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**Choice of health care services-Case of Budiro 4 High Density Suburbs,
Harare**

By

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**Dissertation Submitted in Partial Fulfillment of the Requirements of
the Master of Science Degree in Economics.**

DEDICATION

I dedicate this dissertation to my better half, Mercy Muneri Kufahakurambwi, my beautiful children Felistas, Coly, Perseverence and Mexin.



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Above all, I would like to give glory to the Creator, Almighty God for the strength He gave me during this course. He also provided resources abundantly for this course to be a success.

ABSTRACT.

The study investigated the factors that determine patients' choice of health care provider in Zimbabwe, using data collected from Budiriro 4 by way of questionnaires. A sample of 150 people who reported having been sick within the last 12 months was collected. A multinomial logistic model was employed, further which marginal effects were calculated. The findings were that being male increases the probability of choosing Private and mission clinics/hospitals and decreases the probability of choosing public facilities and spiritual/ religious providers. As income increases, patients shun spiritual/religious providers and move to demand services from private clinics/hospitals. Increase in household size causes patients to move away from private clinics/hospital and demand services from religious/spiritual healers. Members of the apostolic sect are predisposed to choose spiritual/religious healers and have a lower probability of choosing private clinics/hospitals. Patients suffering from perceived severe illness have a lower probability of choosing public clinics/hospitals. An increase in user fees is associated with an increased probability of choosing private, mission and spiritual healers, a very surprising result. Perceived high quality in private and spiritual providers is associated with an increase probability that they are chosen by patients. The major recommendations were that the government should fully incorporate the private providers, formal and informal, into the system so as to improve access and health care utilization in Zimbabwe. The public provider should avail family discounts to improve access by large families. The government should intensify awareness campaigns to encourage members of apostolic sect to seek formal health care services. The Zimbabwean health system should endeavor to eliminate the impasse that exists between health care funders and provider

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LIST OF ACRONYMS

AIDS.....	Acquired Immune-Deficiency Syndrome
AMEs.....	Average Marginal Effects
GDP.....	Gross Domestic Product
HIV.....	Human Immune-deficiency Virus
LPM.....	Linear Probability Model
MDG.....	Millennium Development Goals
MEMs.....	Marginal Effects at the Means
MOHCC.....	Ministry of Health and Child Care
MLM.....	Multi-nomial Logit Model

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CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.0 Introduction

When people are sick or ill, they may treat themselves or they may seek treatment from the family and relatives. They may consult traditional healers; alternatively they may consult religious healers or physicians. It is hypothesized that health is a pre-condition for good life and development. Most countries especially in the Southern hemisphere have, until recently, been subsidizing health care services (Muriithi, 2013). The economic crises of the late 1990s forced most African economies to introduce user fees, as was prescribed by The Bamako Health Declaration of 1987. However this is thought to have driven away low income patients from institutional health care service providers towards non-formal providers such as self-treatment, traditional and religious healers. Proponents of user fees (the Classicalists) argue that it allows providers to recover cost of provision. However, opponents of user fees (Welfarists) argue that it drives away the poor from formal health care to unorthodox health care. Brodwin (1996) however noted that even without user fees, access to health care services cannot be equal across all people due to other non-economic factors such as religion, politics and cultural beliefs.

Health care provision in Zimbabwe is a blend of both public and private¹ health care providers. Unlike in most developed countries, health care in Zimbabwe is not universally free. Somehow patients have to pay. Because there are multiple health care services providers, patients are bound to make a choice as to where to receive health care services. This choice is likely to be informed by several factors. What then could these factors be? Are they provider or patient driven factors? The patients should know better.

Determining the factors that shape this decision process requires an investigation into this process. Unlike making choices over tangible goods like cars, clothes or a mobile handset, the choice of medical service provider is quite complex since health care is a fundamental good. The choice of health service provider can be the difference between life and death. More-so,

¹ Private health services providers in Zimbabwe include the formal and informal providers. Informal providers include traditional and religious health care providers.

occurrence of sickness or illness is stochastic and the probability of occurrence thereof is even unknown to the patients.

Enumerable effort to determine these factors has since been made especially in developed countries, but results have been inconclusive and conflicting. Similar researches have not been carried out in Zimbabwe to determine what really influences this choice. But it is well known that patients have been, and are still choosing certain providers over others within the Zimbabwean health care system.

1.1 Background

1.1.2 Zimbabwean Post Independence Health Policy Interventions.

Zimbabwe implemented a number of policies and programs to improve health care utilization and to reduce health care access inequalities that existed pre-independence. These include the free health care policy that was passed out in September 1980. This policy was in pursuit of universal health coverage and improvement in health care utilization in the country. The policy made sure that free health care was provided by the government through public health care service centres. However the role of the private sector health care delivery was marginalized as the policy and system hardly accommodated the private sector. The result was that the private sector was not subsidized. This policy however had serious implications on the national budget as the budget for health rose by 5.1 percent in 1981 and by 10 percent in 1982. This was exacerbated by immunization programs that were rolled out in 1982 through the public health care system.

In 1987, the hospitals and health care building program was also implemented. This program led to a massive increase in the number of public health care centres across the country as well as upgrading of provincial hospitals. Some clinics were also upgraded into hospitals. This was a celebrated program especially in rural areas as it made sure there is a public clinic in every rural neighborhood.

In 1991, the Economic Structural Adjustment Program was adopted. This program was not adopted for the health care system's cause per se, but for all the sectors in the economy. The policy pursued austerity measures meant to reduce pressure on the government budget as was recommended by the international monetary institutions. (Zhou and Zvoushe, 2012). This led to

removal of subsidies, privatization of some public health institutions and a move towards a market based health care delivery system. However, health services got so expensive and unaffordable to the generality of the Zimbabwean populace. Low income earners got excluded from the health care market (Ministry of Health and Child Welfare, 1998). This undermined the pursuit of full health care utilization and consequently, access to health care services inequalities grew. There was an incessant transition of demand for health care services away from institutional health care providers towards non-institutional health care providers since most people could not afford to pay for formal health care services.

In 1997, the National Health Strategy (1997-2007) was rolled out to reverse the Economic Structural Adjustment Program induced effects. The National Health Strategy was put forward as a remedy in 1997. It was intended to improve quality and equity in health care delivery (Ministry of Health and Child Welfare, 1998). Inequities in health care provision and access were witnessed during the Economic Structural Adjustment Program, and these ought to be reversed. This strategy incorporated programmes and sub-policies geared towards health care quality and reduction in inequities in health care access. The government was convinced that the private formal sector was not well managed and their prices were unreasonable. This policy sort to address this issue by putting stricter regulations on the private sector. These included a highly regulated operational environment and price controls. However, some private health care providers were closed as they failed to meet some of the regulations put in place. The same policy was re-introduced in 2009, under the name, National Health Strategy (2009-2013), with the same effect. However, from 2013, the government relaxed the regulatory environment and many private firms entered the health care market since then.

1.1.3 Zimbabwe's Health Care System Performance.

Zimbabwe made massive progress during the first decade after independence in promoting access to health care services. The implementation of the Primary Health Care (PHC) program enabled easy access and utilisation of basic health care services to about 85 percent of the population. Zimbabwean health infrastructure and health system fared much better than most African countries. This was partly as a direct consequence of a legacy of health system development before independence in the 1960s and 1970s. By the early 1980s, the Zimbabwean

health care system was hailed as the most comprehensive and efficient in sub-Saharan Africa (Kevany *et al.*, 2012)

The government of Zimbabwe plays a very big role in providing health care services as evidenced by its financial commitments over the years. Zimbabwe's budgetary allocation for the health sector averaged 3.5percent of GDP from 1980 to 2016. However health outcomes remained miserably poorer than the global standards and are generally deteriorating.

Zimbabwe currently faces a number of severe public health threats. Zimbabwe's HIV epidemic is amongst the worst in the world while Tuberculosis and Malaria are widespread. The economic downturn since 1992 did not spared the health system, as a consequence, the health system suffered serious erosion as was evidenced by a deterioration in national health indicators such as life expectancy, infant mortality rates and maternal mortality rates (Osika *et al.*,2011)

Table 1: Zimbabwean Health Indicators trend from 1994 to 2016

Health Indicator	1994	2009	2016
Infant mortality rate	55/ 1000	60/1000	75/1000
Under five mortality rate	77/1000	86/1000	57/1000
Stunting	29percent	35percent	38percent
Maternal mortality rate	725/100000	960/100000	790/100000
Life expectancy	60 Male	43 Male	56 Male
	60 Female	44 Female	58 Female

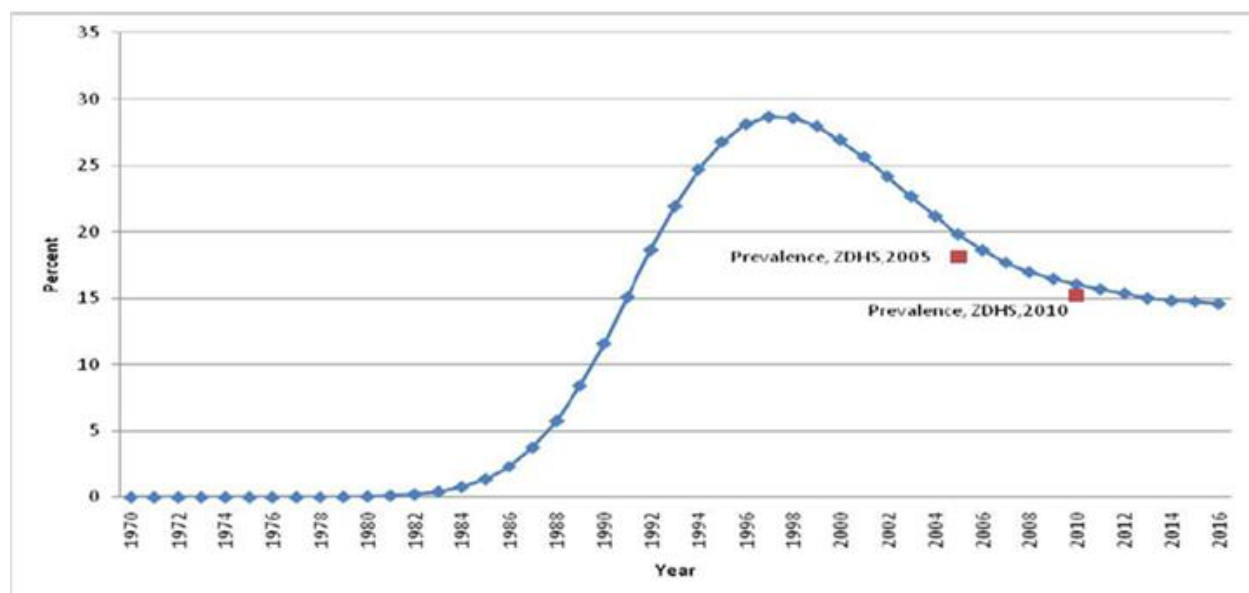
Source: Ministry of Health and Child Care (2017).

The above indicators show a general deterioration in national health over time. Infant mortality rate rose throughout the years from 1994. Life expectancy in 1994 was 60 years (male and female) which fell to 43 and 44 for men and women respectively in 2009. It however rose to 56 and 58, for male and female respectively in 2016 as the economy showed some signs of recovery. This is one of the promising indicators of Zimbabwe's health status. Maternal

mortality ratio (per 100,000 live births) was 790 in 2016 as compared to 725 in 1994. Under five mortality rate rose from 77/1 000 in 1994 to 86/1 000 in 2009. It however fell to 75/1000 in 2006 which still represents deterioration from the 1990s.

One key area that Zimbabwean health system has been commented for is the fight against HIV/AIDS. The HIV/AIDS pandemic of mid 1980s did not spared Zimbabwe. The first decade and a half after the pandemic was terrible. HIV/AIDS prevalence rose to alarming rates as the trend below shows.

Figure 1: Trend in adult HIV/AIDS prevalence -Zimbabwe



Source: World Health Organisation (2016)

There was a sharp rise from nearly zero percent in 1985 to nearly 30 percent in 1999. In this period, all countries in the world faced a similar trend of rising HIV/AIDS prevalence, though it was worse in Africa. From 2000, the prevalence rate started to decline until now. As of 2017, the HIV prevalence rate was 14 percent, as per recently conducted Zimbabwe Population-Based HIV Impact Survey and the trend looks set to continue to decline. The decline in the prevalence has been attributed to successful awareness campaigns and the impact of HIV preventive programs.

It is known that Zimbabwe failed to meet the respective targets of Millennium Development Health Goals number 4, 5 and 6. The maternal mortality rate was 614 per 10 000 live births for the year 2014-15 which was far greater than the MDG 5 target A (5.A); which was to reduce

maternal mortality rate by three-quarters by 2015 (174 per 10 000 for Zimbabwe). The Under 5 mortality rate for the year 2014-15 was 57 per 1000 live births which was still greater than MDG 4 target A (to reduce under 5 mortality rate by two-thirds- that is to 43 per 1 000 for Zimbabwe). More so, Zimbabwe also failed to meet MDG number 6, target A which was: to have halted and begun to reverse the spread of HIV/AIDS by 2015 - Zimbabwe had 40 000 new infections in 2015 (World Health Organisation, 2016).

Overall, there has been persistent erosion of the health care system since independence. From the 1980s to late 1990s, there was also a decline in the health system performance. However, the system performed its all time low from 2000 to 2009 from which it began to recover steadily

Osika *et al.*, (2011) identified issues relevant to the explanation of the poor performance of the system especially from 2000. These are outmigration and hyper-inflation. The economic downturn that climaxed in 2008 led to a serious outmigration of skilled health workers, who deserted their post to search for better wages in neighboring South Africa and the rest of the world. More so, the 2008 hyper-inflation seriously disrupted health-care financing. Health budgeting became very difficult due to ever-changing prices. That led to a serious shortage of food, water, electricity and hospital utensils, which impacted negatively on the health care system performance

1.1.4 Zimbabwean Health Care System: Structure and Composition.

The Zimbabwe's health care delivery system is well structured. The primary level is the critical level of the health system. It is the first point of contact into the health care system. It includes clinics and hospitals and other health facilities mostly in rural areas such as home based care and rural midwifery centres. This level of health system is the one that caters for a large population in Zimbabwe. As of 2010, there were 1118 primary health care facilities which constitute 78 percent of the total health facilities. The secondary, tertiary and central levels all function as a referral chain. During the past decade Zimbabwe's health care service delivery fell drastically resulting in failing to sustain the progress it achieved soon after independence. This fall has been exacerbated by a lengthy political and economic crisis (World Health Organisation, 2012). The challenges in the health system includes among others, shortage of skilled professionals due to brain drain, eroded health infrastructure with ill equipped hospitals and lack of basic medicines

and commodities. These challenges have contributed significantly to decline in utilisation of health care facilities.

The Ministry of Health and Child welfare is in charge of the health care system for policy planning, administration, allocation of funds and coordinating responses to national health issues among others. The public sector is the largest provider of health care services in Zimbabwe,

Undoubtedly Zimbabwe's ranges of health care services providers compares favorably to other African countries. Zimbabwe health care system is well defined in terms of authority, division of care services and resource allocation. It comprises of public health services, church organizations, nonprofit groups, company operated clinics and hospitals, for profit private hospitals and traditional sector providers. The private health delivery system is highly decentralized with services provided at primary, secondary and tertiary levels. However, the public sector is highly centralized for administration purposes.

Zimbabwe's public health sector deteriorated seriously since the dawn of the new millennium. By 2008, numerous public health facilities had partially or totally collapsed. Some had actually closed while some provided limited services and lacked the health commodities (Ministry of Health and Child Care, 2017). This was exacerbated by serious economic decline that saw massive numbers of medical staff exodus in search of greener pastures abroad. It was during this same period that saw a sharp increase in private sector for profit providers. The table below shows the institutional composition of different providers across the country

Table 2: Institutional composition of health care centres in Zimbabwe

Type of facility	Number
Central Hospital	6
Provincial Hospital	7
District Hospital	46
Mission Hospital Designated as District Hospital	6
Rural clinic/Urban polyclinic	1118
Mission clinic/Hospital	86
Company clinic/Hospital	43
Private clinic/Hospital	93

Source: Author's presentation of data from www.mohcc.gov.zw. Retrieved on 22 September 2017.

The Zimbabwean health provision system is a blend of public providers and fragmented private providers. It is apparent from the table that the public sector is undoubtedly the biggest player in Zimbabwean health system. It owns rural and urban polyclinics, district hospitals, provincial and central hospitals. The private sector has also a fair share of clinics and hospitals in the form of mission clinics and hospitals, company clinics and hospitals as well as private clinics and hospitals. It is also imperative to mention that despite the presence of the formal structures that provide health care services, Zimbabweans, for some reason, still consult the informal traditional and religious healers, while some even resort to self-medication.

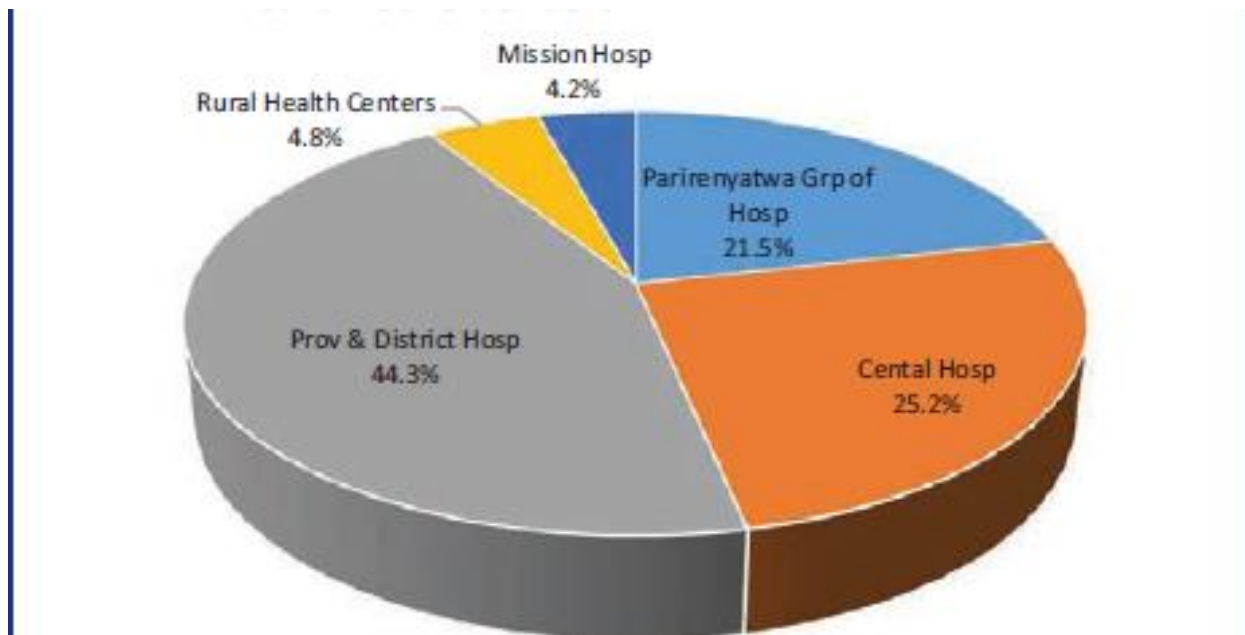
The main goal of the health system in Zimbabwe is to promote health and quality of life of the people of Zimbabwe. The main strategy for the health development is the use of primary health care to foster greater health services utilization and equality.

