the dependent variable, then the problem of misspecification exists. If the model can be significantly improved by artificially including powers of the predictions of the model, then the original model must have been inadequate.

**3.7 Conclusion**

This chapter presented the research methodology which will be used to examine empirically the determinants of demand for health care services. The estimation and presentation of results will appear in the next chapter.
CHAPTER FOUR

ESTIMATION, PRESENTATION AND INTERPRETATION OF RESULTS

4.0 Introduction

The purpose of this study is to find the determinants of demand for health care services in rural Zimbabwe using household data from Bikita District. This chapter focuses on the estimation, presentation and interpretation of empirical findings. The chapter starts by a presentation of descriptive characteristics of the households followed by the econometric results. STATA version 11 has been used during estimation. For regression analysis, only data for 176 households was used to find the determinants of demand for health care services\textsuperscript{17}.

4.1 Descriptive statistics

From a sample of 250 households 176 households had reported having at least one sick member within the last 3 months before the survey and this represents 70\% of the interviewed households. The table below shows the descriptive characteristics of 176 households.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of household head</td>
<td>43.31818</td>
<td>11.79786</td>
</tr>
<tr>
<td>Household size</td>
<td>5.556818</td>
<td>2.331594</td>
</tr>
<tr>
<td>Household income</td>
<td>54.27273</td>
<td>61.83799</td>
</tr>
<tr>
<td>Distance</td>
<td>5.903409</td>
<td>2.331594</td>
</tr>
<tr>
<td>Consultation fees</td>
<td>1.369318</td>
<td>1.640548</td>
</tr>
</tbody>
</table>

The table above shows that on average, the age of the household head was 43 years. The average household size and average household income were approximately 6 people and US$54.27, respectively. Average distance to the nearest health centre was approximately 5.9 kilometres while the average consultation fee paid at the nearest health facility was US$1.36. The mean household income as shown in the table above is less than the national average

\textsuperscript{17}Full data set was only available for the 176 households that reported an illness of a household member.
household income of US$85 found by Zimbabwe Vulnerability Assessment committee (ZIMVAC) in 2012. These results may reflect poor economic status of rural households and this may affect access to health care services.

Table 3: Distribution of the households by sex of the household head

<table>
<thead>
<tr>
<th>Sex of household head</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>94</td>
<td>53.41</td>
</tr>
<tr>
<td>Female</td>
<td>82</td>
<td>46.59</td>
</tr>
<tr>
<td>Total</td>
<td>176</td>
<td>100.00</td>
</tr>
</tbody>
</table>

The descriptive statistics results show that out of 146 male headed households that were interviewed, 94 households had experienced at least one sick member in the last three months before the survey. On the other side, out of 104 female headed households that were interviewed, 82 households had illness of a household member. The table above shows that out of the 176 households that reported illness of a member, male headed and female headed households were represented by 53.49% and 46.59%, respectively.

Table 4: Distribution of the households by education of the household head

<table>
<thead>
<tr>
<th>Education</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No education</td>
<td>13</td>
<td>7.39</td>
</tr>
<tr>
<td>Primary education</td>
<td>55</td>
<td>31.25</td>
</tr>
<tr>
<td>Secondary education</td>
<td>77</td>
<td>43.75</td>
</tr>
<tr>
<td>Tertiary education</td>
<td>31</td>
<td>17.61</td>
</tr>
<tr>
<td>Total</td>
<td>176</td>
<td>100.00</td>
</tr>
</tbody>
</table>

The results in table 3 show the distribution of the 176 households that reported having illness of a member by the level of education attained by the household head. Most of the household heads had attained secondary level education represented by 43.75% of the total households followed by primary level education with a representation of 31.25% of the 176 households. The households whose heads reported having no education constituted about 7.39%. These results suggest that the literacy rate in the area is generally high. The descriptive statistics

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18 See appendix b for descriptive statistics for 250 households interviewed.
results also indicate that the rate of reporting illness of a member appears to be higher in households whose heads have attained at least secondary education level. These results may not be interpreted to imply that households with educated heads are likely to have more illness as compared to households whose heads are less educated. Rather, the results may indicate that level of awareness of symptoms of diseases is likely to be high among the more educated household heads than the less educated one. The less educated household heads may have more illness prevalence in their households but fail to report it due to lack of knowledge.

Table 5: Distribution of the households by religion of household head

<table>
<thead>
<tr>
<th>Religion</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>8</td>
<td>4.55</td>
</tr>
<tr>
<td>Apostolic sect churches</td>
<td>27</td>
<td>15.34</td>
</tr>
<tr>
<td>Other christians</td>
<td>113</td>
<td>64.20</td>
</tr>
<tr>
<td>Other religions</td>
<td>28</td>
<td>15.91</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>176</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

The table above shows that out of 176 households that reported illness of a member, most households were headed by heads who were non- apostolic followers. This is shown by 64.20% of households under other christian category. Apostolic sect churches were represented by a percentage distribution of 15.34%. The results further show that the traditional beliefs category was the least represented as indicated by only 4.55% of the 176 households, followed by apostolic sect religion with 15.34% representation. The distribution of the 250 households that have been interviewed by religion and traditional beliefs is given in appendix b.

