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ANALYSIS OF EQUITY IN THE PATTERN OF HEALTH CARE UTILISATION IN SOUTH AFRICA.

By

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Declaration

I, OBOIRIEN KAFAYAT OLABIMPE, hereby declare that the work on which this dissertation is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

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Oboirien KO **Date**

This research work has been submitted for examination with my approval as the university supervisor.

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Mr O Okorafor **Date**

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DEDICATED TO MY HUSBAND AND KIDS

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Abstract

The study seeks to assess South Africa's health care utilisation pattern in the post apartheid era. This is based on the equity driven policy objectives of the health care system that were meant to have impact on individuals' health care utilisation patterns. A framework of factors influencing health care utilisation is outlined to explain the determinants of health care utilisation. It gives some insights into the socio-economic and racial differences influencing the use and choice of health care in South Africa. It also attempts to investigate how these factors have changed and whether the pattern of health care utilisation among those with higher need has changed over time. Four household survey data sets were used to collect information about individuals who reported illness/injury within the recall period for the different household survey years. Principal Component Analysis (PCA) was used to generate a socio-economic status (SES) index, which was used to divide the population into quintiles. A multinomial regression analysis was used to examine the determinants of choice of health care, while a binary logit model was used to explain the factors influencing the use of health care.

The results of the study showed that the African/Blacks are still the most underprivileged population group given their lower SES. The inequality in the distribution of wealth has also influenced use and choice of health care among individuals. The multinomial regression model showed that the influence of the explanatory variables on choice of health care was not consistent over the ten year period except for asset index (SES). Wealthier individuals are more likely to use private facility but less likely to use traditional/spiritual healer facility than the use of public facility over the ten year period.

The 2006 results indicated that, males are more likely to use private facility but less likely to use traditional/spiritual healer facility than public facility compared to females. The White population are more likely to use private facility but less likely to use traditional/spiritual healer facility than public facility compared to African/Blacks. Those

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with primary and secondary education are more likely to use private facility than public facility compared to those with tertiary education, while the association between level of education and the use of traditional/spiritual healer facility is insignificant. Adults are more likely to use private facility but less likely to use traditional/spiritual healer facility than public facility compared to children. As household members increases the less likely the use of private facility but its coefficient is insignificant for traditional/spiritual healer facility compared to public facility. Those covered by medical insurance are less likely to use private facility compared to public facility.

Coefficients for the elderly, marital status of household head, and individuals without formal education were insignificant with regard to the use of private facility compared to public facility. Similarly, the elderly, adults, marital status of household head, level of education, household size and medical insurance no longer determine the choice of traditional/spiritual healer facility over public facility given the 2006 results.

The logit model result showed that older individuals and gender have a consistent positive pattern with the use of health care while household size indicated a consistent negative association with use of health care. Race group (for White only), marital status of household head, level of education, SES and medical insurance indicated an inconsistent pattern over the ten year period. Given the 2006 results, adults and the elderly are more likely to use health care than children. Males are more likely to use health care than females. The Coloured, Indian and the White population are less likely to use health care than the African/Blacks. Those with no education are more likely to use health care than those with tertiary education. As household size increases the less likely the use of health care while those covered by medical insurance are more likely to use health care.

Lastly, the results revealed that higher utilisation among those with higher need suggest a more equitable health care utilisation pattern. This is because health care utilisation pattern tends to favour African/Blacks than other population groups, females than males and SES no longer determines the use of health care.