The Zimbabwean health care system and health care policy framework clearly stresses the desire to make especially the public health care services affordable, yet being of high quality. The intention is to promote universal health coverage and increased health care utilization. This is paramount to the achievement of health care goals and objectives. The government is so committed to improving the health of the citizens as evidenced by its commitments especially after independence.

The first decade after independence saw the construction of 316 public primary health care centres and 450 primary care clinics which later got upgraded to function as rural health centers (Mazingi and Kamidza, 2010). In addition, 10 district hospitals were built. Multi-disciplinary health training schools were constructed in all provincial capitals and the School of Medicine at the University of Zimbabwe was expanded.

Over the years, there had been huge subsidies and increasing budget allocation to the health sector, biased towards the public health care provider and as such, we expected improved health care quality and very low prices via the public provider. The pie chart below summarizes the allocation of the health care budget allocation for 2016.



Figure 2: Composition of 2016 Health Budget

Source: Ministry of Finance and Economic Development (2016)

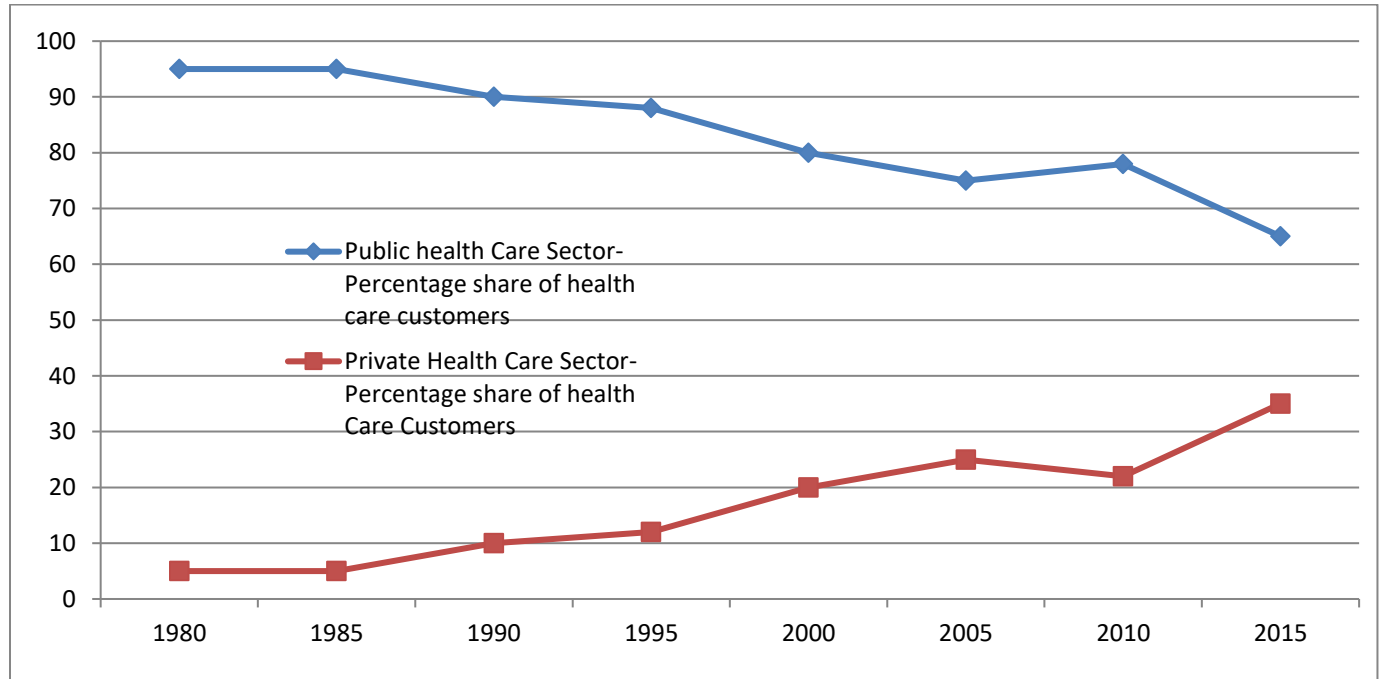
It is very clear that the government of Zimbabwe only have budget allocations for the public health service providers, with the exception of mission hospitals. This is a clear indication that the government of Zimbabwe seek to enhance health service provision primarily through the public hospitals and clinics. As the 2016 budget reveal, 44.3percent of the health budget was allocated to provincial and district hospitals, central hospitals were allocated 25.2percent. 21.5percent was allocated to Parirenyatwa Group of Hospitals while Mission Hospitals were allocated 4.2percent with rural health centres being allocated only 4.8percent.

More still, policy framework is biased towards the public health care provider. The government financial commitments into the health system follow the public health care system, with the exception of mission hospitals. The private sector is resented for its adherence to curative services and profiteering tendencies. The unorthodox health care providers are still segregated and not supported. They are almost repealed from the system, yet patients still consult them.

Despite all the financial commitments in building and funding public health facilities, utilisation of public health care services has generally low (Gill *et al.*, 2007). Zimbabweans continue to demand health care services from the private sector, formal and informal. This is evidenced by

the ever increasing size of the private sector since 1980. Statistics show that the relative size of public provider has been dwindling since 1980. The figure below highlights the trend.

Figure 3:Relative sizes of the public and private health care sectors since 1980



Source: Author's illustration of information accessed from Zimbabwe National Health Profiles- Ministry of Health and Child Welfare (1981), (1985),(1991), (1997), (2001); Ministry of Health and Child Care (2016).

In 1980, almost all health care services were provided by the public sector, with the private sector almost closed due to supposed inequities in health provision and its adherence to curative services (Mudyarabikwa, 2000) and the public health sector size was 95percent of the total health system (Ministry of Health and Child Welfare, 1981). The government gradually opened up for the private sector, whose market share grew to 10 percent by 1990. It continued to rise and by 2015, the public provider accounted for 65percent and the private sector 35 percent and the trend is continuing(MOHCC, 2016).This is evidence to suggest that people continue to consult the private sector for health services. Understanding the socio-economic factors underlying the choice of medical providers is very critical to informing health care policy making decisions.

1.2 Problem Statement

The Zimbabwean government's health policies and strategies have always been directed in favor of the public health service provider. The public health care sector has been the priority of the national health care budget and as a result, massive subsidies were persistently allocated through the public provider (Mudyarabikwa, 2000). Sadly, as highlighted above, the market share of the public health care providers dwindled over years. The policy question is, why do people shun the public health care service provider, yet with government's financial commitments, we expect the public provider to be the cheapest, and be of good quality?

It is puzzling to note that, despite government commitment to subsidize the public health care sector and improve quality, the public sector continued to lose its share of patients. The public health provider is, and has always been the cheapest in Zimbabwe, but still, Zimbabweans continue to demand health care services from the private sector, some even consult spiritual (religious and traditional healers) while some even resort to self treatment. We therefore raise the question, "are health care consumers irrational?" To understand why the public health provider's share of patients kept falling over the years, it requires us to analyze and investigate the deeply embedded factors that determine the choice of health care service provider in Zimbabwe. This study therefore seeks to investigate the determinants of the choice of health care providers in Zimbabwe as this gives us an insight into how people choose and utilize available health care services. In Zimbabwe it is still unclear what really influences this choice but it is well known that patients have been, and are still choosing certain providers over others.

1.3 Research Objectives

The overall objective of this study is to investigate the factors that determine the choice of health care services in Zimbabwe with the aim of proffering policies that promote access and health care utilization.

Specific objective

- ❖ To determine the socio-economic factors that influences the choice of health care services in Zimbabwe.
 - ❖ To ascertain if these factors are the same with respect to all health care providers.
-

1.4 Research Questions

In relation to the above stated objectives, the research questions raised by the study are:

- ❖ What are the socio-economic factors that inform the decision to use particular health care services?
- ❖ Are the factors that influence one to choose (or not choose) a particular provider the same for all health care providers?

1.5 Justification of the study

In Zimbabwe, there is significant unmet health needs. Health care organizations, governments and providers require a good understanding why people choose one against the other available health services. Health care management requires authorities to ascertain the factors that influence health care utilization. Increasing health care utilization is a challenge in Zimbabwe as people tend also to use multiple health care services like non-conventional health care services. Understanding why people choose or do not choose certain available services is central to increasing health care utility and efficacy.

The determinants of the choice of medical provider are an almost unexplored area in Southern Africa and particularly in Zimbabwe. The subject is mildly explored in developed countries. There are also scant studies done for African countries which include Muriithi (2013) on Kenya and Bolduc *et al.*, 1996) on Benin. However the only such study done for Southern Africa was by Stekelenburg (2004) which was done for Zambia and none had been done for Zimbabwe. Very little has been done to analyze the factors that influence the choice of health care provider in low income countries, hence this study will contribute to the body of knowledge.

Furthermore, results have been conflicting and very inconclusive. No study attempted to determine why the private sector and unorthodox providers had gained such prominence in most African countries. This study therefore seeks to fill this void in literature by analyzing the determinants of the choice of health service providers, focusing on Zimbabwe.

A critical understanding of the factors that determine the choice of medical services in Zimbabwe is also very important for policy formulation especially with regards to health care utilization and improving service delivery in the health sector.

1.6 Outline of the study

The rest of this study is organised as follows; Chapter two reviews both the theoretical and empirical literature on choice of health care services. Chapter three outlines the research methodology to be used in the study. Estimation, interpretation and discussion of the results will be covered in chapter four. Finally, chapter five will conclude the study by presenting a summary of the major findings, policy recommendations, and limitations of the study and areas for further research.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction.

The principal objective of this chapter is to provide comprehensive theoretical and empirical understanding to the process of making health-related decisions. In this chapter, the focus is to reveal how health care service choices are made and to determine what informs the decision to use a particular health service provider and review literature to elicit the factors that determine such a choice. The study reviews related literature on how the choice is made mainly from the theoretical viewpoint. The empirical review will reveal some of the major determinants that studies found relevant and the conclusions thereto. This study acknowledges that choice making literature is grounded in both economic and health sociology framework, hence theoretical literature on choice of health provider takes both fronts.

Theories discussed here, that follow the economic school of thought are the Grossman Demand for health model and the Revealed Preference theory. From the health sociological school of thought, the health care utilization model, Young's choice making model and the health belief model were reviewed. Concurrently, this chapter reviews empirical literature to deepen our understanding of the health care seeking behavior. Theoretical and empirical literature reviewed in this chapter give a framework for the study, which will therefore enable us to come up with an appropriate empirical model specification.

2.1 Theoretical Literature Review.

2.1.1 The Economic School of Thought

Revealed Preference Theory

Samuelson (1938) coined the revealed preference theory as an alternative approach to consumer behavior. It looks at people's observed choices and then makes an attempt to rationalize them. It tries to check if observed choices are compatible with optimization, and if so, what we can infer about preferences from the observed choices. This, unlike the utility theory, does not need the consumer to furnish us with more information about her, other than that we get from observing her making her shopping and purchases. It deviates from utility theory which rests entirely on

abstract assumptions about consumer behavior. This theory derives its logic from directly observed consumer behavior.

Given that tastes and preferences are stable, the revealed preference theory allows us to find all the information that we need for modeling consumer behavior by simply observing how consumers make choices about commodities at different prices. It is possible, theoretically, to construct the consumer's map of indifference curves if we have that very detail.

The revealed preference theory is rooted in the idea that a consumer, being rational, will make a decision to acquire a certain bundle of goods/services because he likes it more in comparison to other alternative, available bundles or simply because it is cheaper than other bundles.

Suppose we have two composite bundles of goods, A and B , which consist of several goods. Suppose the consumer chooses bundle A . We are not instantly able to conclude that she prefers bundle A to bundle B , for it is also possible that she chose A because it is the cheaper bundle. Had it not been so, she might have been happier with bundle B , it is therefore paramount to have information about prices to remove this uncertainty.

Suppose we ascertain that bundle A is not cheaper than bundle B , then we can safely conclude that bundle A is preferred to bundle B , hence despite bundle A not being cheaper, she purchases it because she likes it better. Here we derive that price is the first consideration to choices of goods or bundles.

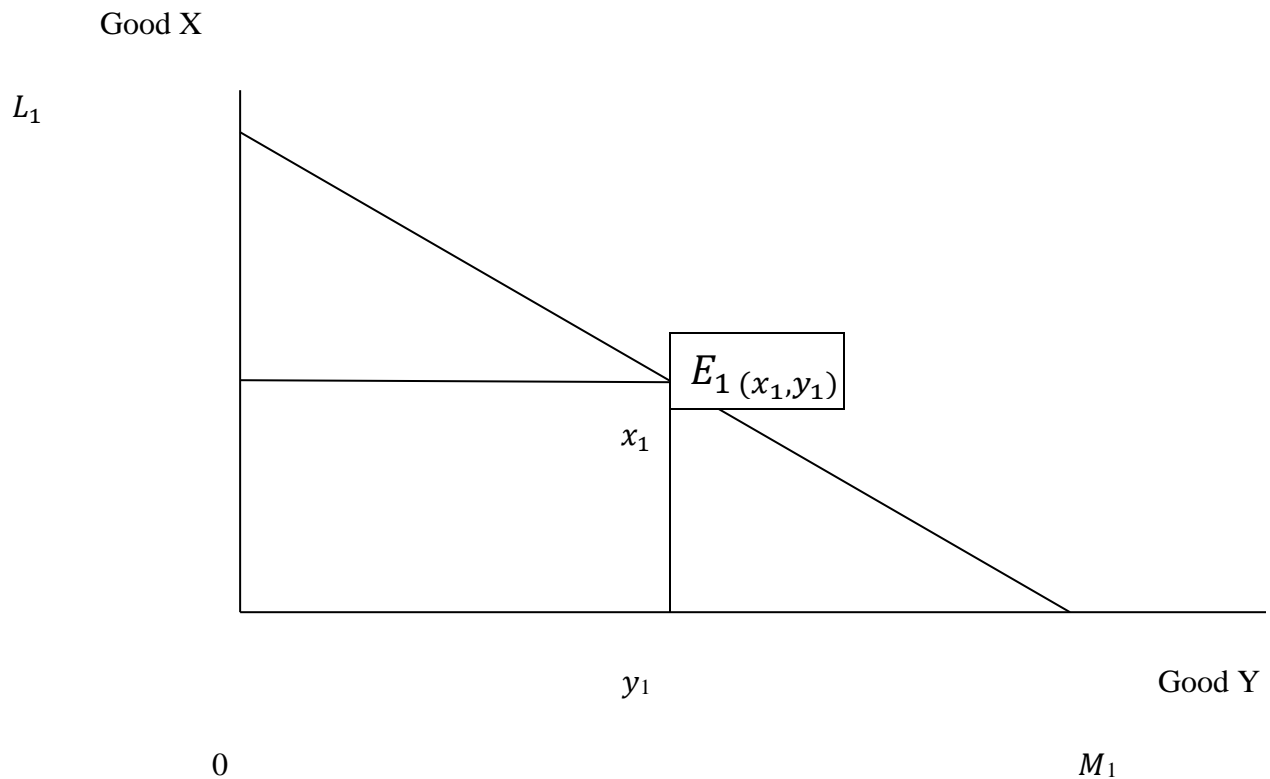
In general, the revealed preference theory states that if a consumer buys some bundle A , and not the alternative bundles, B , C , or D , and if none of the bundles B , C , or D is more expensive than A , then we conclude that bundle A is revealed preferred to B , C , and D . Alternatively we say bundles B , C , or D are revealed inferior to bundle A . But what then determines why another bundle or good is (revealed) preferred to another?

A number of assumptions are inherent in the revealed preference theory. First we assume that there are only two goods in the market, their quantities of which are always continuous. Secondly, more of both goods are preferred (monotonicity assumption). This assumption implies that indifference curves are negatively sloped. Third, preferences are convex, implying that indifference curves are strictly convex to the origin. Lastly we assume that the weak axiom of

revealed preferences holds. This assumption makes sure that if bundle A is chosen ahead of another affordable bundle B , then under no other circumstance will B be chosen whenever bundle A is available and no more expensive. This proposition clearly outlines that there is so much to consider in making choices, over and above prices.

Suppose we have two goods X and Y , and the equilibrium point is illustrated by the diagram below

Figure 4: Choice equilibrium and budget line.



Source: Author's Illustration

Suppose the consumer buys bundle E_1 , which is a combination of amounts x_1 and y_1 of goods X and Y respectively, and does not choose to buy bundle E_2 , at prices (p_x^1, p_y^1) , then we conclude that bundle E_1 is revealed preferred to E_2 if $p_x^1 x_1 + p_y^1 y_1 \geq p_x^1 x_2 + p_y^1 y_2$.

A bundle of goods X and Y , to which a particular bundle is revealed preferred can be found with the aid of a budget line. Let the budget line be $L_1 M_1$ and bundle E_1 lies on this line. The cost of all bundles that fall on the right or above the budget line is greater than the cost of bundle E_1 . We

cannot conclude that the consumer prefers bundle E_1 to these bundles when she chose bundle E_1 . Possibly, she chose this bundle because it is the affordable one. However if we observe her choosing bundle E_1 ahead of other bundles that lie on or below (to the left) the budget line, then the only plausible explanation is that she likes bundle E_1 better than these bundles, hence we conclude that bundle E_1 is revealed preferred to those bundles.

In summary, the model is an optimization model, based on rationalization of choices emanating from preferences. In reverse, the model of preferences should possess testable arguments that observed preferences should not violate. The primary objective of choice theory is to construct decision criteria. In empirical data, this evidence of the decision criteria comes in the form of observed choices.

A consumer will always purchase a combination of goods, which he changes as preferences, prices and income changes. The theory predicts that a consumer will never settle for any other bundle, which is more expensive than the revealed preferred one. There are three critical variables here, whose interplay determines choice of goods and their quantities. These are preferences, prices and income. The theory highlights that if price and or income changes, goods or bundles that were not previously chosen stand a chance to be chosen. Thus choice is largely determined by preferences and affordability. Implied in this theory is that the variable, preferences is a function of other variables that span from customer attributes to product specific attributes. As noted in the theory that we may not need to have any other information about the customer or product, except that which is gathered by observing the customer, it is arguable that the observed behavior is a result of that very information.