Table 6: Distribution of households by demand for health care services

<table>
<thead>
<tr>
<th>Demand for Health Care Services</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-treatment</td>
<td>70</td>
<td>39.77</td>
</tr>
<tr>
<td>Clinic / Hospital treatment</td>
<td>106</td>
<td>60.23</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>176</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
Out of 176 households that reported illness of a household member, approximately 60% of household heads acknowledged that health care services were sought while about 40% reported that self-treatment was sought. The results are consistent with other studies in developing countries. In Tanzania, Fredrickx (1998) found out 66% of the sampled rural households sought treatment from health care facilities while 34% resorted to self-treatment. The study by Lawson (2004) in Uganda found out approximately 70% of the sick individuals sought formal health care while about 30% used self-treatment.

Table 7: Relationship between household sex and the demand for health care services

<table>
<thead>
<tr>
<th>Household head sex</th>
<th>Self-treatment</th>
<th>Clinic / Hospital treatment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>50</td>
<td>44</td>
<td>94</td>
</tr>
<tr>
<td>Female</td>
<td>56</td>
<td>26</td>
<td>82</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>70</td>
<td>176</td>
</tr>
</tbody>
</table>

The results shown above indicate that from 94 male headed households that responded having experienced illness of a member, health care services were sought in 44 households while self-treatment was reported to be used in 50 households. From 82 female headed households, 56 household heads responded that self-treatment was used while 26 household heads acknowledged that the sick household member visited a health care facility. The descriptive statistics results show that health care services appear to have been sought more in households headed by males than in households headed by females. The results appear to be contrary to the little empirical evidence which suggests that in female headed households, seeking of health care services is higher than in households headed by males. Studies have found the influence of sex of the household head to be inconclusive.
Table 8: Relationship between severity of illness and demand for health care services

<table>
<thead>
<tr>
<th>Severity of illness</th>
<th>Health care demand</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self-treatment</td>
<td>Clinic / hospital treatment</td>
<td>Total</td>
</tr>
<tr>
<td>Not bedridden</td>
<td>61</td>
<td>23</td>
<td>84</td>
</tr>
<tr>
<td>Bedridden</td>
<td>9</td>
<td>83</td>
<td>92</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>106</td>
<td>176</td>
</tr>
</tbody>
</table>

The household heads who had experienced illness of a household member responded on the severity of the illness. Among the 176 household heads, 84 reported that the member was not bedridden before being attended to. This represents 47.73% of the households that experienced illness of a member in the last three months before the survey. Household members were bedridden before being attended to in 92 households. Out of 84 households in which members were not bedridden, health care services were sought in 23 households while self-treatment was sought in 61 households. From 92 households in which members were bedridden, self-treatment was sought in 9 households. The results from the table above show that as the illness is perceived to be severe, the chances of a member seeking health care services appear to be high.

Table 9: Relationship between education of household head and demand for health care services

<table>
<thead>
<tr>
<th>Education</th>
<th>Health care demand</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self-treatment</td>
<td>Clinic / hospital treatment</td>
<td>Total</td>
</tr>
<tr>
<td>No education</td>
<td>13</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>Primary education</td>
<td>35</td>
<td>20</td>
<td>55</td>
</tr>
<tr>
<td>Secondary education</td>
<td>16</td>
<td>61</td>
<td>77</td>
</tr>
<tr>
<td>Tertiary education</td>
<td>6</td>
<td>25</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>106</td>
<td>176</td>
</tr>
</tbody>
</table>

The table above shows the relationship between the education level attained by the household head and demand for health care services by a household member. Health care services were not sought in all the 13 households whose heads had no education at all. The descriptive results show that education of the household head appears to positively influence seeking of
health care services by a household member. From the results, more treatment from a health facility is sought when the household head has at least primary education.

**Table 10: Relationship between religion and demand for health care services**

<table>
<thead>
<tr>
<th>Religion</th>
<th>Self-treatment</th>
<th>Clinic/hospital treatment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>5</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Apostolic sect</td>
<td>19</td>
<td>8</td>
<td>27</td>
</tr>
<tr>
<td>Other Christians</td>
<td>26</td>
<td>87</td>
<td>113</td>
</tr>
<tr>
<td>Other religions</td>
<td>20</td>
<td>8</td>
<td>28</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>70</strong></td>
<td><strong>106</strong></td>
<td><strong>176</strong></td>
</tr>
</tbody>
</table>

The table above presents the results of a cross tabulation between religion and demand for health care services. From the 113 households whose heads were categorised under other christian churches, household members sought health care services and self-treatment in 87 and 26 households, respectively. Out of 27 households headed by apostolic sect members, self-treatment was sought in 19 households and health care services were sought in 8 households. On the other side, from the 8 households whose heads were categorised under the traditional beliefs, treatment was sought from health facilities in 3 households.