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List of Abbreviations /Acronyms

ANC	African National Congress
DoH	Department of Health
EAs	Enumeration Areas
GDP	Gross Domestic Product
GP	General Practitioner
GHS	General Household Survey
NHP	National Health Plan
PCA	Principal Component Analysis
PHC	Primary Health Care
PSU	Primary Sampling Unit
HIV/AIDS	Human Immune Deficiency Virus/Human Immune Deficiency Syndrome
OHS	October Household Survey
QALYs	Quality Adjusted Life Years
SES	Socio- economic status
SHI	Social Health Insurance
StatsSA	Statistics South Africa
WHO	World Health Organisation

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Chapter 1

1.1 Introduction

The South African health care system has witnessed series of changes before, during and after the apartheid system. Prior to 1994, the health policy and legislation of the colonial government was geared towards maintaining economic and political power for the minority White population (Chetty, 2007). This created a racially stratified society where discrimination, disparities in socio-economic status and health care access manifested in huge inequities in the health system.

The health system was fragmented, with fourteen different departments of health. There was one national health department, three "own affairs"[1] departments serving Coloured, Indian and White population groups and ten "homeland" health departments for the Black population. This increased disparities and variations in health care resource allocation among the existing health departments. The departments serving the White population were well resourced and the White population had better access and use of quality health care services (Charrasse-pouele and Fournier, 2006). However the underprivileged[2] population groups especially the Black majority had poor access to health care which resulted in huge burden of diseases. The burden of diseases brought about variations in the health status among individuals which were reported between rural/urban boundaries and across the socio-economic status (ibid).

The health system also lacked primary health care strategies (McIntyre *et al*. 1995), as the provision of health care was biased towards curative services. This resulted in a strong emphasis on standardization of hospital care, professionalism of health personnel and a large scale use of advanced technological equipment to suit the health needs of the minority white population (Van Rensberg, 2004).

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[1] Own affairs is used to denote the departments that were responsible for the administration of the Coloured, Indian and White population groups, while the black population departments are referred to homelands during apartheid.

[2] Underprivileged refers to all population groups who are socially, politically and economically underserved in terms of access and use of health care services

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On the other hand, an increase in the agitation among the black group led to the enactment of the Health Act 1977(South African Health Review, 1995).The Act sought to address the imbalance in the health care system by establishing a national co-ordinated health care policy. The act was meant to co-ordinate the activities of the existing health department to improve the health care needs of the population.

Post Apartheid Era

A number of programmes and policies were put in place by the new elected democratic government that took over in 1994 led by the African National Congress (ANC). These programmes and policies were meant to address the inequities entrenched in the health care system. The first programme was the Reconstruction and Development Programme (RDP). The RDP initiated a multisectoral framework for development of the new South Africa incorporating all sectors of the economy into the development programme (ANC 1994a). The health sector was given a relatively higher priority in the overall design of its programmes, thus equity goals were seen as integral part of the overall political environment.

The second was the National Health Plan (NHP) for South Africa which developed a more specific framework that perceives health as an important determinant of socio-economic development for the country (ANC 1994b). It proposed a Primary Health Care (PHC) approach in order to improve health care delivery across geographic and racial levels. The objectives of the PHC approach as proposed by the ANC was in line with the recommendations of the Alma Ata declaration of 1978, (WHO, 1978). One of its objectives was to increase utilisation of health care by incorporating exemption policy on user fees. Women and children under six years were specified as potential beneficiaries. To ensure that some other socio-economic conditions did not hinder this objective, education, employment, water, sanitation and housing were incorporated into the NHP (Van Rensberg, 2004). For instance improved access to water and sanitation (among many of the broader social sector policies) were specifically initiated based on their likely positive impact on health status (*ibid*).

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Thirdly, the assurance of drugs in the public facilities was also put in place through the White Paper for the Transformation of the health system in 1997, since poor access to drugs could discourage prompt health seeking behaviours (National Department of Health, 1997).