However, this might have been necessary if the modeling was to be introspective, this theory is retrospective (behavioral) on the contrary. In effect, consumer and product specific attributes are encompassed in the preferences variable. This makes the theory empirically more relevant in choice study as the inclusion of other variables in the empirical model may be justified by bearing on tastes and preferences.

The Revealed Preference Theory is widely considered superior to other earlier theories of demand and consumer behavior in that it is not based on introspective, psychological reasoning,

but rather on behavioristic analysis that is deduced from actual observed consumer behavior in the market, hence it is more realistic, scientific and objective a theory.

More-so, this theory is superior to other consumer behavior theories in that it completely dispenses with the heroic assumption that consumers are satisfaction maximisers, without making any dubious, untested hypotheses like the law of diminishing marginal rate of substitution as in the Hicksian analysis or the law of diminishing marginal utility inherent in the Marshallian analysis.

However, the theory has its own flaws. It does not explicitly outlines what factors are relevant and inherent in the preference function of an individual. In relation to this very study, it leaves a lot to be desired. While it gives room for further investigation into this preference function, it does not gives a clue to the nature of the variable pertinent to the preference function, hence in principle, it has an incomplete analysis because it still leaves us with the question, if preference determine choice, what then determine the preference function?

More-so, the theory assumes income has a positive effect on demand for goods and services. However, it is well known in demand analysis that income may have a negative effect on some good and services, and we expect a negative income elasticity of demand in such cases. The theory therefore fails to explain consumer demand in relation to inferior goods, whose income elasticity of demand is negative. Owing to this, it does fail also to explain the giffen paradox. Thus relating to health choices, it may be difficult to explain choice of health care services if health care tends to be an inferior good.

The theory also typically rejects that a consumer can be indifferent between goods or bundles. It is argued that if satisfaction is ordinal and comparable, the possibility of indifference will certainly be there. It therefore fails to explain choice in event that a consumer is indifferent. The theory argues that if A is chosen while B is available and not more expensive, in no circumstances should she choose B when A is available and not more expensive. But if it happens that the consumer is observed and chose B the next time, without A being more expensive, the indifference argument becomes the only plausible explanation for such observed behavior.

Arnot *et al.*, (2006) also highlighted that economic analysis that identifies consumer behavior as a function of economic variables is abstract and does not reflect the true consumer behavior. They argued that ethical consumers do not only care about income, prices and preferences, but sometimes are forced out of their preferences by ethical considerations. They concluded that any attempt to model consumer behavior that neglects the social influence on behavior is biased and incomplete.

Demand for health model.

Grossman (1972) developed one of the most used model in health economics. The model has been utilised by several studies to determine optimal health investment. Grossman posited that, because health is a fundamental good, health capital is very different from other forms of human capital. The model sought to determine how individuals allocate resources to produce and utilise health resources. The model proposed that individuals are both consumers and producers of health. People invest in human capital (education and health) to improve market and non-market productivity. While education (stock of knowledge) determines market and nonmarket productivity of individuals, health stock determines the amount of time spent on producing other commodities, which in-turn determines money earnings.

The following assumptions form the cornerstone of the Grossman (1972) model; firstly, it assumes that consumers demand health for two reasons, either as a consumption good or as an investment good. Secondly, the model also assumes that investment in health capital enters in the household production function which depends on some environmental factors that include the individual health level and the individual's education level. However, the individual health level is endogenous as it depends on resources allocated to health production.

Health as a consumption good view

Grossman argued that consumption of health provides utility hence it directly enters into the individuals' utility function. The individual's preferences are represented by the following inter temporal utility function.

$$U = U (\Phi_0 H_0, \dots, \Phi_i H_i, \dots Z_0, \dots, Z_i) \dots \dots \dots (1)$$

H_0 is the inherited stock of health, H_i is the total health stock at time i , $h = \Phi_i H_i$ is the consumption of all health services, Φ_i is the service flow per unit stock and Z_i is the consumption of all other commodities, excluding health in period i .

Health as an investment good view

This view proposed that health determines the number of days an individual is able to participate in income generating activities, whether nonmarket (household) or market (work) production activities. Grossman (1972) used the following model to model health as a capital good.

$$H_t = H_{t-1} - \delta_t H_t + I_t \dots \dots \dots (2)$$

The model suggests that health stock (H_t) at period t is dependent on investing in health (I_t) and the depreciation rate (δ_t). Depreciation, in this context, refers to the amount of health stock that is lost through diseases, accidents, carelessness and ageing. Inputs that include, health care, income, time, diet and environment enter in the health production function. Consumers make gross investment in health and non-healthy commodities in the utility according to household production functions shown below.

$$I = f(M, T_H; E)$$

$$Z = f(X, T_C; E) \dots \dots \dots (3)$$

Where I is gross health investment which is also a function of health care inputs from the market. M represents time, as an input in the investment function (T_H) and level of education (human capital) given by E . Z is the consumption of non-health goods and it also is a function of X which is a vector of goods input that enters into the production of commodity Z . T_C is time inputs for Z .

Grossman model's predictions are based on education, age and wages. In the investment version of the model, there is an inverse relationship between age and health demand. Demand for

health decreases when people grow older because age reduces the incentive to invest in health. Older people are less efficient in converting health investment into health stock. When age increases, the marginal cost of an additional health stock unit rises as well. Thus, age reduces health demand in the investment model.

The consumption model predicts that stock of health decreases with increasing age. This implies that people should demand more health care as they grow, since age comes with reduced health stock. This is more realistic since the observed phenomenon is that the aged people become more prone to diseases and as such visits the clinics and hospitals more often than the youthful ones.

Education has a positive relationship with demand for health in both versions of the model. An increase in education is associated with increasing knowledge in the health production function and it helps individuals to make more informed health consumption decisions and this replenishes the health stock by lowering health capital depreciation. Educated people are more efficient in health production. Implied in the model is that the more educated people are, the more likely they are to effectively utilize resources to produce health.

Wages have different impacts on the demand for health in the two variants of the model. In the health as a consumption good view, increase in wages reduces the demand for health because the higher the wage, the higher the marginal cost of holding health stock as consumption good. On the other hand, wages have a positive relationship with demand for health. Rising wage increases the incentive to work and the incentive to be healthy by increasing the returns to health capital. Thus, workers who earn higher wages tend to increase their optimal stock of health. Finally, health care price negatively affects demand for health as high prices of health care services increases the cost of health investment and health consumption.

The Grossman model offers a strong theoretical underpinning to health demand and health care seeking analysis. It provides a good framework for analysing health demand behaviour. Despite its great intuitive appeal and many insights that it provides in health economics, the Grossman model also suffers several limitations.

Firstly it predicts that a positive relationship exists between health stock and demand for health care services. However, some empirical studies had proved otherwise. They found a general negative relationship (Galama and Kapteyn, 2011; Zweifel and Breyer, 1997); More-so, .

Andersen (1968) and Young (1981) also argued that poor socioeconomic status militates against health care services utilisation. There is a host of other empirical evidence that supports that health stock declines rapidly for individuals with poor socioeconomic status, which the Grossman model does failed to predict this, neither explicitly nor impliedly

While the Grossman model acknowledges that agents are rational, its predictions do not factor the impact of past values of exogenous variables. Case and Deaton (2005) found evidence to suggest that prior experience in health care seeking is very important in deciding whether or not to utilise certain health care facilities.

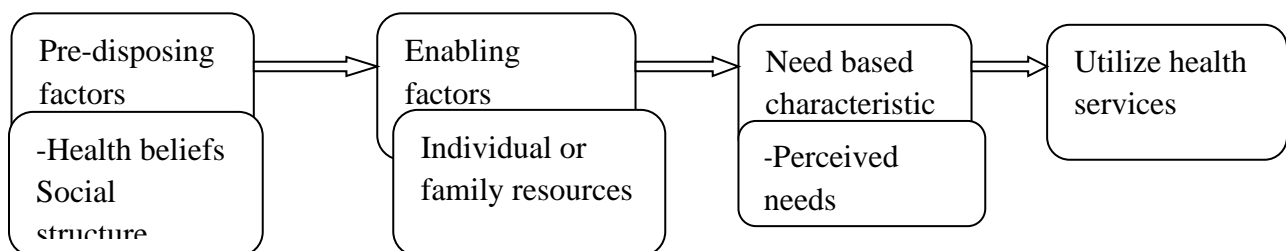
Grossman's model of demand for health, overall, is very useful as it provides clearly most relevant factors that determine health care behaviour. Demand for health care emanates from demand for health, hence it is derived demand. Demand for health care rises in response to demand for health. The choices that an individual make determine his or her optimal stock of health capital. This model therefore articulates that health care service utilization is a choice decision by agents who demand and produce health. In summary, the model hypothesises demand and choice of health care services to depend on education, age, time variables, as well as price and income.

2.1.2 Health Sociology School of Thought.

Health Care Utilization Model.

This is a conceptual model, developed by Andersen (1968) that seeks to explain factors that inform the decision to utilize particular health care services. The model can be diagrammatically represented as below.

Figure 5:Health care utilization model



Source: Adapted from Andersen (1968)

This model identifies three categories of the determinants of health care utilization which are pre-disposing factors, enabling factors and need based characteristics. Pre-disposing factors describe factors that incline an individual towards utilization of particular health care services. The individual's decision to utilize particular health care services is based upon his position within the social structure and his perception of the efficacy of the service provider.

Enabling factors analyze those factors that impede or promote the use of particular health care services. These include availability of resources that an individual, family and community can provide for one to access the health care services. It highlights that economic factors determine the choice of health care services, thus wealth and income are identified as the relevant variables.

Need based characteristics include the person perception of size of the health problem and severity of illness. This determines whether the individual should seek health care attention inside or outside the family. The model hypothesizes that people will resort to self-treatment and or family-treatment if the health problem is considered trivial. Andersen (1968) noted that need factors and enabling factors have however differential abilities in their explanatory power of choice of health care services. Health care services chosen in occasions of severe health problems would primarily be explained by needy factors while less pressing health problems like dental services that allow patients some discretionary power over choice would more likely be explained by social structure and enabling factors.

In the 1970's, Andersen's Utilisation Model was modified by Andersen and Newman to take into account health care systems characteristics and performance. A health care system comprises of resources, organisation and health care policy framework. Resources were defined to mean the amount and quality of labour and capital. Attributes that describe labour include education, skill and experience of health care professionals while capital attributes include infrastructure and health care equipment availability. Organisation refers to the management of available resources by health care systems and this affect accessibility. Accordingly, individual's choice of health care services is determined by how resources are structured and the adequacy of labour and capital in the health systems.

In addition, the revised model recognises that there are several health care service options at the disposal of individuals and the functions of health care system determine the kind of services

available. Therefore, according to the 1970's updated model, the choice of health care services is based on population and health care systems characteristics (Andersen, 1995; Andersen and Newman, 2005). Population characteristics includes predisposing, enabling and need based characteristic while health care systems characteristics includes health policy, resources and organisation. The consideration of these two types of characteristics influences the choice and use of health care services by type of facility(private, public, missionary, spiritual or self treatment) and by purpose (primary, secondary or tertiary) for consumer satisfaction.

Revised later again during the 1980's-1990's, the model sought to incorporate the supposed linear relationship that is believed to exist between primary determinants, health behaviour and health outcomes. According to this revised model, primary determinants directly determine health behaviour; these include demographic characteristics and the health care system attributes. This model postulates, furthermore, that health behaviour has direct implications on health outcomes. Health behaviour includes individual health contact such as utilisation of health service. Health outcomes encompass evaluated and perceived health status and consumer satisfaction.

The dependent variables of concern in the Andersen's Behavioural model are different dimensions of health care utilization that include choice of health care service provider or health outcome. Possible independent variable options (health care providers) are public facilities, formal private facilities and informal private facilities while predisposing factors and enabling factors explain "why" a particular choice. From this model a possible set of explanatory variables that are conspicuous include household size, age, income, education and health insurance cover.

This model has received credit especially on the realisation that health related decision is not only an individual or family's decisions, but also a community decision. This contrast diversely with the economic schools of thought, that take such decisions as being made especially at individual level, which is undoubtedly abstract from reality.

In empirical work, the application of this model, however has been vilified as over-emphasizing on importance of need factors as the critical determinant of choice of health care services at the expense of health beliefs and social structure (Coulton and Frost, 1982). Noelker and Bass

(1987) also criticized the model for ignoring social networks, social interactions and culture in the analysis.

Young (1981) Choice Making Model.

Young (1981)'s choice making model is based on ethnographic investigations of the health administrations use in Mexico. This model categorizes four fundamental considerations to the person's health administration decision. These considerations are: Perception of gravity of health problem, knowledge of home treatment, confidence in treatment and treatment availability.

Perception of gravity incorporates both the person's perception and their social networks' consideration of seriousness of the health problem. Gravity depends on the way the individual and society characterizes sicknesses by level of seriousness or gravity.

Knowledge of home treatment characterizes the event that the individual is aware of a home cure that is useful. Individuals will use home treatment first, before opting for a proficient health care framework. Home cure information depends on the lay referral system. The confidence in cure consolidates the person's conviction of adequacy of treatment for the exhibited health problem. An individual will not use the treatment in the event that they do not trust the treatment is viable and proficient.

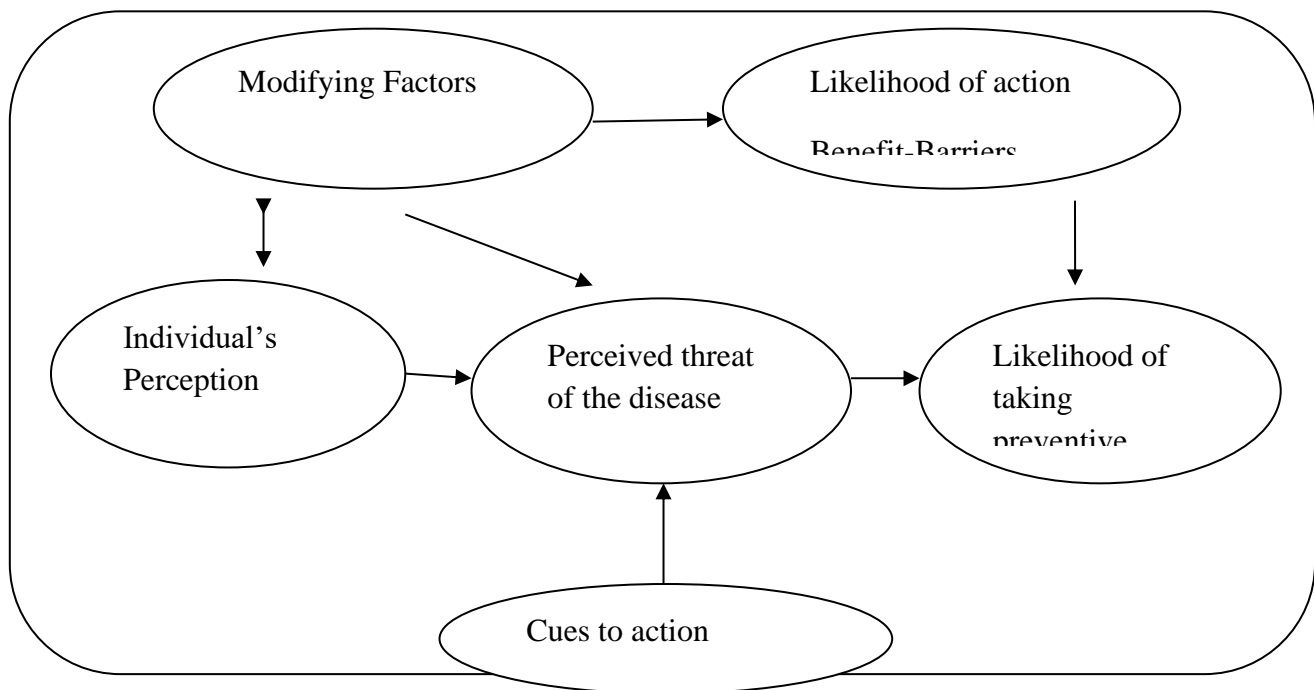
The availability of treatment incorporates the individual's evaluation of the health care services. It refers to one's evaluation of health care service costs, direct or indirect cost of the available services. This incorporates a consideration of socioeconomic status, travel distance to the facility and quality of the health care services. In this model economic costs go beyond treatment costs but also include opportunity cost of waiting time and transport costs incurred. Individuals of lower socioeconomic status are less likely to utilise formal health care services that require a fee upfront, and are also less likely to utilise services that are far from them.

Young's model has contributed immensely to health care services utilisation literature. However the model failed to recognise prior experience to utilisation of health care services as a major determinant of choice making. Mechanic (1986) argued that past experience with a health problem or facility determine the kind of health services that the person will seek. In this study, past experienced.

Health Belief Model

This model, developed by Rosenstock *et al.*,(1994), analyses the sick person decision to take preventive or curative action by considering his perception/belief of four fundamental variables; (1) His perceived susceptibility to the disease. An individual is more likely to seek preventive action if he perceives himself to be more prone to the disease (2) Individual's view of the severity of illness. If the person perceives the disease or illness to be less severe, he is less likely to seek preventive or curative measures; (3) Individuals rational cost-benefit analysis. An individual will not seek prevention or treatment of a disease unless he perceives that doing so is more beneficial than it is costly; (4) The individual's cues to action. Family, friends and relatives can provide prevention impetus, the absence of which reduces the likelihood of prevention.

Figure 6: The Health belief model.



Source: Adapted from Rosenstock et al.,(1994)

This model remains one of the widely used theories in health behavior research. It suggests that people's beliefs about health problems, perceived benefits of action and barriers and self efficacy explain engagement in health utilization behavior. It also argues that a cue must be present in order to trigger change in health care behavior. The model identifies perception variables as the major explanatory variables of health behavior.

The major weakness of this model is that it attempts to predict health behavior by considering only differences in beliefs and attitudes. It however fails to acknowledge other factors that other these perception variables, such as environmental and economic factors. More-so, the theoretical constructs of the model are criticized as being too broadly defined. In addition, cues to action are difficult to assess, hence limiting the model's research significance.