**Table 11: Relationship between access to VHW and demand for health care services**

<table>
<thead>
<tr>
<th>Access to VHW</th>
<th>Self-treatment</th>
<th>Clinic / Hospital treatment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No access to VHW</td>
<td>36</td>
<td>41</td>
<td>77</td>
</tr>
<tr>
<td>Access to VHW</td>
<td>34</td>
<td>65</td>
<td>99</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>70</strong></td>
<td><strong>106</strong></td>
<td><strong>176</strong></td>
</tr>
</tbody>
</table>

The results of the table above shows that out of 176 households that experienced having illness of a member, 99 households had access to village health workers while 77 had no access to village health workers. Out of 77 households that had no access to village health workers, self-treatment was sought in 36 households and health care services were sought in 41 households. From the 99 households that had access to village health workers, members
sought health care services and self-treatment in 65 and 34 households, respectively. From these results, there appear to be no influence of access to village health workers on the seeking of treatment from health facilities.

Table 12: Relationship between number of drugs types available and demand for health care services

<table>
<thead>
<tr>
<th>Number of drugs types</th>
<th>Self-treatment</th>
<th>Clinic/hospital treatment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No single drug type</td>
<td>28</td>
<td>26</td>
<td>54</td>
</tr>
<tr>
<td>One drug type</td>
<td>36</td>
<td>57</td>
<td>93</td>
</tr>
<tr>
<td>Two drugs types or more</td>
<td>6</td>
<td>23</td>
<td>29</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>70</strong></td>
<td><strong>106</strong></td>
<td><strong>176</strong></td>
</tr>
</tbody>
</table>

The results of the table above show a cross tabulation between number of drugs types available and demand for health care services. From the 176 households that had experienced illness of a household member, 54 household heads responded that health care facilities had none of drug types while 29 household heads reported that health facilities had 2 or more drug types available. From the 54 household heads who responded that health facilities had none of the drug types available, 28 of them reported that the household member sought self-treatment. More so, the results show that among the 29 household heads who acknowledged that more than two drugs types were available, 23 household heads reported that household members sought treatment from health facilities. Descriptive statistics results show that the numbers of drugs types available appear to positively influence the likelihood of seeking health care services.

Relationship between distance and demand for health care services

The average distance for households in which health care services were not sought was approximately 7.6 kilometres while it was 4.8 kilometres for households in which self-treatment was sought. The results suggest that distance could be one of the possible factors influencing the demand for health care services in rural areas.
4.1.1 Multicollinearity test

A Pearson’s correlation test was carried out for all the variables. Variables are correlated if the correlation statistic is more than 0.8 or less than -0.8. The results of the test showed that there was low correlation among explanatory variables. From the correlation matrix\(^{19}\), \(age\) and \(agesqr\) were the only variables with a correlation statistic of 0.9888 which was outside the range of \(\pm 0.8\). To solve this, two separate models were estimated, one with \(age\) and the one with \(agesqr\). Although both variables were not significant, the unrestricted model with \(age\) was the most appropriate after carrying out other tests.

4.1.2 Reset test

The Ramsey regression Error Specification (RESET) shows no evidence of model misspecification. The Chi – squared statistic for the test is 0.12 with the p- value of 0.7246. The p- value was statistically significant at 5 \% level and the null hypothesis that the model was correctly specified was accepted (see appendix f).

4.1.3 Heteroskedasticity test

A heteroskedasticity test was performed to check if variances of error terms were homoskedastic. A chi –square test statistic of 1.83 was obtained with p- value of 0.1764. At 5\% level of significance, we failed to reject the null hypothesis and hence there was no evidence of heteroskedasticity\(^{20}\).

4.2 Discussion of the econometric results (Unrestricted Logit model)

The results of the estimated unrestricted logit model\(^ {21}\) showed that sex of household head, age of household head, religion, consultation fees and access to village health workers were insignificant at all the conventional significance levels of 1\%, 5\% and 10\%. These variables were therefore dropped one by one and another regression (restricted model) was estimated. The restricted regression showed that severity of illness, education of household head, household income, distance to the nearest health facility, household size and number of drugs types available were significant variables in the study.

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\(^{19}\) See a correlation matrix for all explanatory variables in appendix b

\(^{20}\) See appendix g for the hettest print out results.

\(^{21}\) See appendix d for STATA print out results on Unrestricted model
4.3 Presentation of Restricted Logit results

The table below summarises the logit results after dropping insignificant variables in the first estimation. All the variables in the restricted model are significant either at 1%, 5% or 10% level of significance.