Whilst the private health sector advanced in effective health care delivery, the increasing demand on the public health care posed huge challenges. The public health care sector was faced with capacity constraints in terms of its human and material resources, due to the large demand by majority of the underprivileged population (McIntyre and Gilson; 2002). Nevertheless, there is a significant difference in the quality of services within the health care sector, as long waiting times and poor morale by health care personnel discouraged the use of public health care services as compared to the private health sector (ibid). To address these constraints, the National Health Act of 2000 and 2003 was enacted to establish and regulate a national health system which incorporates private and public providers of health care services (Republic of South Africa, 2004). The commitment of government to regulate the national health system and provide uniformity of services to those in need across the country is the main objective of these Acts. To achieve this, all members of the private medical insurance were exempted from free health care services in order to ensure cross subsidisation of funds for better public health care service delivery.

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The most often emphasized objective of health policy in South Africa over the decade has been to increase access to health care services for individuals (ANC, 1994b; National Department of Health, 1997; Republic of South Africa, 2004). This has taken different dimensions; one is through better geographic access by increasing health care facilities in the rural areas where the poor reside. Another dimension is through fees exemptions, to reduce financial burden on the underprivileged individuals. Although the above initiatives are recommendable, however access to health care is not the only determinant of health care utilisation. Whilst access is an important determinant of supply of health care, utilisation of health care depends on both supply and demand of health care. The

demand for health care is a function of individual characteristics that reflects in the tastes and preferences to seek health care. Individual tastes and preferences are associated with their socio-economic status (SES) which could influence their varying utilisation of health care based on need. Differences in SES may then result in inequity in the pattern of health care utilisation in the country.

Health seeking behaviour has been used to investigate health care utilization pattern among individuals. This helps in understanding the pattern of health care choices and determinants of health seeking behaviour among individuals and within population groups. The most often reported evidence within and among countries is that an equitable health care distribution reduces disparities in health care use significantly (Gulliford, 2003). Given the South African context, possible application of the notion of equity in health care utilization can help determine whether equity based health policy objectives in the country have achieved their objectives. This is because a study on health care utilisation can reveal the pattern of disparities that may be associated with inequities in income and socio-economic distribution among individuals or among the population groups in the country.

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1.2 Statement of Problem

Although government has clearly stated equity in health as a priority, there still remains inequity in access and utilisation of health care services (McIntyre *et al*. 2006; Wadee *et al*. 2003). Therefore the key challenge to the South African health system remains on how to further reduce the inequities in access to and utilisation of the health care services. It would be necessary to emphasize that after more than 10 years of the government's commitment to addressing equity, there are still substantial inequities in the pattern of health care utilisation. Thus, it is important to find out why this has remained.

1.3 Objective of the Study

The overall objective of the study is to assess health care utilisation pattern in the post apartheid era.

Specific objectives

- To determine the factors influencing utilisation or health seeking behaviour over time
- To investigate how these factors have changed over time
- To determine whether the pattern of health care utilisation among those with higher need has changed over time
- Based on the results of the study, propose recommendations on how to promote a more equitable pattern of health care utilisation

1.4 Justification of Study

In South Africa health care policies have shifted from emphasis on hospital based care to primary health care in order to respond to the inequities in access and utilisation of health care delivery. Studies have been conducted on the inequities in health care utilisation (Wadee *et al*. 2003; McIntyre and Gilson2002; McIntyre *et al.* 2006; Van Rensberg *et al.* 2004; Foster 2005). However no study has investigated the trends in the pattern of health care utilisation from 1994 up to date in order to assess equitable access and utilisation of health care system. Equitable health care provision and access to health care have been reported to be important in assessing the distribution and utilisation of resources (Culyer and Wagstaff, 1993). The South African National Health Act of 2000 and 2003 has clearly stated that the uniformity of provision and right to access health care services across the country will be promoted (Republic of South Africa, 2004). This policy statement stipulated a rationing criterion for access especially among the vulnerable groups. This is to ensure that the influence of variations in socio-economic status on health service utilisation patterns is minimised. Investigating the pattern of utilisation across different socio-economic groups will provide a good insight into how effective equity-promoting policies have been.

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1.5 Outline of the Study

Chapter 2 describes the demographic and socio-economic conditions in South Africa. It also describes some of the equity based policies and legislations by the post-apartheid government that were meant to have impact on health care utilisation in the county.