2.2 Empirical Literature Review.

In 2012, Muriithi (2013) carried out a study to investigate health care seeking behavior in Kibera slums, Nairobi, Kenya. He employed a multi-nomial logistic regression model specified as

$$P(\text{Choice} = y_i / x_{ij}) = \beta_0 + \beta_1 \text{Age} + \beta_2 \text{Agesquared} + \beta_3 \text{Gender} + \beta_4 \text{Education} + \beta_5 \text{Income} + \beta_6 \text{Insurance} + \beta_7 \text{Quality} + \beta_8 \text{Fees} + \beta_9 \text{Trust} + \beta_{10} \text{Distance} + \beta_{11} \text{Agesquared}$$

The dependant variable had multiple choices of health care services categories that included self medication, private services, public services and mission clinics/ hospitals. The study used self treatment as the reference category. The study made use of household surveys, which were reinforced by six focus group discussions, which information was needed to construct service quality indices. The results from the study were that distance had a negative significant impact on all provider choices, but higher in public clinics and hospitals. Trust and quality of services had a positive impact on all providers. The same with income, but the income effect was higher in private clinics and hospitals than in public. Surprisingly, Muriithi (2013) found that household size had a positive significant impact on all providers. The explanation for this was borrowed from Bolduc *et al.*, (1996) who proposed that the larger there are working members in the household, the more likely such individuals shun self medication and through resource pooling, the more they can afford to pay for services. Much as the study tried to accommodate all sources of health care services, it however did not take into account that some people seek health care services from religious and spiritual providers, a phenomenon across all Africa (Tembon and Tembon, 2016). More-so, religion in Africa cannot be ignored as a factor that determines health care seeking.

Frederickx (1998) carried out another study in Tanzania, in which he sought investigate the determinants of demand and health care choice in rural Tanzania, using a sequential logistic regression. He used survey data on rural districts, collected by Tanzanian Human Resources

Development Survey (1994). The explained variable was dichotomous and sequential while the explanatory variables were categorized as individual, household and community factors.

The descriptive results found that 15% of the sample reported falling sick in the last 12 months, of which only 34% received formal treatment. The results of the study showed that age, education, sex, distance and income were significant. The surprising result was that education, while significant at 1%, had a negative impact on health care utilization. This finding contradicts the priori-expectation derived from the Grossman health care demand model as well as other empirical findings by other studies.

The major strength of this study is that it used a large sample size (10 000) drawn from a wide area (10 rural provinces), which is very representative of most rural district in developing countries. The use of sequential logistic regression also captures well the nature of health care decision, first the sick individual decides whether to utilize health care facilities, and if so, which between private and public facilities. However, the research failed to factor in a very important determinant, user-fees. In Africa and most developing countries, health care services are not for free and involve a substantial fee (World Bank, 2015). Had this been factored in, the study might have been a masterpiece.

In 1996, Bolduc *et al.*, (1996) carried out a similar, but peculiar study in which they sought to investigate the choice of medical care providers in rural Benin. They were however determined to make a detailed comparison among the widely used econometric discrete choice models. As a result, they employed three models namely multinomial logistic, independent multinomial probit and multinomial probit. The study was based on data obtained from a primary health experiment carried out in the district of Quidah, Republic of Benin.

Generally, the results from the three model specifications were similar but the multinomial logit and multinomial probit results were even closer to each other in both sign and estimates magnitude. The statistically significant variables were basically the same in all the three specifications. User fees, illness severity, tontine (informal savings) were significant in all the three model specifications. However, income was significant in the multinomial probit and multinomial logit specifications, but it was not significant in the independent multinomial probit. Household income was significant in the independent multinomial probit and multinomial probit

models. The results from this study cleared the air over the appropriateness of the mostly used multi-nomial logistic model as the multinomial probit results seemed to validate the multinomial logit model results.

In 2008, Srivatava and Zhao (2008) carried another study which sought to investigate the impact of private health insurance on choice between public and private hospitals in Australia. A cursive trivariate probit system model was estimated, with partial observability that allowed for endogeneity of private health insurance variable. The study observed private/public choices for people who have visited the hospital within the last 12 months. The major results were that private health insurance status and income were the most important determinants of private hospital utilization. Individuals who had subscribed for private health insurance had 70 percent higher probability of choosing private hospitals. The study also found that the 10th income decile group had 46 percent higher chance of choosing private hospital care than those who fell in the lower income decile group. Other significant variables, though with less explanatory power were perceived quality of care in the public hospitals and user fees were found to have impact on private hospital care. These results were very much in tandem with Gertler and Strum (1997), who found out that as people get private medical insurance coverage, they change their preferred health care provider from public to private providers for both curative and preventive care in Jamaica.

An investigation in Jamaica, done by Propper (2000) found comparable results. Propper (2000) concluded that people are very consistent in their choice of health care facilities over time, except when their preferred choice becomes unaffordable or unavailable. In that study Propper (2000) investigated the impact of private health insurance on health services selection. Using the maximum likelihood technique, Propper (2000) found out that those individuals who had private medical coverage had a higher probability of looking for health care services in the high quality private hospital facilities. Some studies that have examined the choice of medical services in African countries also found different results. Health services in African public clinics and hospitals were found to be sub-standard and inadequate. The studies further clearly stipulated that user fees in most African countries public facilities are significantly higher as to cause acute inequalities in health access and amount to catastrophic expenditure. The absence of

proper funding negatively affected access and use of the health facilities in public health facilities (Lindsay and Feinbaum, 1984).

In 1973, Berkanovic and Reeder (1973) researched into the utilization of health services in Los Angeles, USA. From a review of the literature bearing on the use of health service, they identified that three alternative models of the determinants of health behavior emerge. These are culture of poverty, unequal access, cultural and social psychological differences related to ethnicity and socioeconomic status. The study used data availed by the Survey Research Centre that was collected for Los Angeles County in 1971. The data indicated that complex cultural factors are important determinants of the utilization of formal health care services.

Tembon and Tembon (2016) carried out a similar study for North-West Province, Cameroon, which sought to investigate household health behavior using both descriptive and econometric analysis. The study found out that one-third of the 1147 households interviewed resort to self-treatment, another third utilize government health care centres whilst the other third utilize traditional healers, religious healers or private health care centres. Using a probit model, Tembon and Tembon (2016) found that there are many factors that influence the choice of health care, the most important of which is quality of the service. As quality of care increases in governmental health centres, their probability of being the patients' choice also increases. Other factors include: the time spent seeking treatment; household income and size; distance; and, cost of health care. Households with higher incomes tend to utilize private health units and larger families tend to choose government health units. Other socio-cultural factors, difficult to model, appear to also influence the choice of providers (Tembon and Tembon, 2016). The researchers prescribed that since household income influences the choice of private health units, poverty reduction policies should be instituted in the rural areas to provide households with income. This will enable them to widen access to private health care services. Unlike most studies done along this area, this is one of the few that recognized that health care seeking decisions are made, not as personal decisions, but at household level.

In 2016, Weller *et al.*, (2017) carried out a study that sought to identify and describe factors associated with the choice of a health care source in rural Guatemala. Illness case histories were collected from a random sample of 270 households in six villages. Then, two differing methodologies were employed to predict treatment choices. First, a socio-behavioral model,

which encompasses enabling, predisposing, and need factors, was used to predict treatment choices. Using discriminant analysis, they identified factors relevant to the use of home remedies, a pharmacy, the health post, a physician, or folk (traditional or religious) healer. They identified that economic and socio-economic factors were both relevant to the use of treatment choice.

In a second, parallel study, descriptive interviews were employed to identify factors that determine the choice of a treatment strategy. From these interviews, and from responses to hypothetical illness cases, they developed a decision model of treatment actions. Both models were tested against the set of illness cases. Results indicated that both approaches identified similar variables, although selection of variables through the multivariate analysis was much more successful in predicting treatment actions. Their results highlighted that perceived illness severity, illness duration and time missed from work were the strongest predictors of health care choice in rural Guatemala as they accounted for 58 percent treatment choices, 23 percent better than chance ($\tau = 0.23$). Amazingly they found provider characteristics such as service quality and queuing time less predictive of health care choice. Weller *et al.*, (2017) went on to make a comparison of health care choice by decision rules and actions actually taken. They found out that the model predicted 7 percent better than chance. A further analysis of illness cases by household revealed that 49 percent illness cases would be incorrectly classified.

A similar study on choice between institutional health care provider between private and public health care services was done by Kesterton *et al.*, (2010) in 2009 for India. The study used Descriptive statistics to analyse patients' choice between private and public health care provider. A two level logit model was used as the econometric tool of analysis. The study used data availed from 1992 and 1998 National Family Health Surveys. The dependent variable was choice of health care provider while income, religion, travel distance to health care facility, insurance and education were the exogenous variables. Similarly, in 2011, Munkin (2011) employed a sequential probit model to ascertain the determinants of choice of hospital services in the United States. The two studies had strikingly similar results. Insurance cover and economic variable (income and user fees) had the most explanatory power on choice of health care provider. Poorer patients had less chances of choosing private (for profit) health care providers. Unlike most studies on health care seeking behaviour, Kesterton *et al.*, (2010) and Munkin (2011) argued that

the choice of health care facilities is done in a sequential fashion. Consequently, Kesterton *et al.*, (2010) employed a two-level logit model and Munkin (2011) applied a sequential probit model. These two models makes more sense when considering the sequential nature of such decisions. Patients, practically make decisions whether to seek health care services from institutional or non institutional healthcare providers. If they chose to seek services from institutional provider, they, more still, have to choose again on whether public health care providers or private health care providers. This phenomenon was, notably, ignored or left out in most studies done on this subject. Nonetheless, the relevance of Kesterton *et al.*, (2010)' study was undermined by using data that was outdated in relation to the time that the study was carried out. The study used 1992 and 1998 data. Had it used current data, the study would have been a masterpiece. Munkin (2011), on the other hand, could not justify why he did not included health service provider characteristics as was done by other studies like Tembon and Tembon (2016) and Weller *et al.*, (2017). However the divergence they took in econometric modelling is much closer to observed health care seeking behaviour.

Tran (2012) carried a similar study on the effects of demographic and socioeconomic factors on the choice of place for child delivery services in Vietnam in 2012. Questionnaires were used to collect primary data. 2657 pregnant women was the sample size. The dependant variables were delivery care utilisation and antenatal care. A multi-logistic regression model was used to identify the determinants of choice of place of child delivery among women. Education, household income, occupation, antenatal visits, insurance cover, place of residence and community environment were used as the independent variables. The study results showed that socioeconomic variables, that is, occupation, household income, insurance cover and place of residence were statistically significant in explaining the choice of place of child delivery by pregnant women. More-so, the study found out that less educated women had lower chances of choosing institutional delivery services. The study also found that women who come from poorer families had more chances of choosing institutional delivery, a surprising result which Tran (2012) made no attempt to explain. Tran (2012) used the Andersen Health Behavioural Model to select the variables. However availability and quality of health care services, which the Andersen Health Behavioural Model also identified were not included. The study only paid attention to personal, population and household factors. The study would have been even better had it included other factors such as severity of the health problem and prior experience.

2.3 Summary and Conclusion

This chapter has reviewed theoretical literature that rests on economic ground and these are; the revealed preference theory and the Grossman model. From these theories, variables such as prices (user fees in health), income, age and education were identified to influence consumer choice and behaviour. This study found it necessary to go a step further and review some commonly used health-sociology theories that include Young's choice making model, Health Belief model and Health utilisation model. These models elucidated that socio-economic variables as well as demographic variables such as insurance cover, travel distance (cost or time), illness severity, religion (beliefs) and prior experience are important in health seeking behaviour. This has been validated by empirical studies that found these variables important in explaining health care seeking behavior. However, some of these variables were not significant in other studies. This study therefore will include some of these variables that theory and empirical literature have identified. Having evaluated the procedures and methodologies used by several studies, this research is going to adopt a research procedure and methodology used by Muriithi (2013)

CHAPTER THREE

RESEARCH METHODOLOGY.

3.0 Introduction

This chapter outlines the methods and procedures that will be employed to identify the factors that influence choice of health care services in Zimbabwe. The first section presents the theoretical and empirical models. The chapter outlines the definitions and justification of variables that are going to be used in the study. The last section is on data sources, sample and sampling procedures.

3.1 Theoretical model and justification

The study seeks to model factors that influence the choice of health care services. In this case, a sick individual has a number of options from which he gets health care services. These options are Public hospital/Clinic, Private Hospital/Clinic, Missionary Hospital/Clinic, Spiritual/Religious Healer and Self treatment. Given that choice of health care services is discrete, and follows a certain probability function, qualitative response models are most suitable to apply in this study. The study therefore has a choice to use the Multinomial Probit (MP) model, linear Probability Model (LPM) or Multinomial Logistic (ML) model.

However, the linear probability model suffers from several weaknesses that include that the error term, U_i is not normally distributed, heteroskedasticity of the variance of error term, a generally lower coefficient of determination, R^2 , whose use is very limited. More-so there is a possibility of predicting probability values that do not lie within the $(0 \leq Pr \leq 1)$ probability range. Furthermore, it is not possible with the linear probability model, to compute marginal effects with respect to a dummy variable (Wooldridge, 2004). This study, for these reasons, could not apply the LPM, hence the study had two feasible options left: the Multinomial Logit and the Multinomial Probit models.

The probit (simple or multinomial) model and the logit (simple or multi-nomial) model follows the cumulative distribution and logistic distributions respectively. The probit and logit models are similar in most respects (Gujarati, 2004). The main difference is that the logistic distribution function is flatter than the cumulative distribution function. The implication is that the conditional probability of the probit function approaches 0 or 1 at a faster rate than that of the

logit. There is, however no compelling reason to choose one model ahead of the other. This study chose to apply the multinomial logit model. Of the two models, this researcher finds the statistical package used, STATA 13, technically more user-friendly with the multinomial logit than the multinomial probit model.

3.1.2 The Multi-nomial Logit Model

The Multinomial logistic regression is used to model nominal outcome variables, in which the log of odds of the outcomes are modeled as a linear combination of the predictor variables (Gujarati, 2004). Croissant (2003) argued that the Multinomial Logit model is more suitable and useful when one seeks to estimate models with unordered discrete dependant variables that are mutually exclusive; using either revealed or stated preferences. Muriithi (2013) and Bolduc *et al.*, (1996) also utilized the same model, when they investigated on how patients choose between available service providers in Kenya and Benin respectively. Though Bolduc *et al.*, (1996) was more concerned with comparison of several discrete models, their results and conclusion showed that they were more confided with the multinomial logit and multinomial probit models. An individual is assumed to know all provider-specific attributes and consequently makes a choice that maximizes his utility. As is well-known in discrete choice literature, the observed choice is determined by the differences in utilities between available choices, and not by the actual utility level per se. This calls for normalization of the parameters of one of the alternatives which is the reference category. The model is obtained by applying a transformation of the utility functions V_{js} , associated with particular choice outcomes;

$$V_{i1} = V_{i1} - V_{IJ} = (Z_{I1} - Z_{ij})\beta + X_i(\gamma_1 - \gamma_j) + (\varepsilon_{i1} - \varepsilon_{ij}) \dots\dots\dots 3.1$$

$$V_{i2} = V_{i2} - V_{IJ} = (Z_{I2} - Z_{ij})\beta + X_i(\gamma_2 - \gamma_j) + (\varepsilon_{i2} - \varepsilon_{ij}) \dots\dots\dots 3.2$$

$$V_{ij-1} = V_{ij-1} - V_{IJ} = (Z_{Ij-1} - Z_{ij})\beta + X_i(\gamma_{j-1} - \gamma_j) + (\varepsilon_{ij-1} - \varepsilon_{ij}) \dots\dots\dots 3.3$$

We rewrite these equations as:

$$V_{j1} = \bar{Z}_{i1}\beta + X_i\bar{\gamma}_1 + \bar{\varepsilon}_{i1} \dots\dots\dots 3.4$$

$$V_{j2} = \bar{Z}_{i2}\beta + X_i\bar{\gamma}_2 + \bar{\varepsilon}_{i2} \dots\dots\dots 3.5$$

$$V_{jk} = \bar{Z}_{ik}\beta + X_i\bar{\gamma}_1 + \bar{\varepsilon}_{ik} \dots\dots\dots 3.6$$

Where $k = j - 1$

Assuming that ε_{ij} is identically distributed, then the probability that an individual chooses alternative j can be shown as

$$P_{ij} = \frac{e^{\bar{Z}_{ij}\beta + X_i\bar{\gamma}_j}}{\sum_{l=1}^k e^{\bar{Z}_{il}\beta + X_i\bar{\gamma}_l}} \dots\dots\dots 3.7$$

Since $0 \leq P_{ij} \leq 1$, a restriction is required for model identification. The mostly used restriction is $\beta_1 = 0$. We then express the utility index as $V_{ij} = P(V_{ij} > V_{ik})$ for all $j \neq k$, where V_{ij} is the individual i 's perceived utility or benefit to utilize service j while V_{ik} is individual i 's perceived utility to utilize service k .

The random utility model corresponding to this specification is developed and takes the form: $V_{ij} = V(X_i, Z_j, I_i) + \varepsilon_j$, where X_i defines the personal characteristics, Z_j defines service attributes and I_i defines the information index that the individual has about all the services. The major advantage of this specification is its easy of computation. This probably explains why it has been used so frequently in literature.

However, the multinomial logit suffers the problem of independence from irrelevant alternatives. The odds ratios in the multinomial logit are independent of other alternatives. This property is appealing with regards to estimation, but it is not so convincing to place such restrictions on consumer behavior, for it is very possible that utility derived from one choice may be dependent on the use or non-use thereof, of the other alternative, much as this applies to tangible consumer goods.

3.1.3 The Empirical Model

The empirical model was borrowed from earlier studies by Muriithi, (2013) and (Bolduc *et al.*, (1996) and then modified. A new choice variable, spiritual/religious healer was added on the dependant variables as another source of health care services, to suit the Zimbabwean context. More-so, a new explanatory variable, severity of health problem was also added as identified from literature review. Some variable were also omitted due to difficulties with capturing them. These include tontine (informal savings), waiting time and travel distance

$$P(\text{Choice} = y_i / x_{ij}) = \beta_0 + \beta_1 \text{age} + \beta_2 \text{agesq} + \beta_3 \text{gender} + \beta_4 \text{eduyrs} + \beta_5 \text{income} + \beta_6 \text{rel} + \beta_7 \text{insurc} + \beta_8 \text{sev} + \beta_9 \text{qual} + \beta_{10} \text{fees} \dots \dots \dots 3.1$$

Where

age = the age of the patient, in years

agesq = the square of variable Age

gender = the gender of the patient

eduyrs = the number of schooling years of the patient

income = the monthly household income

rel = the religion of the patient

insurc = insurance cover

sev = the perceived severity of the health problem

qual = the perceived quality of care received

fees = the user fees that the patient paid to access medical service

3.2 Definition and Justification of Variables

Drawing from the theoretical literature which include the revealed preference theory, the demand for health model, the health care utilisation model, Young (1981)'s choice making model and the health belief model, the explanatory variables include individual specific characteristics or health services characteristics. These can also be grouped as socioeconomic and demographic variables. These factors include household income, household size, service fees, religion, age, severity of illness, and perceived service quality.