Table 13: Logistic Model (restricted)

| DEM  | Coef.   | Std. Err | Z    | P >|z| | [95 % Conf. Interval ] |
|------|---------|----------|------|-----|------------------------|
| sever | 2.440614*** | 0.6740351 | 3.62 | 0.000 | 1.11953 | 3.761699 |
| avail | 0.8680902*  | 0.4855423 | 1.79 | 0.074 | -0.0835552 | 1.819736 |
| dist  | 0.9127408**** | 0.2109832 | -4.33 | 0.000 | -1.32626 | -0.4992213 |
| heduc | 1.04432***   | 0.4066408 | 2.57 | 0.010 | 0.2473186 | 1.841321 |
| hinc  | 0.0199479*   | 0.0112023 | 1.78 | 0.075 | -0.0020082 | 0.0419039 |
| hsize | -0.4651919** | 0.1860196 | -2.50 | 0.012 | -0.8297837 | -0.1006001 |
| _cons | 4.499179**   | 1.760959  | 2.55 | 0.011 | 1.047764 | 7.950595 |

***Significant at 1% level of significance. **Significant at 5% level of significance. * Significant at 10% level of significance.

Number of observations

This is the number of observations used in the logit model regression. This study used 176 observations as indicated in table 13 above.
**Log likelihood**

This is the log likelihood of the fitted model. It is used in the Likelihood Ratio Chi-Square test of whether all predictor’s regression coefficients in the model used are simultaneously zero. The results show that the model converged and iterations stopped where the Log likelihood was equivalent to -36.685014 which is close to 0. This shows that the model is appropriate for the study.

**LR chi2 (7)**

This is the likelihood ratio (LR) chi-square test that at least one of the predictor’s regression coefficients is not equal to zero. The model has a chi-square statistic of 163.20 with number in parenthesis indicating the number of degrees of freedom. In this model they are six predictors and therefore there are six degrees of freedom.

**Prob>chi2**

This is the probability of obtaining the chi-square of 163.20 given that the null hypothesis that all the regression coefficients in the model are equal to zero, that is if in fact there is no effect of independent variables. The p –value of the statistic is 0.0000 and this is significant at 1 %. This means that at least one of the regression coefficients in the model is not equal to zero.

**Pseudo R2**

This is McFadden’s pseudo R-squared which measures the model’s goodness of fit and it was found to be 0.6899. This is high and this means that the model correctly predicts each observation.
4.4 Marginal effects results

The marginal effects were computed to give the magnitude of the effects of changes in the explanatory variables on the dependent variable. The results are summarised in the table below.

Table 14: Marginal effects after Logit

<table>
<thead>
<tr>
<th>Variable</th>
<th>dy/dx</th>
<th>Std. Err.</th>
<th>Z</th>
<th>P &gt;</th>
<th>z</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>sever*</td>
<td>0.393693</td>
<td>0.11318</td>
<td>3.48</td>
<td>0.001</td>
<td>0.522727</td>
<td></td>
</tr>
<tr>
<td>avail</td>
<td>0.1360019</td>
<td>0.07727</td>
<td>1.76</td>
<td>0.078</td>
<td>0.857955</td>
<td></td>
</tr>
<tr>
<td>dist</td>
<td>-0.1429972</td>
<td>0.03854</td>
<td>-3.71</td>
<td>0.000</td>
<td>5.90341</td>
<td></td>
</tr>
<tr>
<td>heduc</td>
<td>0.1636114</td>
<td>0.06991</td>
<td>2.34</td>
<td>0.019</td>
<td>1.71591</td>
<td></td>
</tr>
<tr>
<td>hinc</td>
<td>0.0031252</td>
<td>0.00153</td>
<td>2.05</td>
<td>0.041</td>
<td>54.2727</td>
<td></td>
</tr>
<tr>
<td>hsize</td>
<td>-0.0728806</td>
<td>0.03274</td>
<td>-2.23</td>
<td>0.026</td>
<td>5.55682</td>
<td></td>
</tr>
</tbody>
</table>

(*) dy/dx is for discrete change of dummy variable from 0 to 1

4.5 Discussion of marginal effects results

Severity of illness

The variable has a p-value of 0.001 which means it is statistically significant at 1 % level of significance. The coefficient of the variable is positive to show that as the household member is bedridden due to illness, the chances of seeking health care services are high. From marginal effects results, being bedridden before being attended increases the probability of seeking health care services by 0.394. When illness of the household member is perceived to be severe, it means the illness may require going to hospital or clinic rather than seeking self-treatment. From the households in which illness of the member is not severe, the predicted probability of seeking health care services is 0.5574 while it is 0.8299 when the illness of the household member is perceived to be severe. The results are consistent with a study by Flores et al., (2001) in Mexico who found out that perception of the seriousness of illness was a significant variable in determining the demand for health care services.

22 See appendix c for the predicted probabilities.
Number of drug types available

The coefficient is statistically significant at 10% level of significance and this shows that the variable is significant in influencing the demand for health care services. The positive coefficient implies that the more the number of drug types available at the nearest health facility, the higher the chances of seeking health care services. The results of the study suggest that seeking of health care services in rural areas may be supply induced as found by Cooper and Ensor (2004). The results confirm the fact that most clinics in rural areas operate with inadequate supply of basic drugs serve for hospitals. The predicted probabilities of 0.6345, 0.8336 and 0.9353 represent none, one drug type and two or more drug types available, respectively. The results of the predicted probabilities show that the probabilities of seeking health care services increase with the number of drug types available at the nearest health facility.