In Chapter 3, theoretical literature on the key concepts used in the study is reviewed. The concepts identified are equity, views on equity, principles of equity, equity in health and equity in health care. Need for health care and the differences between utilisation and access were also discussed. This chapter also contains a review of empirical literature on health care utilisation.

Chapter 4 describes the conceptual framework. It presents the view of the study on how to assess factors influencing health care utilisation.

Chapter 5 describes the methods and approaches used in the study. It presents the sources of data and variables used in the study. It also describes how asset index was generated through the Principal Component Analysis (PCA) due to unavailability of income variable. Lastly the chapter specifies the model, followed by presentation of details on data analysis and the limitations to the study.

Chapter 6 describes the results of analysis. The chapter also provides descriptive statistics of data used. Data analysis involved both a multinomial regression model and a binary response model to explain the factors influencing health care utilisation.

Lastly chapter 7 describes the conclusion made from the study results. It also presents some recommendations that could inform policy in order to promote a more equitable health care utilisation pattern in South Africa.

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Chapter 2

2.1 Introduction

This chapter gives a brief overview of the demographic and socio-economic conditions in South Africa. It also describes the general structure of the public health care sector, and policies within the health care system that were designed to ensure and promote equity in the access and utilisation of health care. Thus the chapter to helps explain the context in which equity in health care utilisation should be understood.

2.2 General Information on South Africa

In 2005, the South African population was estimated at 47.4 million people (WHO, 2006). According to the World Health Statistics 2006, annual growth rate in the country is estimated at 1.2%. The country has nine provinces in total with different racial groups constituting each province. It has a complex demographic profile due to the heterogeneous composition of the population. The racial structure of the population and the huge differences among the racial groups has resulted in the country being regarded as one of the most unequal societies in the world (Fallon and Silva, 1994). It has also been rated as having the second most unequal distribution of income in the world (May, 1998). There are also disparities in access to basic services by geographic areas. It was reported in 2005 that 58% of the population reside in the urban areas while over 40% of the population reside in rural settings (WHO, 2006). Access to improved essential social amenities such as water and sanitation varies between rural and urban settings. For instance in 2002, 86% of urban residents had access to improved sanitation compared to only 44% of the rural dwellers. In addition over 40% of the rural population still uses solid fuels compared to only 7% of the urban population (WHO, 2006).

There is also poor health indicator within the population given a life expectancy at birth of 47 years for males and 49 years for females. The increasing rate of HIV/AIDS

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infection and other related opportunistic diseases coupled with poverty has also contributed to the poor health status among individuals.

South Africa's health care expenditure has risen since 1995. Table 1 below shows the trend in health care expenditure as a percentage of annual GDP between 1995 and 2006. South Africa's health care expenditure of the annual GDP compares favourably with many other developed countries (Fallon and Silva, 1994). However, inequitable distribution and access to health care resources is still a key challenge within the country.

Table 1: South Africa's health care expenditure between 1995 and 2006.

Year	1995	1999	2002	2006
Total expenditure on health as % of GDP	7.9	8.7	8.3	8.6

Source: WHO, (2008)

2.3 Macroeconomic Reforms and the Health Sector

After the change in government from the apartheid system in 1994, the government of South Africa embarked on restructuring the economy through a range of both broad macroeconomic policy and health care system specific structural framework. This structural framework was executed under a unified health care system in which the Department of Health (DoH) has been the main coordinator of the policy making process. Given the inequities within the system, the policies and programmes were mainly committed to redressing inequality in South Africa. Notable among the government programmes were the Reconstruction and Development Programme (RDP), the ANC National Health Plan (NHP), the 1997 White paper for the Transformation of South Africa and the National Health Bills 2003/4. The RDP (1994) and the NHP for South Africa served as the basis of the socio-economic framework to address the inequities in the system. These programmes were later supported by the 1996 constitution and the associated Bill of Rights (Wadee et al, 2003).