3.2.1 Dependent Variable

Choice of health care services (*choice*)

The study used discrete dependent variables. Options of health care services available in Zimbabwe were grouped as public clinic/hospital, private clinic/hospital (for profit), Mission

clinics/hospitals, self treatment, religious/ spiritual healers. A discrete dependent variable model was also used by other scholars including Muriithi (2013) and Bolduc *et al* (1996) when modeling health seeking behavior in Africa. However they both did not consider religious/spiritual treatment as an option in their modeling perhaps because it is non-existent or insignificant in Kenya and Benin. However, spiritualism is so evident in Zimbabwe that this research could not afford to ignore it. Choice of health care service was captured as an exclusive, discrete variable.

3.2.2 Independent Variables

Income (*income*)

Wages increases the demand for health by increasing incentive to work, which in turn increases the incentive to be health (Grossman, 1972). Income is one of the determinants of optimal bundle and choice of goods services, over and above price and preferences (Samuelson, 1938). Empirical findings by Tembon and Tembon (2016) concluded that higher income families tend to utilize private, high quality health services.

Household income in this study captures the economic status of the household. It was captured as the monthly income of a household after tax deductions. The higher the household income, the more they are able to access health services. This study expects that as income rises, people would shift their demand for health care services from non-institutional providers towards institutional providers. Income was captured as a continuous variable.

Household size (*hhsz*)

Household size in this study is the total number of people living together. As opposed to other studies that categorized this variable, no categories will be used to capture this variable but rather it will be captured as a continuous variable, where respondents will state the number of the individuals whom they stay together with. The study expects that the larger the household size the smaller the per capita consumption and the less likely that they will be able to access expensive health care services. Household size was captured as a continuous variable.

Educational level (*eduys*)

Grossman (1972) argued that educated people are very efficient in health care utilization and production. Supporting this, Joe and Mishra (2009) found that higher educational level attracts higher income. This research therefore anticipates a low probability for less educated people

choosing efficient and costly health care services such as private formal health care services and anticipates a high probability that educated people choose to utilize high quality, expensive health care services. Education was captured as a continuous variable in number of schooling years.

Religion (*rel*)

Religion plays a role in influencing the decision of choice of health care services in Zimbabwe. For example, members of the apostolic sect religion tend to be discouraged from the use conventional medical care and are therefore expected to have a low probability of seeking medical services from such. The health belief model argues that health care seeking decisions are certainly guided by beliefs (Rosenstock *et al.*, 1994). Unlike other studies (Muriithi, 2013; Bolduc *et al.*, 1996) that ignored the impact of religion, this research is convinced that religion does play a role in health care seeking behavior in Africa, and particularly in Zimbabwe. Rather, such consumers tend to prefer spiritual or self-treatment as an alternative to treatment from clinics and hospitals. The study expects lower probabilities of consumers seeking health care services from clinic or hospitals if they belong to the apostolic sect religion. In this study, religion was captured as a dummy variable. Belonging to the apostolic sect was coded as 1 and 0 otherwise.

Age (*age*)

Age increases depreciation rate of health stock, therefore health stock is expected to fall with increasing age (Grossman, 1972). Empirical literature however had conflicting results on the effect of age on choice of health care services. Some studies have found that senior citizen utilize more formal healthcare services than younger ones which is attributed to the experience hypothesis (Envuladu *et al.*, 2013). Other studies (Williams, 2017) found that senior citizens prefer informal health care services like self treatment and spiritual treatment. The relationship between age and the probability of utilising particular health care facilities is not straightforward, but rather vague. In this study, age was captured as a continuous variable.

Age-squared (*agesq*)

Literature highlighted that there exist differences between junior and senior citizens with regards to health behaviour. The inclusion of the variable age squared is motivated by the desire to capture the turning point that separates between the junior and senior citizens by health behaviour.

Gender (*gender*)

Bertakis *et al.*, (2000) argued that gender is a very fundamental social economic determinant of health care seeking behavior. They also argued that biological differences between men and women influence their frequencies of illness as well as their tastes in medical preferences. Mufunda *et al.*, (2012) also argued that empirical studies have found that generally men procrastinate to seek medical attention. This was also evidenced by results from a research by Bertakis *et al.*, (2000). The research concluded that more women readily seek medical attention from professional practitioners than men and men have a tendency to seek medical attention when the health problem gets severe. Other studies that include Kuunibe and Dary, (2012) and Tembon and Tembon(2016), that investigated health seeking behaviour also included gender as an explanatory variable and it was significant. Gender was captured as a dummy variable with female coded as 1 and 0 otherwise.

Severity of health problem (*sev*)

In Zimbabwe, scientific medical practitioners had acknowledged inability to cure certain severe complications; consequently patients are often referred to spiritual/religious or traditional healers as there is a general belief that such ailments have a spiritual genesis. In the health utilization model, Andersen(1968) argued that illness severity determines whether the individual should seek health care attention inside or outside the family. He also hypothesized that people will resort to self-treatment and or family-treatment if the health problem is trivial.

The general expectation is that people resort to self treatment if sickness is perceived less severe. They seek very specialized services from state-of-the-art private or public hospitals if the health problem is serious. This study captured severity as a dummy variable, with perceived severe illness coded as 1 and 0 otherwise. The severity will be as perceived by the household or patient.

Insurance Cover (*insurc*)

Having insurance cover reduces the out-of-pocket expenditure for health services. This increases accessibility and utilisation of health care services. Several studies from empirical review (Larsen, 2004; Kevany *et al.*, 2012) have shown that insurance cover increases the probability of utilising formal health care facilities, of which in Zimbabwe almost all institutional health care services require the patient to pay some fee. Insurance cover is therefore expected to increase the probability of utilising orthodox health care facilities; hence a positive relation is expected.

Insurance cover is treated as a dummy variable and was coded as 1 if the individual is health insured and 0 if otherwise.

User fees (*fee*)

The theory of demand analyses purchasing decision based on prices and income. The revealed preference theory argued that the choice or bundles of goods changes when price, income and or preferences changes. Health services are not fully subsidized, as such, firms charge user-fees. More-so, most studies that investigated this subject had user-fees as the key variable. These include Kesterton *et al.*, (2010), Muriithi, (2013) and Subedi, (1989). User-fees were captured as per prior patient experience. They were captured as a continuous variable, measured by the amount of money that the patient paid upon accessing the health services on their last visit to health provider.

Perceived Quality of Service(*qual*)

The health belief model identifies three perception variables relevant to health care utilisation decisions, among them is the perceived severity of illness. This model argued that people seek health care services from outside the family if the illness is perceived to be severe. The quality of health care service is as perceived by the patient. It was captured as a dummy variable coded as 1 when the health problem is perceived to be severe and 0 if otherwise.

3.3 Data Sources and Collection

Communicable diseases in Harare are known to hit hard in Budiriro, Kuwadzana, Epworth and Dzivarasekwa and the epicenter of these epidemics mostly is Budiriro. Budiriro experienced several health hazards, including Cholera outbreaks in 2009, 2012 and Typhoid epidemic in 2013, which led to the setting up of Cholera treatment centre in Budiriro 2 (Ministry of Health and Child Care, 2013).

The total population of Budiriro 4 could not be established. However, information gathered from the local authority revealed that there are approximately 1900 residential houses in Budiriro 4. ZIMSTAT (2012) also revealed that, in urban Harare, the average number of households per house is 2. This gives us an estimated household population of 3800 people in Budiriro 4. Newbold (1995) argued that in most populations, $n > 30$ is enough a condition to ensure a sampling distribution is nearly normal.

Using Cochran (1977) sample size determination formula, at 95% level of confidence gives us

$$N_0 = \frac{t^2 pq}{d^2} = \frac{1.645^2 * 0.5 * 0.5}{0.1^2} = 67.65$$

This sample size is not bigger than the researcher could manage hence there was no need for Cochran sample size correction formula. The closer the sample size is to the total population, the more reliable is the inferences drawn from it to relate to the population. With respect to multinomial logistic regression, the rule of thumb requires at least 10 outcome events per predictor variable. Many authors also prescribed a minimum of 10 observations per explanatory variable (Hosmer *et al.*, 2013 and Schwab, 2002). LeBlanc and Fitzgerald (2000) also cautioned that 20 observations per predictor variable may be sought if possible. Based on these suggestions and what is feasible, a minimum sample of 10 to 20 observations per predictor variable is more reliable. Given that this study will start with 10 predictor variables before restricting the model to significant variables, a minimum sample size of 100 is required. This study is however going to use a sample of 150 to make sure that a sample unit of 10 to 20 observations per explanatory variable is observed.

Guided by Berkanovic and Reeder (1973), the research sought to collect information from people that used health care services within the last 12 months, therefore in the questionnaire² there was a demarcating question so as to identify the relevant sample.

Though a probability sampling technique would have been the best in-order to avoid bias, non-probability sampling techniques were nonetheless employed. These were purposive sampling and snow balling sampling techniques. Purposive sampling relies on the judgment of the researcher to select the units of the sample. In this study, only respondents who reported having been sick within the past 12 months were included in the sample. Some of the units required to make up the sample, such as Apostolic Church members were difficult to identify, hence snowballing was also used. Non-probability sampling techniques were adopted since it was not feasible to carry out probability sampling due to limited time and resources. The researcher opted to use questionnaires ahead of other data collection methods because of their easy of administration. A pilot questionnaire was designed for testing. In the preliminary survey, 20

² See appendix 1

questionnaires were administered. This allowed the researcher to evaluate and improve the questionnaire structure and questions.

3.4 Diagnostic Tests

Multicollinearity Test

To detect the existence of a strong or exact linear relationship amongst the explanatory variable, a pair-wise correlation test was performed. In order to carry out this correlation test, a correlation matrix was constructed. Following the rule of thumb, if pair-wise correlation coefficient between two explanatory variables is greater or equal to 0.8 in absolute value, then the problem of multicollinearity exist, which results in large variances. This problem can be solved by dropping one of the collinear variables.

The Wald Test and the Likelihood Ratio Tests of Specification.

The Wald test is used to test whether the model is correctly specified. The null hypothesis is that the model is not correctly specified, thus removing one or more equations and or predictor variables will not significantly change the fit of the model. In the case of a multinomial logit model, we test if the model is correctly specified by examining the significance of all the equations and variable in the model. The model is correctly specified if all the equations, as well as the variables, in the model are significant. The null hypotheses are that we can improve the fit of the model if one or more of the equations, or variables, are removed from the model. We may reject the null hypothesis if the Chi-square probability < 0.05 and conclude the model fits better when that equation, or variable is included.

If we conclude that an equation(s) or variable(s) is not significant in the model, we drop insignificant variable(s) and/or equation(s), and then construct the restricted model³, then we proceed to perform the likelihood ratio test, which compares the fit of the unrestricted⁴ model and the restricted model. The null hypothesis is that the restricted model is better than the unrestricted model. We may reject the null hypothesis if the Chi-square p-value < 0.05 and conclude that adding the equation(s) or variable(s) significantly improve the fit of the model, thus we found no evidence that removing the equations and or variables does improve the fit of the model. If the p-value > 0.05 , we fail to reject the null hypothesis and conclude that the

³ The restricted model does not include one or more equations and or predictor variables

⁴ The unrestricted model is the original model which contains all equations and variables

restricted model is the better model, hence the model is correctly specified when those equations and or variables are removed.

3.5 Conclusion

This chapter outlined the methodology that was used to collect data. It also presented the necessary estimation procedures and various tests carried out in establishing which variables determine the choice of health care services. The results are presented, interpreted and discussed in the next chapter.

CHAPTER FOUR

ESTIMATION, PRESENTATION AND INTERPRETATION OF RESULTS.

4.0 Introduction.

The purpose of this study is to examine the factors that influence the choice of health care services using data from Budiro 4 high density suburbs. This chapter focuses on the estimation, presentation and interpretation of the empirical findings of the study. The chapter starts by presentation of descriptive characteristics of the sample, followed by the econometric results presentation and interpretation. STATA, version 13 was used for all econometric estimations.

4.1 Descriptive Statistics.

The study used information provided by respondents who reported having been sick within the last 12 months, and all questionnaires that reported an individual not having been sick within the last 12 months were disregarded until 150 questionnaires were fully completed. The table below shows the descriptive characteristics of the 150 people who reported having been sick within the last 12 months.

Table 3: Descriptive Statistics.

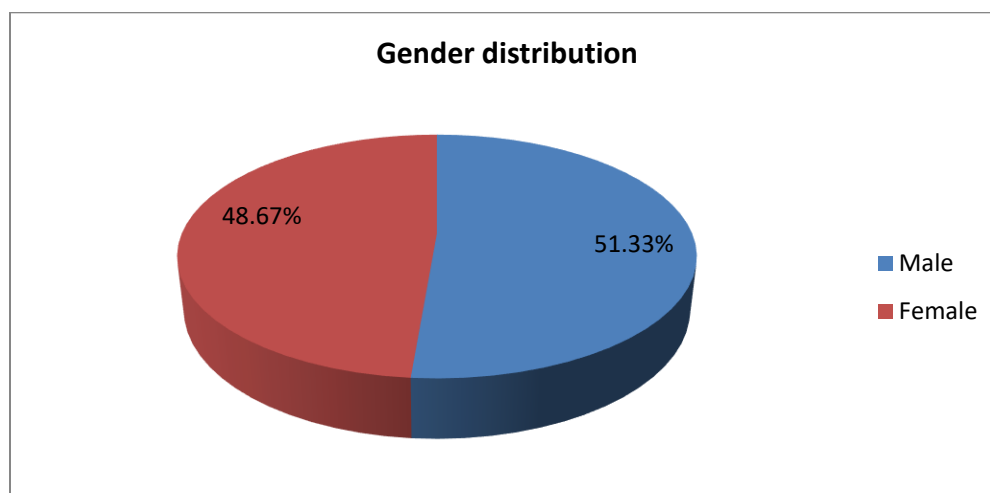
	AGE	EDUYRS	FEES	HHSIZE	INCOME
Mean	42.14667	13.08000	272.7667	4.980000	537.7333
Median	41.00000	13.00000	210.0000	5.000000	500.0000
Maximum	76.00000	21.00000	1000.000	13.00000	1500.000
Minimum	19.00000	7.000000	5.000000	1.000000	100.0000
Std. Dev.	14.62020	3.492120	230.4952	2.165842	292.3847
Skewness	0.406158	-0.008249	0.919299	0.789359	1.010159
Kurtosis	2.258918	2.203132	3.639596	4.370143	3.713591
Jarque-Bera	7.556629	3.970441	23.68454	27.31028	28.69312
Probability	0.022861	0.137350	0.000007	0.000001	0.000001
Sum	6322.000	1962.000	40915.00	747.0000	80660.00
Sum Sq. Dev.	31848.77	1817.040	7916077.	698.9400	12737829
Observations	150	150	150	150	150

It is imperative to examine the data before performing estimations so as to determine if the data is suitable to provide reliable results. The rules of thumb regarding skewness and kurtosis are; $-1 \leq skewness \leq 1$ and $kurtosis \cong 3$ respectively. All the variables satisfy the skewness condition. More-so, all the variables have a kurtosis coefficient which is closer to 3 except hhsiz

whose value exceeds 4. However, the Jarque Bera probabilities are all less than 0.05, implying data are normally distributed at 5%, except eduysr which is normally distributed at 10% significance level. We therefore safely conclude that the data is free from outliers and is normally distributed.

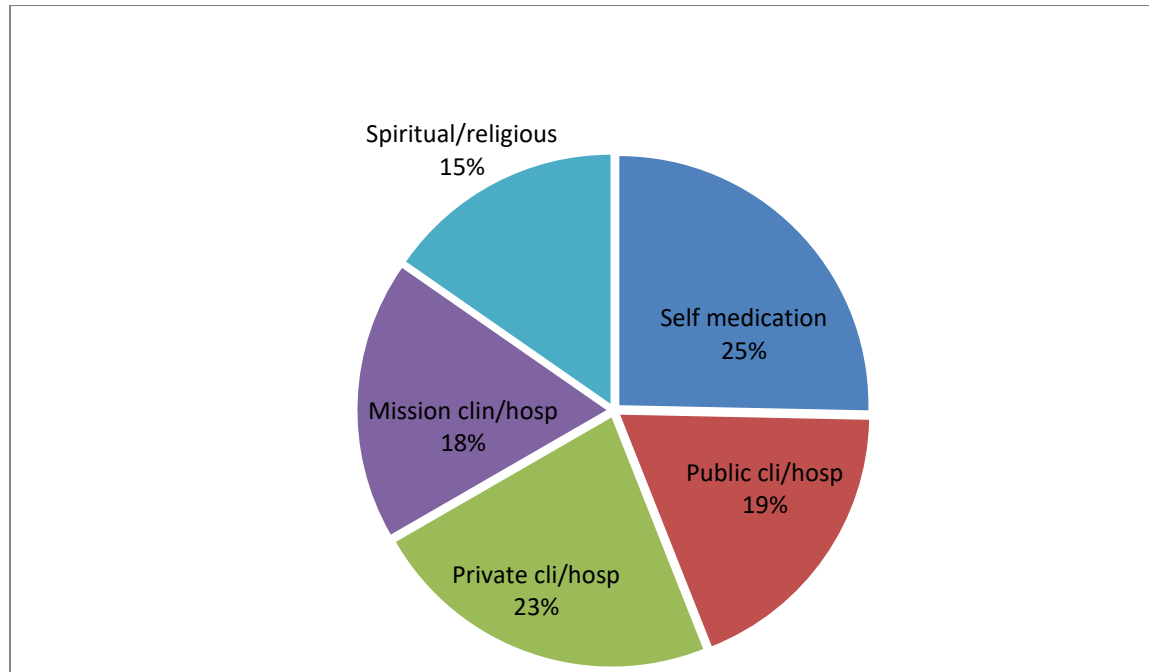
From table 2 above, the average age of the respondents was 42 years. This shows that the population interviewed was generally middle aged. This is justifiable since the study focused on people aged 18 years and above. The average schooling age was almost 13 years, which shows that on average, the people interviewed had at least attained Ordinary level. The average household income per month was \$537.73. The sample average household size was 4.98 persons. This translates to \$107.98 per capita per month, which is slightly greater than 2017 GDP per capita per month of \$95. This is expected since in general, the urban folks earn more than their rural counterparts. However, sample average household size is greater than the Harare urban household size reported in the 2012 census, which was 4 people per household, and this suggest that there has been a notable demographic transition since 2012. The average user fees that patients paid from their last use of health care services were \$230.50. This shows that accessing health care services in Zimbabwe generally involve paying some substantial fee, confirming the effect of the 1987 Bamako declaration that encouraged health care providers to at least recover cost of providing services.