Distance to the nearest health facility

This variable is statistically significant at 1% level of significance. The results show an unsurprising negative relationship between distance to the nearest health care facility and the demand for health care services. The relationship shows that households who live far away from the health care facilities have a higher probability of not seeking health care services than those who stay close to health facilities. The marginal effects results show that an extra kilometre to the nearest health care facility reduces the probability of seeking health care services by approximately 0.143. There are a number of previous studies that have found similar results. For example, a study by Hutchinson (1999) in Uganda found out that distance negatively reduces the physical accessibility to health care services. A further distance away from the nearest health care facility suggests that people have to incur costs to access health care services in the community. These costs include transportation costs. As a result, poor families may rely on self-treatment. Distance is viewed as one of major barriers to health care services utilisation in rural areas as compared in urban areas.

Education of household head

The variable, heduc is statistically significant at 5% level of significance. The sign of the coefficient shows that there is a positive relationship between the demand for health care services and education of the household head. The results confirm the predictions of Grossman’s model in which education is found to positively influence the demand for health and health care. The results could be also explained by the evidence from empirical literature.
that better schooling or education of the household head has a potential to improve understanding and appreciation of benefits of seeking health care services. The predicted probabilities representing no education, primary, secondary and tertiary categories are 0.4045, 0.6660, 0, 8541 and 0.9353. The results of the predicted probabilities show that as education of the household head increases, the higher chances of seeking health care services by a household member.

**Household income**

The coefficient of this variable is statistically significant at 10% level of significance. The results show that monthly household income has a positive relationship with demand for health care services. The results show that a unit increase in household income increases the probability of seeking health care services by 0.0031. The study confirmed the positive influence of income on health care demand as predicted by Grossman (1972). According to Fredrikx (1998), rural households are constrained by low levels of income to seek treatment from health facilities as access to health care services includes both direct and indirect costs.

**Household size**

The coefficient of the variable is statistically significant at 5% as shown by the p-value of 0.026. This means that the variable is important in influencing the demand for health care services. The results show that there is a negative relationship between size of the household and the demand for health care services. An additional household member reduces the probability of seeking health care services by approximately 0.073. As expected, health care services are more likely to be sought in households with fewer members than in households with more members. The results reflect poverty related issues in rural areas where the poor households tend to have more members and consequently, household members are resource constrained to seek health care services. Rather, they opt for self-treatment (Kaija and Okwi, 2004). Muhofah (2010) also found the negative relationship between household size and the utilisation of health care services in rural Uganda.

**4.6 Conclusion**

The econometric results show that, severity of illness, education of household head, household income, household size, distance to the nearest health facility and numbers of drugs types available are significant factors that determine the demand for health care services in rural areas. However, the study has found out that age of household head, sex of household
head, consultation fees, access to village health workers and religion are insignificant variables. The results show that consultation fees have no effect on the demand for health care services (probability of seeking treatment from health care facilities) could be justified because consultation fees exclude the other costs such as cost of buying drugs. In rural health facilities, especially at hospitals, patients pay for drugs which they are prescribed and the costs vary with the type of prescription. A study by Kaija and Okwi (2004) in rural Uganda found that consultation fees were insignificant in explaining health care services utilisation. Although consultation fees were not statistically significant in the study, the sign was as expected. The positive effect and statistical significance of the household income on the probability of seeking health care services suggests that people face direct and indirect costs of accessing health care services.
CHAPTER FIVE

CONCLUSIONS AND POLICY RECOMMENDATIONS

5.0 Introduction

This chapter presents a summary and conclusion of the study’s findings. The chapter also provides policy implications and recommendations derived from the findings. Limitations of the study and areas for further research will be discussed in the last section of the chapter.

5.1 Summary of main findings

The study investigated the determinants of demand for health care services in rural Zimbabwe using the case of Bikita District. The study was stimulated by the desire to establish factors which are influencing seeking of health care services especially the influence of socio economic and institutional factors. Utilisation of health care services in rural areas has remained low despite efforts by the government to improve utilisation of health care services.

The study used cross sectional household data that was collected in January and February, 2013. Data was collected from households based on illness. A self-administered questionnaire was used in the collection of data. The study used a binary dependent variable and a value of one was assigned if a household member sought treatment from a clinic or hospital and zero in the case when the household member sought self-treatment in managing illness. A set of socio demographic, economic and institutional variables were used as independent variables. These variables were: age of the household head, sex of household head, household size, education of household head, religion, household income, severity of illness, distance to the nearest health care facility, consultation fees, number of drug types available and access to village health workers. A logit model was then used to find the determinants of demand for health care services. The regression results revealed the importance of severity of illness, education of household head, household income, household size, distance to the nearest health care facility and number of drug types available to have a significant statistical relationship with the demand for health care services. In the study, household income, education of household head, number of drug types available and severity of illness had positive influence on the demand for health care services. On the contrary side, distance and household size had an inverse relationship with the demand for health care services (probability of seeking treatment from health facilities). However, the results of the study reveal no significant relationship between age of household head, sex of the household head, religion, access to village health workers and consultation fees and the probabilities of seeking health care serv.
All the hypotheses for insignificant variables were rejected while the hypotheses for significant variables were accepted.