The 1997 White Paper for the Transformation of the Health System (among other policies and legislation) emphasised a universal right of access to equitable health care. It was based on developing a unified health system capable of delivering quality health care to all. This was also guided by a Primary Health Care (PHC) approach which was meant to

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provide comprehensive health care to the population (National Department of Health, 1997). Emphasis was on universal accessibility especially reaching the poor, under-served (rural and peri-urban), women and children who are seen as vulnerable (Republic of South Africa, 2004).

The design of a unified health care system was to ensure that the national, provincial and health districts levels play distinct and complementary roles. The national level will ensure the implementation of the health policy and issue guidelines to the lower levels for effective implementation. The major role of the national level is to promote, protect, improve and monitor the health of the population. The provincial level is obliged to execute similar roles but within their respective provinces. They are to ensure that the health districts under their administration comply with the principle laid down in the policy. The health district is seen as the major point of implementation in order to execute the primary health care approach. Increasing access to primary health care, providing quality essential drugs in the health facilities were also included as part of the implementation process. The policy requires a participatory approach, involving Non Governmental Organisations (NGOs), the private sector and the communities (Republic of South Africa, 2004).

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2.4 Overview of Equity based Health Care Policies

Measures to promote equity in health care utilisation included the establishment of health care financing policies that will promote comprehensive PHC delivery. These include the free health care policy/ user fee structure, Medicines and Related Substances Control Acts, Medical scheme Acts, the National Health Bill and Social Health Insurance.

2.4.1 Exemption Policy within the User Fee System

User fees refer to the charges levied on users of public sector facilities at the point of service. The aim is usually to recover some of the costs of providing such services (South African Health Review, 1994).There is a general principle guiding the fee collection within the public health care system. The principle used in the collection of user fees in South Africa is differentiated according to income levels. Patients within the higher income category and those with medical insurance are seen as private patients. Private

patients have a choice of using private health care since they have the purchasing power, but they are encouraged to use public sector because of their contribution to public health care financing. While individuals of higher income can afford any health care provider, poor individuals cannot due to limited income.

The fee structure in South Africa has an exemption plan which excludes the vulnerable individuals from paying for public sector health care services. In May 1994, the existing fee structure in the country was revised to include free health care services for children under 6, pregnant and nursing mothers, elderly people, disabled people and certain categories of the chronically ill individuals.

Over the years free health care policies has been revised to include other individuals in the exemption plan. For instance the National health Act No. 61 of 2003/4 further states that children under 13 and all individuals except those on medical insurance are eligible for free health care services in public facilities (Republic of South Africa, 2004). The exemption policy within the public sector is meant to reduce the financial barrier of the poor to utilise health care. This policy can help to promote access for the poor and increase utilisation, only if equity in health care delivery has been achieved to a significant level.

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2.4.2 The Medicines and Related Substances Control Acts

The 1997 medicines and Related Substances Control Act gave legislative authority to the policy objectives stated in the 1996 National Drug Policy. It was designed to enable government to undertake a variety of activities that would enhance the supply of more affordable medicines. Measures put in place to achieve this include parallel importation of imported medicines, generic substitution of off-patent medicines and the establishment of a pricing committee to introduce a pricing system for all medicines in South Africa. The intention was to enable the regulation of the pharmaceutical manufacturers from placing exorbitant prices on drugs. Further, the Act intends to ensure the availability of essential drugs and testing of its utility, particularly with regards to the national antiretroviral programme.