Figure 7: Distribution of respondents by sex.



Out of the 150 people that reported being sick within the last 12 months, 73 of them were females while 77 were male. In percentage terms, the representation was 48.67% and 51.33% for females and males respectively. Thus the interview encountered more males who reported having fallen sick within the last 12 months than females. No effort was made to balance gender in the sampling hence the disparity.

Figure 8: Distribution of respondents by choice of health care services.



Out of the 150 people who reported having been sick within the past 12 months, the largest percentage, (25%), resorted to self medication. Information gathered from the survey highlighted that people have a tendency to try self medication first, before seeking health care services outside the family. 19% of the sample sought services from public providers and 23% from private for profit providers. Lastly, another 18% consulted mission clinics/hospital while 15% consulted spiritual/religious healers. While this may not be a true reflection of the national market shares of the providers due to limited sample and coverage of the survey, there is strong evidence to suggest that the public sector's relative share of patients continues to dwindle as predicted by Osika *et al.*, (2011). As Figure 8 shows, the market share of the public sector is only 19%. If this could be a representative of the Zimbabwean health sector, then the market share of the public sector is declining at an alarming rate.

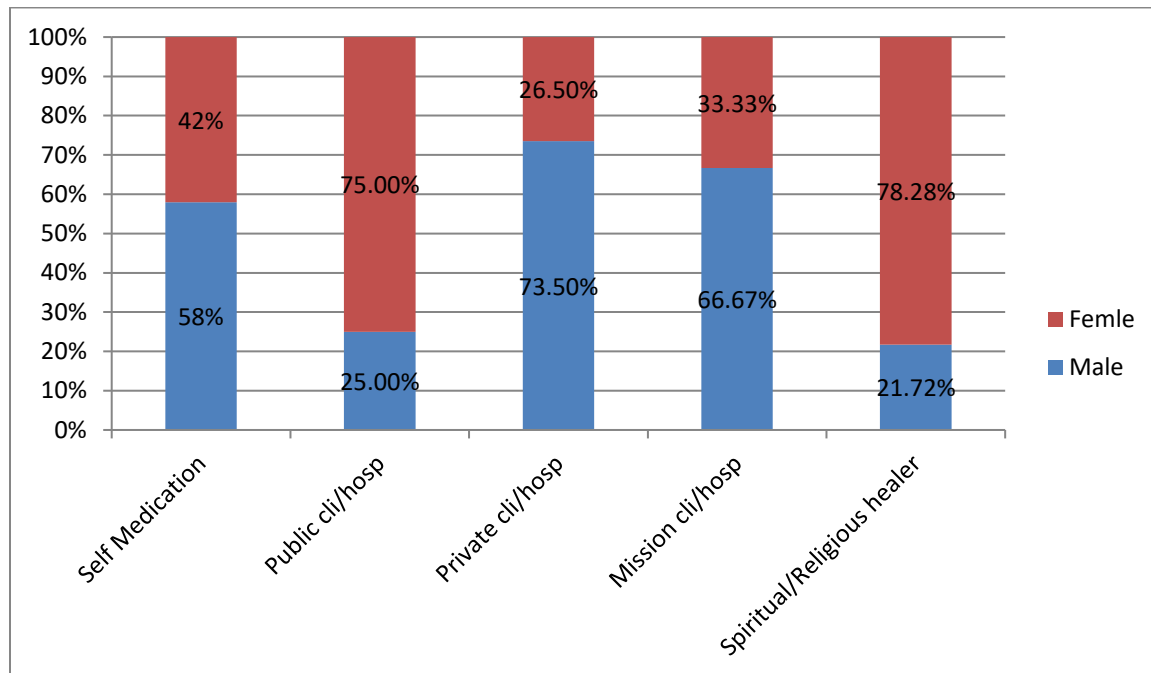
Figure 9: Distribution of choice of health care provider by gender

Figure 9 shows that more female patients seek medical services from public clinics/hospitals and spiritual/religious providers than their male counterparts. On the other hand, more men prefer self medication. Bertakis *et al.*, (2000) explained that men generally hesitate or procrastinate to seek medical health services outside the family. More men than women also prefer services from private providers and mission providers.

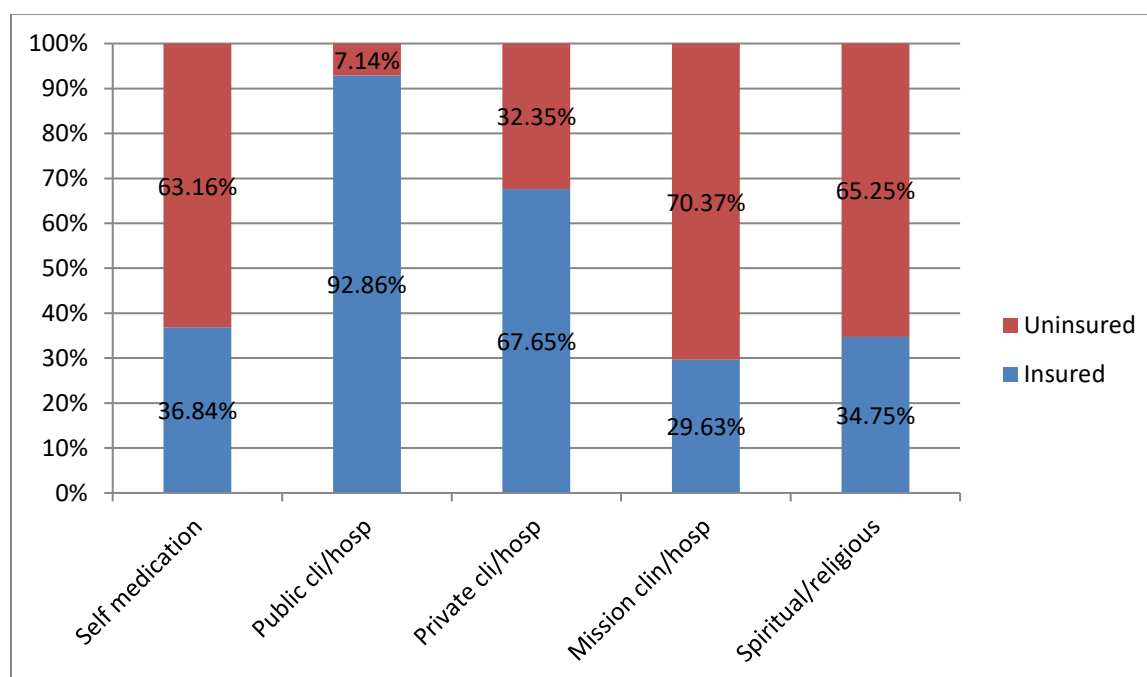
Figure 10: Distribution of choice of health care provider by insurance.

Fig 10 shows that a large proportion of uninsured people resorted to self medication and sought health care services from mission clinics/hospital and spiritual/religious healers. Most of the people who sought health care services from public clinics and private clinics/hospitals had health insurance cover.

Overall, almost 53% of the people interviewed have health insurance cover. This is far much greater than the 2016 reported national figure of medical insurance cover of 10%, hence this suggest that the majority of the rural folks have no health insurance cover. Thus the urban dwellers are less susceptible to catastrophic health expenditure⁵ as compared to their rural counterparts.

⁵ Catastrophic health expenditure results when out of pocket health expenditure gets so high that it eats on the budget of other necessities of life. The World Health Organization define it as when the health expenditure exceeds 35% of household income

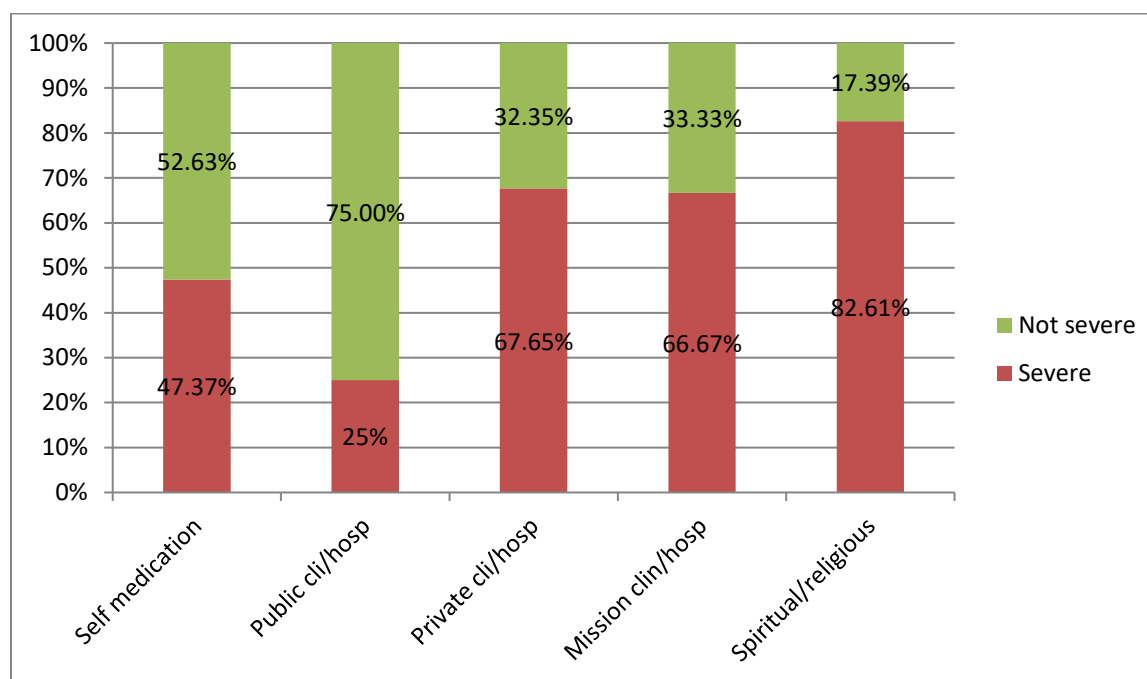
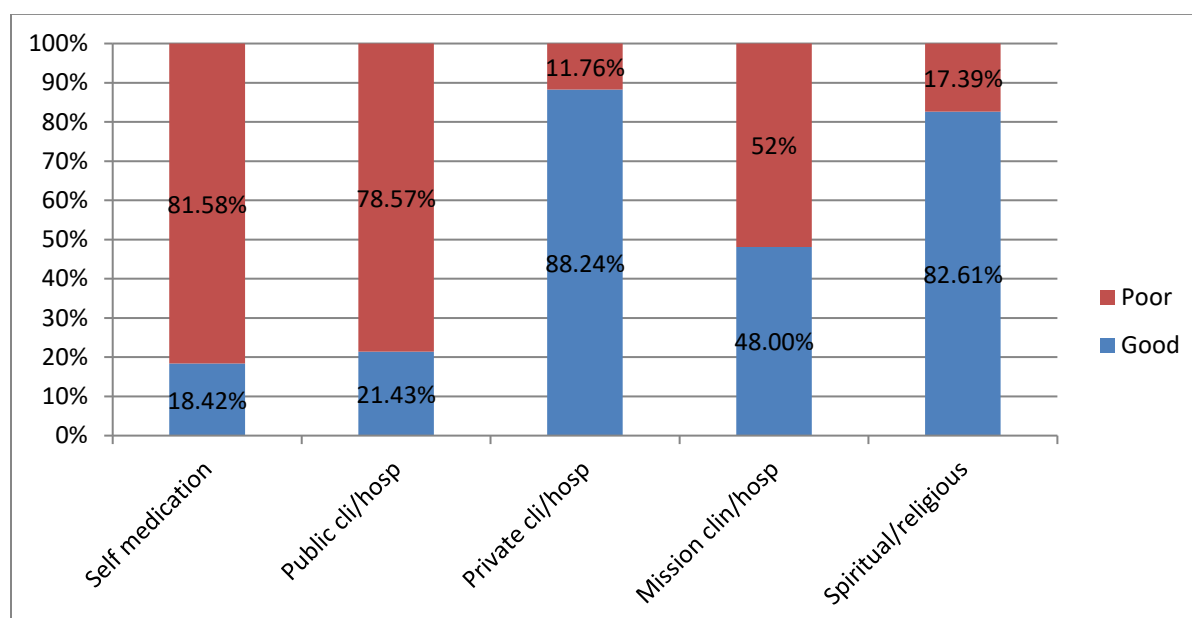
Figure 11: Distribution of choice of health care provider by (perceived) illness severity

Fig 11 shows that more people who sought self remedies and who demanded health care services from public providers perceived their health problems to be trivial. However, more people who sought medical services from private clinics/hospital, mission hospitals and surprisingly spiritual/religious healers perceive their health problems to be severe. This suggests that people trust that spiritual/religious healers are better than public health care providers in treating severe health problems.

Figure 12: Distribution of choice of health care provider by perceived health care quality.

A bigger proportion (81.58%) of people who opted for self medication reported that the perceived quality of self medication services is poor. A bigger fraction of those who sought health care services from public clinics/hospitals (78.57%) and mission clinics/hospitals (52%) also reported that they perceive the health services to be of poor quality. More of the people who demanded health care services from private clinics/hospitals (88.24%) and surprisingly spiritual/religious healers (82.61%) perceive the quality of services from these providers to be of good quality. This may explain why there is an incessant shift in demand for health care services away from the public provider towards the private health care providers.

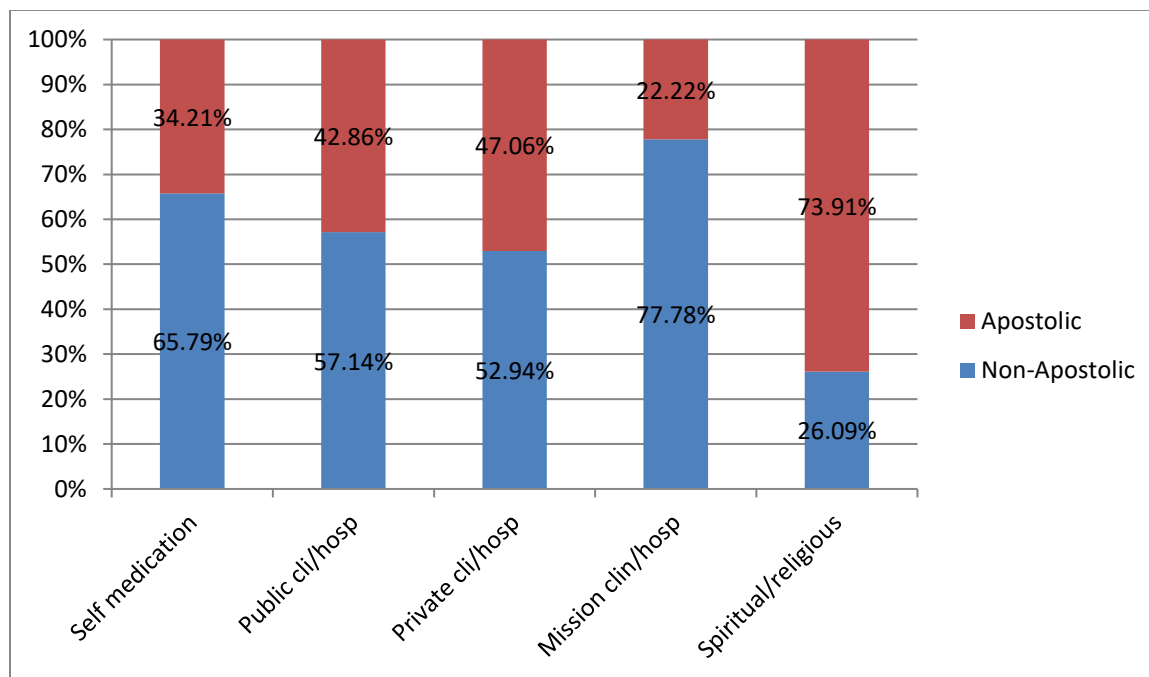
Figure 13: Distribution of choice of health care provider by religion

Fig 13 shows that more members of the apostolic sect consult spiritual/religious healers than non-apostolic members. However, more non-apostolic members seek services from public, private and mission clinics/hospitals. This suggests that the members of the apostolic sect are predisposed to seeking health care services from religious/spiritual healers than any other health care provider.

4.1.1 Multicollinearity Test⁶

Multicollinearity test provide a predictive link between variables. However, there is insufficient statistical dependence to reveal that a casual relationship exist, thus correlation does not necessarily imply causality. Data suffers from multicollinearity if the pair-wise correlation coefficient, in absolute terms, is ≥ 0.8 . The pair-wise correlation test result of the data for this research had a highest correlation coefficient of 0.48, which is smaller than 0.8, hence there is no evidence of multicollinearity between the variables.

⁶ See Appendix 3

4.1.2 Wald Test of Specification⁷.

The Wald test for specification was performed first with respect to equations. The chi-square p-values for the four equations are all less than 0.05. We may reject the null hypothesis and conclude that all the equations are necessary.

The Wald test was also performed with respect to predictor variables. Variables age, agesq and eduys were not significant, hence a restricted model was developed

4.1.3 Likelihood Ratio Test.

```
. lrtest ( Unrestricted ) ( Restricted ), stats dir df(12)
```

Likelihood-ratio test	LR chi2(12) =	8.85
(Assumption: Restricted nested in Unrestricted)	Prob > chi2 =	0.7157

The likelihood ratio test was performed to test whether removing the insignificant variables significantly improve the fit of the model by comparing the unrestricted and the restricted model. Since the chi-square p-value, 0.7157 is > 0.05 we cannot reject the null hypothesis hence we conclude that the restricted model is a better specified model, thus removing these three variables significantly improve the fit of the model.

4.2 Estimation and interpretation

The unrestricted model showed evidence of mis-specification. This was corrected by dropping some variables, which evidence from the likelihood ratio test showed that removing them improves the fit of the model, thus generating the restricted model. The restricted model showed no evidence of mis-specification. Therefore, interpretation and recommendations about this model were made.