5.2 Policy Implications and Recommendations

There are several policy insights that can be derived from the empirical findings of this study. From the results of the study, distance is one of the factors that decrease the probability of seeking health care services. Therefore, the policy implication of this finding is that policies that aim to reduce distance to the nearest health care facility are likely to increase the probability of seeking health care services. In light of the above, policy makers should implement policy interventions that aim to shorten the distance which rural people travel to access health care services. Such interventions include increasing the number of health care facilities in the rural areas. This can be done by introducing community based mobile clinics.

The positive significant effect of household income on demand for health care services suggests that policies that aim to increase household income are likely to increase health care service utilisation and reduce chances of self-treatment. From these results, more income generating projects should be implemented to improve rural household incomes. Higher household income can improve the chances of seeking health care services in rural areas because there are direct and indirect costs of accessing health care services.

The study has also found a negative significant relationship between household size and the probability of seeking health care services. The results imply that measures that aim to reduce household size may have positive influence on the demand for health care services. The rural households need more awareness on use of family planning methods so as to reduce family size. The smaller the household size, the less household members are resource constrained to access health care services.

Furthermore, regression results of the study indicate that availability of drugs positively influences the demand for health care services as shown by increasing predicted probabilities as more drug types are available. These results imply that government measures that aim to increase availability of drugs may increase utilisation of health care services and lower the likelihood of using self-treatment. Hence, the government should increase its funding to health facilities to ensure availability of drugs particularly basic ones.

Lastly, the study has found positive significant relationship between education of household head and demand for health care services. In this regard, policies that promote universal
education should be maintained by policy makers in order to improve seeking of health care services in rural areas. If a household head is more educated, he or she understand the benefits and importance of seeking formal health care services in the case of illness of household member.

5.3 Limitations of the Study and Areas for further Research

Due to time and financial constraints, the study only used 176 households to draw conclusions on the factors which influence demand for health care services. Given the availability of sufficient resources, data from more households from the district can be used in future studies to make rich conclusions. Furthermore, the scope of study was limited to Bikita District in Masvingo Province. Thus, more conclusive results on the factors which influence demand for health care services in rural Zimbabwe can be found if similar studies are done in other rural districts of Zimbabwe.
BIBLIOGRAPHY


Ministry of Economic Planning and Investment Promotion (2010), Medium Term Plan, 2010-2015.


www. Wikipedia.org

www.mohcw.co.zw.


APPENDICES

Appendix a: Correlation matrices

Stata 11 command: correlate dem acvhw sever hsize hsex heduc dist age hinc relig userf avail agea gesqr

<table>
<thead>
<tr>
<th></th>
<th>DEM</th>
<th>acvhw</th>
<th>Sever</th>
<th>hsize</th>
<th>hsex</th>
<th>heduc</th>
<th>hist</th>
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<tbody>
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<td>-0.2377</td>
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<td>0.2692</td>
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<table>
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<tr>
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<th>relig</th>
<th>userf</th>
<th>avail</th>
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### Appendix b: Descriptive statistics for 250 households

#### Distribution of 250 households by continuous variables

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<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
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<tr>
<td>Age of household head</td>
<td>43.424</td>
<td>11.29471</td>
</tr>
<tr>
<td>Household size</td>
<td>5.364</td>
<td>2.017868</td>
</tr>
<tr>
<td>Household income</td>
<td>59.624</td>
<td>66.94134</td>
</tr>
</tbody>
</table>

#### Distribution of 250 households by sex of household head

<table>
<thead>
<tr>
<th>Sex of household head</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>146</td>
<td>58.40</td>
</tr>
<tr>
<td>Female</td>
<td>104</td>
<td>41.60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>250</strong></td>
<td><strong>100.00</strong></td>
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</tbody>
</table>

#### Distribution of 250 households by education of household head

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<thead>
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<th>Education</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>No education</td>
<td>39</td>
<td>15.60</td>
</tr>
<tr>
<td>Primary education</td>
<td>86</td>
<td>34.40</td>
</tr>
<tr>
<td>Secondary education</td>
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<td>34.00</td>
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<td>Tertiary education</td>
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<tr>
<td><strong>Total</strong></td>
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<td><strong>100.00</strong></td>
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#### Distribution of 250 households by religion and traditional beliefs

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<th>Religion</th>
<th>Frequency</th>
<th>Percent</th>
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<tbody>
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<td>Traditional</td>
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<td>8.40</td>
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<tr>
<td>Apostolic sect</td>
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<td>15.60</td>
</tr>
<tr>
<td>Other Christians</td>
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<td>64.80</td>
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<td>Other religions</td>
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<td><strong>Total</strong></td>
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<td><strong>100.00</strong></td>
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## Appendix c: Predicted probabilities