2.4.3 The Medical Schemes Acts (1998)

This is meant to promote equitable access to health care in the private sector. The Act is to regulate risk-rating and the exclusion of membership on the basis of age, gender and state of health. The Act, introduced a prescribed set of minimum benefit. This is to prevent the practices of the private pre-payment medical scheme industry which undermine equity. For instance, the Act was able to limit the burden placed on the public sector by requiring insurers to cover a package of prescribed minimum benefits whether provided in the private or public sector. This helped to prevent the dumping of insured patients whose benefits are overused in the public sector (Wadee et. al 2003). However there are still debates on the extent to which the Act will promote uniformity in service delivery between the private and the public health care sector (Forman et al 2004).

2.4.4 The National Health Bill and Social Health Insurance

The National Health Bill No. 32 of 2003 was to provide a framework for a uniformed health system. It made provisions that could have significant influence on equity in health care (Republic of South Africa, 2004). These provisions include the protection of rights and duties of both users of health care and health personnel. It also stipulated the functions of national, provincial departments and district health systems. In order to achieve a uniform health care system based on decentralised management. Equity, efficiency, good governance and high standard research should be promoted. However within the parliamentary process, objections have been raised about some contents of the bill. This has hindered the actual promulgation of the bill and its consequent implementation (Forman et al. 2004).

The Social Health Insurance Act has also been proposed to reform the health sector but has not since been implemented (ibid). It is expected to serve as a parallel health care reform to the Medical Schemes Act. It is to encourage a growth in low cost health insurance coverage among low-income groups. It will also serve as a mechanism for diverting fees from the private patients using public health care services but who fail to pay for services because of inefficient revenue collection systems (Doherty et al. 2000). Proponents of the Social Health Insurance (SHI) have argued that it will favour the poor as risk equalisation mechanism will ensure that the low income earners are within the

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SHI while the high income earners remain in the medical aid schemes. Also it will promote cross subsidy from the private sector to the public sector.

In summary after over 14 years of democratic rule after the apartheid system, lots of policies and programmes by government had been put in place to address the inequities within the health care system. Significant progress had been made to reach further to the rural areas as well as the vulnerable individuals. However lots of challenges are still underpinning the efforts to achieve equity in health care utilisation especially among the vulnerable groups. This has been attributable to the politics and policy issues within the parliamentary process as conflicting interest within the system is affecting implementation of these policies (McIntyre and Gilson 2002; Chetty, 2007).

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Chapter 3: Literature Review

In this Chapter, literature on equity, need (for health care) and health care utilisation will be reviewed. Issues related to equity such as principles of equity, various perspectives of equity and the debate on equity in health and health care will be discussed. Need for health care as a criterion for the distribution of health care resources is also reviewed. A review on different methods of measuring equity in health care utilisation will also be discussed. In addition, health care utilisation is defined and some theoretical literature on the concept is presented. This is followed by a review of empirical studies on health care utilisation in order to determine how other studies have investigated or explain the factors that influence health care utilisation. The chapter concludes with summary/discussions of the literature reviewed to help inform on the appropriate approach and methodology that will be used later in this study.

3.1 What is Equity?

Equity refers to fairness in the distribution of goods such as health care among individuals (Williams and Cookson, 2000; Mooney, 1994; Whitehead, 1992). According to Sen (1973) fairness in distribution is central to the definition of equity and not equality of distribution. Although the concepts "equality" and "equity" are often used interchangeably, the concepts have two distinct meanings. Equality refers to sameness while equity means fairness or just. Equality in distribution is allocating the same proportion of a phenomenon to different beneficiaries. Equality in distribution can be equitable or inequitable. The distribution of immunisation vaccines can be seen as inequitable when beneficiaries (i.e. infants) cannot access the services due to financial or (and) travelling costs (that will be borne by their parents) to PHC centres. These barriers to health care access may arise if PHC centres are not close to the community or parents or they cannot afford travelling costs to PHC centres due to their lower SES. It is more objective to determine equality in this instance because every infant is eligible to same proportion of immunisation services but to say that the distribution is (in) equitable is subjective. It can be argued that inasmuch as there is access to immunisation services, it is left for individuals based on their taste and preferences to or not to utilise the services. On the contrary, those in favour of equity in health care distribution will argue that it is