⁷ See Appendix 3

4.2.1 Presentation of Restricted Multinomial Logit Results⁸

Table 4: Multinomial Logit (Restricted) model

Multinomial logistic regression

Number of obs = 150

LR chi2(32) = 302.89

Prob > chi2 = 0.0000

Log likelihood = -87.621568

Pseudo R2 = 0.6335

Variable	Public clinic/hospital	Private clinic/hospital	Mission clinic/hospital	Spiritual/Religious
Gender:	-2.201257***	.5698521	.7038964	-4.232***
Income	.0010439	.0085259***	-.0031977	-.0129601**
Household Size	-.4830686**	-1.420865***	-.2130577	.7433094**
Religion	1.210033	-1.111135	2.248704**	4.877467***
Insurance	2.660522**	-2.999182**	-2.761232***	-.3582481
Severity	-1.928194**	-.8032513	.5001954	1.734286
User-fees	.0037451*	.0082953***	.0100347 ***	.0100419***
Quality	-.1741151	1.918587**	2.11322**	3.841546***

***Significant at 1% level of significance. **Significant at 5% level of significance. *Significant at 10% level of significance. Not significant at 1%, 5% or 10% level of significance.

The results show that the model converged and stopped iteration at **-87.621568** of the log-likelihood, a value very close to zero. This indicate that the model was appropriate for the study

LR Chi2(32)

This is the log-likelihood ratio test that at least one of the coefficients of explanatory variables is

⁸ See Appendix 4

not equal to zero. The chi-square statistic for this model was 302.89. The number in parenthesis is the number of degrees of freedom, which is the number of explanatory variables (8) times the number of equation (4), excluding the base category equation.

Prob > chi2

This is the chance of getting a chi-square value of 302.89, given that : H_0 = All regression coefficients are equal to zero. The p-value of 0.000, significant at 1% indicate that at least one of the regression coefficients is not equal to zero.

Pseudo R2

This is the McFaden's R-squared which estimate the goodness of fit of the model. In this model, it is 63%, which is relatively high, implying that the model has some greater power to correctly predict all the outcomes.

4.2.2 Marginal Effects Results for the Restricted Model

Marginal effects were computed to provide a measure of effects of unit changes of the predictor variables on the probabilities of choosing a particular outcome of the dependant variable. Marginal effects are defined as the slope of the prediction function. They provide information about a change in predicted probabilities that is due to a unit change in the explanatory variable. In factor (dummy) variables, marginal effects inform us about the change in predicted probabilities as the variable changes from the reference category, hence it is the difference between predicted probabilities between a category and the reference category. Many authors argued that no valid conclusion can be made about the magnitude and direction of the relationship between explanatory variables and the independent variables in multinomial logit model without calculating the marginal effects (Bowen and Wiersema, 2004). Marginal effects are more useful than slope coefficients of discrete response models since marginal effects estimate the change in probability whereas slope coefficients simply give the relative odds ratio in favor of a particular outcome (Wooldridge, 2004). Marginal effect can be computed in two ways, namely marginal effects at the mean (MEMs) and average marginal effects (AMEs). MEMs measures the effect of a unit change of the explanatory variable from the mean on the dependant variable. AMEs measures the average effect of a unit change of the predictor variable on the dependant variable (Bowen and Wiersema, 2004). There is no consensus in literature as to

which type of marginal effects is better than the other. However, the major weakness of MEMs is that it is very unlikely that there is a sample unit that is average (at the mean) on all variables in the model whereas AMEs relies on actual values of the explanatory variables (and not on the means). Based on this argument, this study made use of AMEs rather MEMs.

Table 5: Marginal Effects Results⁹

Variable	Public clinic/hospital	Private clinic/hospital	Mission clinic/hospital	Spiritual/Religious Healers
Gender:	-0.1808023***	0.0776575*	0.1701461***	-0.1474634***
Income	-6.89e-06	0.0004602***	-0.0001584	-0.0003372**
Household Size	-0.0070402	-0.0597871***	-0.0034881	0.0278958***
Religion	0.0554308	-0.1144884**	0.0930877	0.1441967***
Insurance	0.2566584***	-0.1502745*	-0.1710241	0.0250227
Severity	-0.1341193***	-0.0052756	0.0377833	0.0547313
User-fees	-0.0000349	0.0001989**	0.0004401***	0.0001108*
Quality	-0.0960123*	0.0863546*	0.0793162	0.0967206**

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

***Significant at 1% level of significance. **Significant at 5% level of significance. *Significant at 10% level of significance. Not significant at 1%, 5% or 10%.

4.2.3 Discussion of marginal effects results for choice of health care model.

Gender

The marginal effect of gender is significant, at 1% on all health care providers, except private clinics/hospitals where it is significant at 10%. It is negative on public clinics/hospital and religious/spiritual healers. Being male decreases the probability of one seeking health care services from public clinics/hospital and religious/spiritual healers by 18% and 14.7% respectively. On the other hand, being male increases the probability of seeking health care services from private clinics/hospital and mission clinics/hospital by 7.8% and 17% respectively. These results depart from those found by Weller *et al.*, (2017) for rural Guatemala. Weller *et al.*, (2017) found that being male reduces the probability of seeking health care services from all

⁹ See Appendix 5

institutional providers, public, private and donor/mission providers and they concluded that men, generally dislike seeking health care services. However, this study found decreased probability for males to seek health care services from public clinics/hospital and religious/spiritual healers and increased probability on private and mission clinics/hospitals.

Income

The predicted marginal probabilities of income are insignificant on public clinics/hospitals and mission clinics/hospitals. The marginal probability of income on private clinics/hospitals is 0.0004602, significant at 1% level of significance. A \$1 increase in income increases the probability that a person seeks health care services from private clinics/hospital. On the contrary, the marginal probability for income on religious/spiritual healers is -0.0003372, significant at 5% level of significance. A \$1 increase in income reduces the probability of seeking health services from religious/spiritual healers by 0.03%. Thus the results predict that as income increases, people shun religious/spiritual healers, at the same time they demand services from private clinics/hospitals.

The study confirms a positive influence of income on demand for health from institutional providers, a phenomenon predicted by Grossman (1972). These results suggest that income constrains people from seeking health care services provided by institutional providers; as a result, they end up seeking health care services from non institutional providers. A number of studies also found similar results (Kesterton *et al.*, 2010; Mufunda *et al.*, 2012 and Tapera, 2014).

Household Size

The marginal effects of household size on public clinic/hospital and mission clinic/hospitals are not significant at all conventional significance levels. The marginal effect of household income on private clinic/hospital is -0.0597871, significant at 1%. It means a one person increase in household size reduces the probability of seeking health care service from private clinic/hospital by 5.98%. The marginal effect of household size on religious/spiritual healers is 0.0278958, significant at 1%. This means that a one person increase in household size increases the probability of seeking health care services from religious/spiritual healers by 2.8%. This result shows that as household size increases, the less likely they will seek health care services from private orthodox providers and the more like they seek services from private unorthodox

providers. These result partly converges with Muriithi (2013), who found out that an increase in household members is associated with a movement away from private formal health care providers towards public health care providers.

Religion

The marginal effect for religion is not significant with respect to public clinic/hospital and mission clinic/hospital. It is however significant on private clinic/hospital and religious/spiritual healers. The marginal effects of religion on private clinic/hospital and religious/spiritual healers are -0.1144884 and 0.14411967, significant at 5% and 10% respectively. Being a member of the apostolic sect reduces the probability of one choosing private clinics/hospital for health care services while it increases the probability of seeking health care services from religious/spiritual healers by 14.41%. This is quite not surprising since in Zimbabwe, most apostolic sects have been infamous for discouraging their members from seeking health services from public and private formal providers, but encourage them to consult spiritual/religious healers in their sect. These result also concurs with Maguranyanga (2011)'s findings. He found that members of the apostolic sect are discouraged from immunizing their babies at the conventional clinics or hospitals as dictated by the faith and religion.

Insurance

The marginal effects of insurance on mission clinics/hospitals and religious/spiritual healers were not significant, hence were not interpreted. However the marginal probability of insurance was significant on public clinics/hospitals at 1%, with a value of 0.2566584. Insured people have a 25% more chance of choosing the public amenities for health care than the uninsured. The marginal effect of insurance on private facilities is also significant at 10% but surprisingly negative 0.150275. The insured persons have a 15% less probability of choosing private orthodox facilities for health care needs. This is not expected and therefore represents a paradox. These results differ from Srivatava and Zhao (2008), who found that the insured have a more probability of seeking health care services from formal private care providers while the uninsured had a more probability of seeking health services from the publicly owned facilities.

However, these unexpected results may be explained by the impasse that exists between health care insurers and health care providers in Zimbabwe. In 2016, the association of private health care providers announced that they have ceased to accept medical aid cards and will charge cash

to all clients due to non-payment by insurers (VERITAS, 2016). From then, patients who were insured were turned away from private clinics and hospitals unless they could pay cash. However, the public clinics/hospitals have always accepted medical insurance cards.

Severity

The marginal effects of severity of illness were significant only on public clinics/hospitals, with a coefficient of -0.1341193, significant at 1% level of significance. Those patients suffering from perceived severe health problem have 13% less probability of seeking health care services from public facilities. The Zimbabwean public facilities have always been blamed for failing to deal with very severe complications. As a result, those who can afford seek services from private providers and abroad when health problems are perceived to be severe.

Quality.

The marginal effect for perceived quality on private clinics/hospitals and religious/spiritual healers are 0.0863546 and 0.0967206 significant at 10% and 5% level of significance respectively. Those who perceive quality of services in private hospitals and religious/spiritual healers to be good have 8.6% and 9.7% respectively, more chance of choosing private facilities and religious/spiritual healers for their health care services than those who perceive it to be poor.

Perceived quality is however not significant on mission clinics/hospitals. The surprising result is that the marginal effect for perceived quality is negative 0.0960123 for public clinics/hospitals, which is significant at 10% level of significance. This means that people who perceive the quality of services provided by the public provider to be good have a 9.6% lower probability of seeking services from public facilities than those who perceive it to be poor. While some researchers have found perceived quality to be significant in health choice decision (Kaija and Okwi, 2004 ; Halasa and Nandakumar, 2009), they all have found perceived high quality on a provider to be associated with a higher probability of that provider being chosen. This is directly opposite to the results of this study with respect to public health care provider in Zimbabwe, and this research could not establish any possible explanation.

Conclusion

The results from the study showed that in overall, all socio-economic variables that were investigated were relevant in influencing choice on least one health care provider. However, not all variables were relevant for each provider and those that were relevant for one provider were

not necessarily relevant for the other provider. Gender, insurance, severity and perceived quality were the relevant factors in determining whether or not people choose the public facilities. Gender, income, household size, religion, insurance, user-fees and perceived quality were the factors that determine whether the private facilities are chosen. Only gender and user-fees were relevant in determining whether or not mission clinics/hospitals are chosen. Lastly gender, income, household size, religion and perceived quality were the significant variable in determining whether or not religious/spiritual healers were chosen.

Undoubtedly gender, which is significant across all providers, is the major determinant of choice of health care providers. It clearly shows that gender preferences are different and very determinative in choice of health care provider. The perceived quality is another major determinant as it was not significant only in explaining choice of mission clinics/hospital. Surprisingly, user-fees had the least explanatory power on overall choice as it was only significant for private providers.

CHAPTER FIVE

CONCLUSIONS AND POLICY RECOMMENDATIONS.

5.0 Introduction

This chapter provides a summary of the findings of the study and proffer informed policy recommendations based on the findings of this study. Furthermore, this chapter will also highlight the challenges faced in carrying out this study and articulate identified areas of further research.

5.1 Summary of key findings and conclusions of the study

Sparse empirical investigations, inconclusive theoretical literature as well as the absence of Zimbabwe specific studies on health care choices motivated the undertaking of this study. The study sought to meet the research objectives through using a multinomial logistic regression and descriptive statistics on primary data collected from Budiro 4, Harare.

The major findings of the study were that the marginal probabilities of gender were significant in explaining choice of all the health care providers. Insurance explains only marginal probabilities for public and private providers. Marginal effects of severity were significant on only public services while quality of services was significant on public and private services. Marginal effects of income, household size and religion were significant on private and religious providers while user-fees and quality of services were relevant in explaining choice over private, mission and religious health care providers. Only gender was significant across all the health care choices. All the other variables were significant on explaining certain choices while at the same time they were not significant on explaining other choices. The surprising results were that as people perceive quality to be higher in public clinics/hospitals, their probability of choosing public facilities gets lower. More-so, having medical insurance cover is associated with a lower probability of choosing private formal facilities for health care services.

5.2 Policy implications and Prescriptions

The study found no evidence of the effect of age and education on choice of health care services. Moreso, there is evidence that the private sector, formal and informal constitute a significant proportion of the system as evidenced by its market share. While in 2015, at national level, the public sector constituted 65% of the health system, results from this study showed that it

constitutes only 19%. It is very pertinent that government should stop sidelining the private sector, especially the informal, but rather fully incorporate it into the system. Government may facilitate public-private partnerships to improve health care utilization, especially considering that the private sector may not have the machinery and proper facilities. This was done in Jamaica, in the mid-1990s, when the private providers were allowed to use publicly owned equipment, structures and buildings. As a result, health care utilization in Jamaica rose to almost 100% (Gertler and Strum, 1997).

The econometric results show that gender is the most important determinant of choice of health care services. While male patients have a higher probability of choosing private and mission clinics and hospitals, female patients have a higher probability of choosing public providers and religious/spiritual healers. There is considerable gender disparity in accessing health care services in Zimbabwe. Further research therefore has to be done to ascertain the causes of gender differences in choice of health care provider preferences. This will enable the providers to reduce gender disparities in health care access.

Increases in incomes are associated with higher probability of choosing private providers for services and a lower probability of choosing religious/spiritual healers. This suggest that income is the major constraint in accessing private facilities, hence people with lower income resort to religious/ spiritual healers. The government should also subsidize private health care services, much as the public services are subsidized, so that even lower income earners can afford formal health services. In 1985, formal health care utilization in Zimbabwe was 90%. This was attributed to the free health care for all policy that was adopted in 1980. It is very evident that a move toward free health care will increase formal health care utilization. This will also compliment the ongoing government effort to increase formal health care utilization.

Large household sizes are associated with a lower probability of choosing public facilities and a higher probability of choosing religious/spiritual healers. This may be explained by high burden ratios, and thinly spread resources in large families hence they may not afford public services facilities, thus they resort to religious/ spiritual healers. To increase health care utilization in public facilities, it calls for public provider to avail family size discounts for large families so as to accord them greater access to public health care services.

Members of the apostolic sect have a higher chance of choosing religious/spiritual healers and a lower probability of choosing private health care facilities. This calls for government to intensify awareness efforts that encourage apostolic faith members to seek formal health care services and discourage unscientific services from the supposed spiritual healers. The government of Zimbabwe has made considerable effort however, but with little success. The government, through the ministry of health, may need to take innovative targeted outreach programs that target apostolic faith members to improve health care utilization. A study by Ssali and Ssali (2017) demonstrated that target outreach programs that target particular minority groups are more efficient in ensuring that such groups access health care services. A number of outreach strategies to draw from exist, but a lot of conceptual work, however, has to be done to define outreach models and evaluate their effectiveness and relative efficacy in the Zimbabwean settings.

Insurance is positive and significant on public provider while negative and significant on private providers. This is attributable to the impasse that exists between health care funders and health care providers that saw insurance subscribers being turned away by private health providers. This calls for the health ministry or government to device ways to solve this anomaly in the sector. Government should make sure it puts in place strong statutory background that compels health care funders to pay for services that are rendered to their subscribers by both private and public providers.

Illness severity is negative and significant only on the public provider, suggesting that severely ill patients are less likely to choose the public provider. This is exacerbated by the fact that doctors in the public hospitals have a tendency of referring patients to the private surgeries. More-so, strikes and other forms of labour action are more pronounced in the public health system, hence very ill patients will not take the risk of dying in public hospitals. The public hospitals should improve efficiency by reducing waiting times, curbing staff industrial action, attending to emergencies and seriously ill persons and make sure that there drugs are available. This will increase the likelihood that seriously ill patients will choose public facilities.

User-fees are positive and significant on all providers, except the public provider. This is quite surprising. It is however evident that people in Zimbabwe attribute price to quality. As

supported the descriptive statistics, 78.6% of those who visited the public clinics/hospitals highlighted that they believe that the public provider services are of poor quality. This again calls the public provider to strengthen the quality of services that it offers so as to be competitive. Ironically, the marginal effects coefficient for perceived quality of service from the public providers is insignificant; hence we are not so sure if improved quality will guarantee an improved probability of the public service being chosen.

5.3 Limitations of the Study and Areas of Further Research.

Financial and time constraints limited this study to only one location, a high density urban location and sample size to only 150 units. To draw conclusion that fairly represent the Zimbabwean system, a larger sample size could have been chosen. In addition, limiting this study to only an urban setup introduces bias to the results of this study.

More-so, the empirical setup of this study was based on the assumption that only sick individuals seek health care services. This can be very untrue as it is possible that even health individuals also seek health care services. Therefore, further studies on health care seeking behaviour should also include people who had not been sick for a long while.

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APPENDICES

APPENDIX 1: Survey Questionnaire

Survey questionnaire

Date of data collection.....

Questionnaire I.D

House Number.....

Name of interviewee.....

UNIVERSITY OF ZIMBABWE



DEPARTMENT OF ECONOMICS

Good morning/ afternoon/ evening, my name is **Muneri, Ranganai**, a final year student at the University of Zimbabwe pursuing a **Master of Science Degree in Economics**. I am carrying out a research which is in partial fulfilment of the above mentioned program and the focus of the research is on **Choice of Health Care Services in Zimbabwe** (Case of Budiriro 4)

I would be glad if you spare some time to complete the questionnaire below. Your participation is greatly appreciated as it can help in understanding the background to choice and use of health care services.

The study is conducted to aid in policy formulation and not for personal use.

Your responses will be used for academic purposes only. Information provided is treated with utmost confidentiality.

Thank you.

Kindly give your responses by ticking the appropriate box as in the example shown below.

Marital Status (if married)	Married	<input checked="" type="checkbox"/>
	Divorced	<input type="checkbox"/>
	Single	<input type="checkbox"/>

SECTION A: DEMOGRAPHIC CHARACTERISTICS

<i>Number</i>	<i>Question</i>	<i>Response</i>	<i>Tick where applicable</i>
1	What is your gender?	Male	<input type="checkbox"/>
		Female	<input type="checkbox"/>
2	In which year were you born?	
3	What is your highest level of education? Please specify.	
4	What is your marital status?	Married	<input type="checkbox"/>
		Divorced/widowed	<input type="checkbox"/>
		Never married	<input type="checkbox"/>
5	What is your occupation? Please specify.	

	
6	What is the estimated monthly income/earnings for your household?	\$
7	How many people live within your household, include yourself?persons
8	To which church do you go? Please specify.