Command used in Stata 11 – prtab variable

### Table 16: Predicted Probabilities.

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<th>Prediction</th>
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<td>0.4045</td>
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<td>0.6660</td>
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<tr>
<td>2</td>
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<td>3</td>
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<tr>
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<td>0</td>
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</tr>
<tr>
<td>1</td>
<td>0.8336</td>
</tr>
<tr>
<td>2</td>
<td>0.9353</td>
</tr>
</tbody>
</table>
Appendix d: Estimation of Unrestricted Logit results (STATA print out)

.logit dem acvhw sever hsize hsex heduc dist age hinc relig userf avail

Iteration 0:  log likelihood = -118.28597
Iteration 1:  log likelihood = -39.42778
Iteration 2:  log likelihood = -34.320856
Iteration 3:  log likelihood = -33.568261
Iteration 4:  log likelihood = -33.558236
Iteration 5:  log likelihood = -33.558235

Logistic regression
Number of obs = 176
LR chi2(11) = 169.46
Prob > chi2 = 0.0000
Log likelihood = -33.558235
Pseudo R2 = 0.7163

|     | Coef.  | Std. Err. |    z  | P>|z|  |   [95% Conf. Interval]   |
|-----|--------|-----------|-------|-------|--------------------------|
| dem |        |           |       |       |                          |
| acvhw | 0.709284 | 0.6876646 | 1.03  | 0.302 | -0.6385137               | 2.057082 |
| sever | 2.354158 | 0.8063792 | 2.92  | 0.004 | 0.7736833               | 3.934632 |
| hsize | -0.4045703 | 0.2025392 | -2.00 | 0.046 | -0.8015399              | -0.0076007 |
| hsex  | -1.838876 | 0.7483123 | -2.50 | 0.012 | -1.650553               | 1.282778 |
| heduc | 1.076919 | 0.4634425 | 2.32  | 0.020 | 0.1685884               | 1.98525  |
| dist  | -0.8640563 | 0.2311917 | -3.74 | 0.000 | -1.317184              | -0.4109288 |
| age   | -0.0301355 | 0.0290896 | -1.04 | 0.300 | -0.08715               | 0.0268791 |
| hinc  | 0.0218461 | 0.0131528 | 1.66  | 0.097 | 0.003933               | 0.0476251 |
| relig | 0.4420956 | 0.4735076 | 0.93  | 0.350 | -0.4859623             | 1.370154 |
| userf | -0.2385711 | 0.2498481 | -0.95 | 0.340 | -0.7282643            | 0.2511221 |
| avail | 1.059852 | 0.5923254 | 1.79  | 0.074 | -0.1010845             | 2.220789 |
| _cons | 4.108904 | 2.451041  | 1.68  | 0.094 | -0.6950475             | 8.912855 |
Appendix e: Estimation of Restricted Logit results (STATA print out)

```
.logit dem sever avail dist heduc hinc hsize
```

Iteration 0: log likelihood = -118.28597
Iteration 1: log likelihood = -43.171271
Iteration 2: log likelihood = -37.369676
Iteration 3: log likelihood = -36.692878
Iteration 4: log likelihood = -36.685021
Iteration 5: log likelihood = -36.685014
Iteration 6: log likelihood = -36.685014

Logistic regression

```
Number of obs = 176
LR chi2(6) = 163.20
Prob > chi2 = 0.0000
```

Log likelihood = -36.685014

```
Pseudo R2 = 0.6899
```

|    | Coef. | Std. Err. | z  | P>|z| | [95% Conf. Interval] |
|----|-------|-----------|----|------|----------------------|
| dem |       |           |    |      |                      |
| sever |2.440614 | .6740351 | 3.62 | 0.000 | 1.11953 to 3.761699 |
| avail | .8680902 | .4855423 | 1.79 | 0.074 | -.0835552 to 1.819736 |
| dist  | -.9127408 | .2109832 | -4.33 | 0.000 | -1.32626 to -.4992213 |
| heduc | 1.04432 | .4066408 | 2.57 | 0.010 | .2473186 to 1.841321 |
| hinc  | .0199479 | .0112023 | 1.78 | 0.075 | -.0020082 to .0419039 |
| hsize | -.4651919 | .1860196 | -2.50 | 0.012 | -.8297837 to -.1006001 |
| _cons | 4.499179 | 1.760959 | 2.55 | 0.011 | 1.047764 to 7.950595 |

Estimation of Marginal effects results

```
mfx
```

Marginal effects after logit

```
y = Pr(dem) (predict) = .80550298
```

```
| variable | dy/dx | Std. Err. | z  | P>|z| | [95% C.I. ] | X |
|----------|-------|-----------|----|------|-------------|---|
| sever*   | .393693 | .11318 | 3.48 | 0.001 | .171859 to .615527 | .522727 |
| avail    | .1360019 | .07727 | 1.76 | 0.078 | -.015448 to .287452 | .857955 |
| dist     | -.1429972 | .03854 | -3.71 | 0.000 | -.218536 to -.067459 | 5.90341 |
| heduc    | .1636114 | .06991 | 2.34 | 0.019 | .026583 to .30064 | 1.71591 |
| hinc     | .0031252 | .00153 | 2.05 | 0.041 | .000134 to .006116 | 54.2727 |
| hsize    | -.0728806 | .03274 | -2.23 | 0.026 | -.137054 to -.008707 | 5.55682 |
```

(*) dy/dx is for discrete change of dummy variable from 0 to 1
Appendix f: Reset Test results

Command used in Stata for the RESET test

. predict yf, xb

. gen yf2=yf\^2

. quietly logit acvhw sever hsize hsex heduc dist age hinc relig user availyf2

. test yf2=0

( 1) yf2 = 0

Result

Chi 2(1) = 0.12

Prob> chi2 = 0.7246
Appendix g: Heteroskedasticity test

\texttt{regress dem acvhw sever hsize hsex heduc dist age hinc relig userf avail}

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>Number of obs = 176</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>28.4603417</td>
<td>11</td>
<td>2.58730379</td>
<td>F( 11, 164) = 30.97</td>
</tr>
<tr>
<td>Residual</td>
<td>13.6987492</td>
<td>164</td>
<td>.083528958</td>
<td>Prob &gt; F = 0.0000</td>
</tr>
<tr>
<td>Total</td>
<td>42.1590909</td>
<td>175</td>
<td>.240909091</td>
<td>R-squared = 0.6751</td>
</tr>
</tbody>
</table>

|        | Coef.    | Std. Err. | t     | P>|t|  | [95% Conf. Interval] |
|--------|----------|-----------|-------|-------|---------------------|
| acvhw  | .0405688 | .0467741  | 0.87  | 0.387 | -.0517882 to .1329259 |
| sever  | .2837029 | .0571112  | 4.97  | 0.000 | .1709349 to .396471  |
| hsize  | -.0546235| .0125956  | -4.34 | 0.000 | -.079494 to -.0297531 |
| hsex   | -.0164006| .0482838  | -0.34 | 0.735 | -.1117386 to .0793737 |
| heduc  | .0793286 | .0300003  | 2.64  | 0.009 | .0209092 to .1385652 |
| dist   | -.0534658| .011312   | -4.73 | 0.000 | -.0758018 to -.0311299 |
| age    | -.0038088| .0020491  | -1.86 | 0.065 | -.0078548 to .0002371 |
| hinc   | .0009057 | .0004227  | 2.14  | 0.034 | .0000711 to .0017403 |
| relig  | .0200056 | .0323112  | 0.62  | 0.537 | -.043794 to .0838052 |
| userf  | -.0354861| .015069   | -2.35 | 0.020 | -.0652404 to -.0057319 |
| avail  | .0768234 | .0347101  | 2.21  | 0.028 | .0082872 to .1453596 |
| _cons  | .9820492 | .1675281  | 5.86  | 0.000 | .6512591 to 1.312839 |

. hetest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of dem

\texttt{chi2(1) = 1.83}
\texttt{Prob > chi2 = 0.1764}
My name is Chiremba Tafara, student number R075024K and I am a final year Masters of Science in Economics student at University of Zimbabwe. I am carrying out a research on the topic entitled “Determinants of demand for health care services in rural Zimbabwe; A case for Bikita District, Masvingo Province”. The purpose of this study is therefore to collect data concerning the utilisation of health care services. The research is for academic purposes and your responses will be kept strictly confidential. Your cooperation will be highly appreciated.

Questionnaire No _______________
Name of the interviewer_________________ Date of interview__________________
Ward ____________ Household number _________ village ____________

Respondent:

SECTION A: HOUSEHOLD CHARACTERISTICS

1. Sex of household head [1] Female □ [0] Male □
2. Age of household head ____________________ Years
3. How many household members are currently staying here? ___________
4. What is the highest level of education attained by the head of the household?
   [0] No education at all __________ [2] Secondary education __________
5. What is the household’s monthly income________________________ US $
6. What is religion of the household head?
   [0] Traditional __________ [1] Apostolic Sect churches __________

SECTION B: ILLNESS AND SEEKING OF HEALTH CARE SERVICES

7. Has any member of the household reported ill within the last three months? [1]YES  [0]NO  

8. If YES to Question 7, was treatment sought from a health care facility? [1]YES  [0]NO  

9. If YES to Question 7, was the member bedridden before being attended to? [1]YES  [0]NO  

SECTION C: INSTITUTIONAL FACTORS

10. Approximately, what is the distance to your nearest health facility? ___________ Km  

11. What is the amount of consultation fees paid at your nearest health facility? ___________ US$  

12. Do you have access to village health workers in your community? [1]YES  [0]NO  

13. From previous visits, are the following drugs available at the nearest health care facility?  
   [1] Pain Killers (Paracetamols, Aspirin) ___________  

*Thank you very much for taking your time to respond to the questions.*