SECTION B: HEALTH CARE SERVICE UTILIZATION

9	When were the last time you got seek/ ill?	Within 12 months ago	
		More than 12 months ago	
10	How would you classify the health problem/sickness that you suffered?	Trivial	
		Severe	
11	Were you insured by any medical insurance when you got sick/ill?	Yes	
		No	
12	Where did you get medical services/treatment?	Private clinic/hospital	
		Public clinic/hospital	
		Mission clinic/Hospital	
		Spiritual healer/Traditional Healer	
		Self treatment	
13	How far (from your place of residence) is the health care provider where you got medical		

	services/ treated?km	
14	How much did you pay for the services/treatment?	\$.....	
15	What is your perception of quality of services that you received?	Poor	
		Good	

In brief, what are the main reasons why you choose a particular health care provider ahead of other health care providers?

.....

.....

.....

What are the major challenges that you face in trying to access that particular health care service provider?

.....

.....

.....

END!

Thank you for the time you spared to complete this questionnaire.

Appendix 2: Unrestricted Multinomial Logistic Regression

```
. mlogit choice age agesq i.gender eduyrs i.sev income hhsize i.rel i.insurc fees i.qual, base(1)
> nolog
```

```
Multinomial logistic regression      Number of obs   =      150
                                     LR chi2(44)        =     311.74
                                     Prob > chi2         =     0.0000
Log likelihood = -83.196479          Pseudo R2        =     0.6520
```

choice	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Self_medication	(base outcome)					
Public_cli_hosp						
age	.0137848	.1675604	0.08	0.934	-.3146275	.3421971
agesq	.000227	.0017753	0.13	0.898	-.0032526	.0037065
gender						
Male	-2.075789	.832189	-2.49	0.013	-3.706849	-.4447282
eduyrs	.1756071	.1207617	1.45	0.146	-.0610815	.4122957
sev						
severe	-2.29079	.9420913	-2.43	0.015	-4.137255	-.4443252
income	.0009301	.0019143	0.49	0.627	-.0028218	.004682
hhsize	-.4741543	.2536062	-1.87	0.062	-.9712133	.0229047
rel						
Apostolic	1.048775	.9919909	1.06	0.290	-.8954914	2.993041
insurc						
Have insurance	2.880288	1.143858	2.52	0.012	.6383681	5.122209
fees	.0038106	.0022312	1.71	0.088	-.0005625	.0081838
qual						
Good	-.2353195	.9154287	-0.26	0.797	-2.029527	1.558888
_cons	-3.141234	4.269486	-0.74	0.462	-11.50927	5.226805
Private_cli_hosp						
age	-.2901364	.2025361	-1.43	0.152	-.6870999	.1068272
agesq	.003237	.0022845	1.42	0.156	-.0012405	.0077146
gender						
Male	.783982	1.079173	0.73	0.468	-1.331157	2.899121
eduyrs	.2153562	.1454847	1.48	0.139	-.0697886	.5005009
sev						
severe	-.6982361	1.039435	-0.67	0.502	-2.735491	1.339019

income	.0084586	.0029039	2.91	0.004	.0027671	.0141501
hhsz	-1.591953	.4960217	-3.21	0.001	-2.564137	-.6197679
rel						
Apostolic	-1.031203	1.663578	-0.62	0.535	-4.291756	2.22935
insurc						
Have insurance	-2.570211	1.477847	-1.74	0.082	-5.466738	.3263151
fees	.0086381	.0029305	2.95	0.003	.0028943	.0143818
qual						
Good	1.750867	1.065355	1.64	0.100	-.3371908	3.838924
_cons	1.512339	4.562232	0.33	0.740	-7.429472	10.45415
Mission_clin_hosp						
age	-.0657408	.1782261	-0.37	0.712	-.4150575	.283576
agesq	.0007319	.0020945	0.35	0.727	-.0033733	.0048371
gender						
Male	.6776283	.8707967	0.78	0.436	-1.029102	2.384359
edyrs	.1368533	.1159567	1.18	0.238	-.0904178	.3641243
sev						
severe	.5335631	.7796893	0.68	0.494	-.9945998	2.061726
income	-.0033677	.0023757	-1.42	0.156	-.008024	.0012887
hhsz	-.1839336	.260481	-0.71	0.480	-.694467	.3265998
rel						
Apostolic	2.160776	.9262803	2.33	0.020	.3453005	3.976252
insurc						
Have insurance	-2.37662	1.085891	-2.19	0.029	-4.504928	-.2483119
fees	.009871	.0023686	4.17	0.000	.0052286	.0145133
qual						
Good	1.817929	.8653809	2.10	0.036	.1218141	3.514045
_cons	-1.693871	4.296298	-0.39	0.693	-10.11446	6.726718
Spiritual_religious						
age	.0245684	.2565584	0.10	0.924	-.4782768	.5274136
agesq	.0001571	.0028369	0.06	0.956	-.0054031	.0057174
gender						
Male	-4.714726	1.921838	-2.45	0.014	-8.481459	-.9479933
edyrs	-.0243614	.2379489	-0.10	0.918	-.4907327	.4420099
sev						
severe	1.44864	1.451853	1.00	0.318	-1.396939	4.29422
income	-.0124854	.0055916	-2.23	0.026	-.0234448	-.0015261
hhsz	.7503813	.3931412	1.91	0.056	-.0201614	1.520924
rel						
Apostolic	4.905569	1.405251	3.49	0.000	2.151329	7.65981
insurc						
Have insurance	-.2430921	1.275466	-0.19	0.849	-2.742959	2.256775
fees	.009457	.0031209	3.03	0.002	.0033401	.0155739
qual						
Good	3.804812	1.465588	2.60	0.009	.932312	6.677311
_cons	-7.346296	5.752248	-1.28	0.202	-18.62049	3.927902

APPENDIX 3: Diagnostic Tests

Multicollinearity Test

```
. pwcorr age gender income hhsize eduyrs insurc rel qual sev fees
```

	age	gender	income	hhsize	eduyrs	insurc	rel
age	1.0000						
gender	0.0299	1.0000					
income	0.1368	0.1123	1.0000				
hhsize	-0.0086	-0.0585	-0.4810	1.0000			
eduyrs	0.1465	0.0032	0.2050	-0.1799	1.0000		
insurc	-0.0042	0.1188	0.3647	-0.3428	-0.0281	1.0000	
rel	0.0856	-0.0467	-0.1953	0.3477	-0.0527	-0.1224	1.0000
qual	-0.0247	0.0934	0.2736	-0.1266	0.0843	0.0668	0.0867
sev	0.0291	0.0637	0.0865	0.0729	-0.1152	-0.0207	0.1148
fees	0.1101	0.0529	0.2352	-0.1468	0.1286	0.2276	-0.0398
	qual	sev	fees				
qual	1.0000						
sev	0.2018	1.0000					
fees	0.2149	0.0782	1.0000				

Wald Test

Wald tests for independent variables (N=150)

Ho: All coefficients associated with given variable(s) are 0

	chi2	df	P>chi2
age	2.649	4	0.618
agesq	2.261	4	0.688
1.gender	17.123	4	0.002
eduyrs	3.714	4	0.446
1.sev	8.639	4	0.071
income	16.662	4	0.002
hhsize	16.598	4	0.002
1.rel	14.175	4	0.007
1.insurc	15.851	4	0.003
fees	21.014	4	0.000
1.qual	11.401	4	0.022

```
. test [2]
```

```
( 1) [Public_cli_hosp]0b.gender = 0
( 2) [Public_cli_hosp]1.gender = 0
( 3) [Public_cli_hosp]0b.sev = 0
( 4) [Public_cli_hosp]1.sev = 0
( 5) [Public_cli_hosp]income = 0
( 6) [Public_cli_hosp]hhsize = 0
( 7) [Public_cli_hosp]0b.rel = 0
( 8) [Public_cli_hosp]1.rel = 0
( 9) [Public_cli_hosp]0b.insurc = 0
(10) [Public_cli_hosp]1.insurc = 0
(11) [Public_cli_hosp]fees = 0
(12) [Public_cli_hosp]0b.qual = 0
(13) [Public_cli_hosp]1.qual = 0
      Constraint 1 dropped
      Constraint 3 dropped
      Constraint 7 dropped
      Constraint 9 dropped
      Constraint 12 dropped
```

```
      chi2( 8) =    22.35
      Prob > chi2 =    0.0043
```

```
. test [3]
```

```
( 1) [Private_cli_hosp]0b.gender = 0
( 2) [Private_cli_hosp]1.gender = 0
( 3) [Private_cli_hosp]0b.sev = 0
( 4) [Private_cli_hosp]1.sev = 0
( 5) [Private_cli_hosp]income = 0
( 6) [Private_cli_hosp]hhsize = 0
( 7) [Private_cli_hosp]0b.rel = 0
( 8) [Private_cli_hosp]1.rel = 0
( 9) [Private_cli_hosp]0b.insurc = 0
(10) [Private_cli_hosp]1.insurc = 0
(11) [Private_cli_hosp]fees = 0
(12) [Private_cli_hosp]0b.qual = 0
(13) [Private_cli_hosp]1.qual = 0
      Constraint 1 dropped
      Constraint 3 dropped
      Constraint 7 dropped
      Constraint 9 dropped
      Constraint 12 dropped
```

```
      chi2( 8) =    25.36
      Prob > chi2 =    0.0013
```

```
. test [4]
```

```
( 1) [Mission_clin_hosp]0b.gender = 0
( 2) [Mission_clin_hosp]1.gender = 0
( 3) [Mission_clin_hosp]0b.sev = 0
( 4) [Mission_clin_hosp]1.sev = 0
( 5) [Mission_clin_hosp]income = 0
( 6) [Mission_clin_hosp]hhsize = 0
( 7) [Mission_clin_hosp]0b.rel = 0
( 8) [Mission_clin_hosp]1.rel = 0
( 9) [Mission_clin_hosp]0b.insurc = 0
(10) [Mission_clin_hosp]1.insurc = 0
(11) [Mission_clin_hosp]fees = 0
(12) [Mission_clin_hosp]0b.qual = 0
(13) [Mission_clin_hosp]1.qual = 0
      Constraint 1 dropped
      Constraint 3 dropped
      Constraint 7 dropped
      Constraint 9 dropped
      Constraint 12 dropped
```

```
      chi2( 8) =    24.20
      Prob > chi2 =    0.0021
```

```
. test [5]
```

```
( 1) [Spiritual_religious]0b.gender = 0
( 2) [Spiritual_religious]1.gender = 0
( 3) [Spiritual_religious]0b.sev = 0
( 4) [Spiritual_religious]1.sev = 0
( 5) [Spiritual_religious]income = 0
( 6) [Spiritual_religious]hhsize = 0
( 7) [Spiritual_religious]0b.rel = 0
( 8) [Spiritual_religious]1.rel = 0
( 9) [Spiritual_religious]0b.insurc = 0
(10) [Spiritual_religious]1.insurc = 0
(11) [Spiritual_religious]fees = 0
(12) [Spiritual_religious]0b.qual = 0
(13) [Spiritual_religious]1.qual = 0
      Constraint 1 dropped
      Constraint 3 dropped
      Constraint 7 dropped
      Constraint 9 dropped
      Constraint 12 dropped
```

```
      chi2( 8) =    22.27
      Prob > chi2 =    0.0044
```

APPENDIX4: Restricted Multinomial Logistic Regression

Multinomial logistic regression	Number of obs	=	150
	LR chi2(32)	=	302.89
	Prob > chi2	=	0.0000
Log likelihood = -87.621568	Pseudo R2	=	0.6335

choice	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Self_medication	(base outcome)					
Public_cli_hosp						
gender						
Male	-2.201257	.7934721	-2.77	0.006	-3.756434	-.6460803
sev						
severe	-1.928194	.8049551	-2.40	0.017	-3.505877	-.3505108
income	.0010439	.0017729	0.59	0.556	-.0024308	.0045187
hhsiz	-.4830686	.2433664	-1.98	0.047	-.9600579	-.0060793
rel						
Apostolic	1.210033	.8718703	1.39	0.165	-.4988015	2.918867
insurc						
Have insurance	2.660522	1.044909	2.55	0.011	.6125376	4.708507
fees	.0037451	.0021733	1.72	0.085	-.0005145	.0080046
qual						
Good	-.1741151	.8646699	-0.20	0.840	-1.868837	1.520607
_cons	.1624275	1.774709	0.09	0.927	-3.315938	3.640793
Private_cli_hosp						
gender						
Male	.5698521	.9991232	0.57	0.568	-1.388393	2.528098
sev						
severe	-.8032513	.9460084	-0.85	0.396	-2.657394	1.050891
income	.0085259	.0026173	3.26	0.001	.0033961	.0136557
hhsiz	-1.420865	.4448433	-3.19	0.001	-2.292742	-.5489882
rel						
Apostolic	-1.111135	1.398605	-0.79	0.427	-3.852351	1.63008
insurc						
Have insurance	-2.999182	1.314203	-2.28	0.022	-5.574973	-.4233901
fees	.0082953	.0026791	3.10	0.002	.0030443	.0135463
qual						
Good	1.918587	.9654929	1.99	0.047	.026256	3.810918
_cons	-1.325241	2.047109	-0.65	0.517	-5.3375	2.687018

Mission_clin_hosp							
gender							
Male		.7038964	.8388163	0.84	0.401	-.9401532	2.347946
sev							
severe		.5001954	.7446249	0.67	0.502	-.9592426	1.959633
income		-.0031977	.0021766	-1.47	0.142	-.0074639	.0010684
hhsiz		-.2130577	.2586473	-0.82	0.410	-.7199971	.2938818
rel							
Apostolic		2.248704	.8901273	2.53	0.012	.5040864	3.993321
insurc							
Have insurance		-2.761232	1.019005	-2.71	0.007	-4.758446	-.7640176
fees		.0100347	.0023228	4.32	0.000	.0054821	.0145874
qual							
Good		2.11322	.8293801	2.55	0.011	.4876651	3.738775
_cons		-1.256756	1.954438	-0.64	0.520	-5.087384	2.573873
Spiritual_religious							
gender							
Male		-4.232	1.625152	-2.60	0.009	-7.417239	-1.046762
sev							
severe		1.734286	1.344887	1.29	0.197	-.9016449	4.370217
income		-.0129601	.0054122	-2.39	0.017	-.0235678	-.0023525
hhsiz		.7433094	.3708383	2.00	0.045	.0164796	1.470139
rel							
Apostolic		4.877467	1.347095	3.62	0.000	2.23721	7.517724
insurc							
Have insurance		-.3582481	1.180699	-0.30	0.762	-2.672375	1.955879
fees		.0100419	.0030688	3.27	0.001	.0040273	.0160566
qual							
Good		3.841546	1.384189	2.78	0.006	1.128585	6.554507
_cons		-6.543258	3.14878	-2.08	0.038	-12.71475	-.3717617

APPENDIX 5: Marginal Effects:

Average marginal effects

Number of obs = 150

Model VCE : OIM

Expression : Pr(choice==Public_cli_hosp), predict(pr outcome (2))

dy/dx w.r.t. : 1.gender 1.sev income hhsz 1.rel 1.insurc fees 1.qual

	Delta-method					
	dy/dx	Std. Err.	z	P> z	[95% Conf. Interval	
gender						
Male	-.1808023	.0506167	-3.57	0.000	-.2800092	-.081595
sev						
severe	-.1341193	.0514279	-2.61	0.009	-.2349161	-.0333225
income	-6.89e-06	.0000959	-0.07	0.943	-.0001948	.000181
hhsz	-.0070402	.0141582	-0.50	0.619	-.0347898	.0207094
rel						
Apostolic	.0554308	.0500516	1.11	0.268	-.0426686	.1535301
insurc						
Have insurance	.2566584	.0483338	5.31	0.000	.1619258	.3513909
fees	-.0000349	.0001096	-0.32	0.750	-.0002498	.00018
qual						
Good	-.0960123	.0518254	-1.85	0.064	-.1975882	.0055635

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

```
. margins,dydx(*) predict(pr outcome (3))
```

```
Average marginal effects          Number of obs   =          150
Model VCE      : OIM
```

```
Expression      : Pr(choice==Private_cli_hosp), predict(pr outcome (3))
dy/dx w.r.t.    : 1.gender 1.sev income hhsize 1.rel 1.insurc fees 1.qual
```

		Delta-method				
		dy/dx	Std. Err.	z	P> z	[95% Conf. Interval]
gender						
	Male	.0776575	.0468374	1.66	0.097	-.0141421 .1694572
sev						
	severe	-.0052756	.0422506	-0.12	0.901	-.0880853 .0775341
	income	.0004602	.0000783	5.88	0.000	.0003067 .0006138
	hhsize	-.0597871	.0181175	-3.30	0.001	-.0952968 -.0242774
rel						
	Apostolic	-.1144884	.0542916	-2.11	0.035	-.2208979 -.0080789
insurc						
	Have insurance	-.1502745	.0491132	-3.06	0.002	-.2465347 -.0540143
	fees	.0001989	.0001011	1.97	0.049	7.98e-07 .000397
qual						
	Good	.0863546	.0520066	1.66	0.097	-.0155764 .1882856

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

Average marginal effects Number of obs = 150

```
Expression      : Pr(choice==Mission clin hosp), predict(pr outcome (4))
```

	Delta-method					
	dy/dx	Std. Err.	z	P> z	[95% Conf. Interval]	
gender						
Male	.1701461	.0500137	3.40	0.001	.072121	.2681712
sev						
severe	.0377833	.0528451	0.71	0.475	-.0657911	.1413577
income	-.0001584	.0001296	-1.22	0.221	-.0004124	.0000955
hhsiz	-.0034881	.017014	-0.21	0.838	-.036835	.0298588
rel						
Apostolic	.0930877	.0733428	1.27	0.204	-.0506615	.2368369
insurc						
Have insurance	-.1710241	.0485341	-3.52	0.000	-.2661492	-.0758989
fees	.0004401	.0001043	4.22	0.000	.0002357	.0006445
qual						
Good	.0793162	.0582477	1.36	0.173	-.0348472	.1934795

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

Average marginal effects Number of obs = 150

```
Expression      : Pr(choice==Spiritual religious), predict(pr outcome (5))
```

	Delta-method					
	dy/dx	Std. Err.	z	P> z	[95% Conf. Interval]	
gender						
Male	-.1474634	.0358585	-4.11	0.000	-.2177447	-.0771821
sev						
severe	.0547313	.0396974	1.38	0.168	-.0230743	.1325368
income	-.0003372	.0001405	-2.40	0.016	-.0006125	-.0000618
hhsiz	.0278958	.0097765	2.85	0.004	.0087341	.0470574
rel						
Apostolic	.1441967	.0450635	3.20	0.001	.0558738	.2325195
insur						
Have insurance	.0250227	.0301911	0.83	0.407	-.0341507	.0841961
fees	.0001108	.0000671	1.65	0.099	-.0000207	.0002422
qual						
Good	.0967206	.0431338	2.24	0.025	.0121799	.1812613