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not sufficient to make available health care services without putting into consideration potential factors that can bring about disparities. These may arise as a result of SES, inadequate information about the services, or the location an individual resides in. These differences can make equal distribution of a phenomenon unequal or even unjust. According to Braveman (2003), inequalities will be seen as inequities when those of lower SES cannot utilise health care because their SES put them at further disadvantage. The decision to determine how unfair or unjust a particular phenomenon has been distributed has raised a lot of debates around equity in health care. This has been discussed within the theory of social justice. Equity in health care is recognised as being normative or subjective in nature, as a number of equity perspectives have been held by policy advocates and authors in order to help determine the distribution of resources (Peter, 2001).

3.1.1 Health Equity and Theories of Justice

The perspectives to equity arose as a result of the subjective nature of the concept and normative judgements that is required. The premise for any theory of social justice is that there is some good that can be (re)distributed, that something can be changed about the situation that is considered unjust. It assumes that for any (re)distribution of resources (health care for example), fairness and justice must be considered among individuals. Some of the different views of social justice that can be identified are: the utilitarian, libertarian, egalitarian and maximin view.

Utilitarianism: This view purports that pleasure should be promoted and pain avoided as much as possible when distributing a particular phenomenon. This is measured cardinally as a number of utils and considers the aggregation of individual's happiness. It is based on the theory of rational behaviour under risk and uncertainty as such interpersonal cardinal utilities is measurable (Olsen, 1997). It is said to be outcome oriented because it focuses on maximising the sum of individual utilities. It has often been criticized for ignoring individual freedom since only consequence is desired, i.e. there is no concern for justice on individual level. In distributing health or health care the utilitarian view measure health gain by using, for example, the total Quality Adjusted Life Years (QALYs) gained from a possible model of health care distribution. In the distribution of

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health, emphasis is on capacity to benefit rather than initial health levels. So the desired distribution of health care would be on the propensity to improve health without consideration for initial health levels. Thus ignoring the fact that initial health levels is an important indicator of need.

Libertarian view: This purports that the economic and social structures within the society should maximise individual freedom, by delivering health care through market oriented providers. This view gives limited role to government, by leaving the distribution of health care to individuals according to their willingness or ability to pay (Maynard, 2007). In other words, all individuals have freedom to choose their health care providers inasmuch as they all have the purchasing power. The main criticism of this view is that those with limited purchasing power due to poverty will be affected. The poorer members of the population will be disadvantaged with regard to accessing health care and they are the ones that need it most.

Egalitarianism: This view promotes equality of opportunity according to need. It entails the principle that everybody should have equal opportunity to good health care that can improve the health or health gains of individuals (Peter, 2001). The distribution of health should be determined by social judgements on need. The implication of the social judgements on need will be based on how need is defined. Need may relate to the SES of individuals that can influence access or utilisation of health care. It may also relate to the differences in their health status within the population. When considering health care need that is related to SES among individuals, egalitarianism will promote the notion that individuals, irrespective of their socio-economic status or ability to pay should have equal opportunity to utilise health care.

Maximin or Rawlsian View: This theory of social justice was developed from the egalitarian theory and it is attributed to John Rawls. It suggests a situation in which inequality can only be accepted as long as it is not possible to further improve the welfare of the worst-off (Peter, 2001). The principle advocates for the interest of the least advantaged individuals in the distribution of primary goods. The list of primary goods

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includes basic rights and liberties, income and wealth among other things but not health. This theory has been criticized for not operating with an explicit distribution. This is due to the fact that explaining the distribution of primary goods without consideration for such goods as simultaneously yielding utility is not adequate (Olsen, 1997).

In summary, a number of views of social justice have been developed in order to explain and consider distribution among individuals. Adopting the utilitarian view implies that no matter the level of need, those with greater capabilities can maximise their benefit as much as possible. It has been criticised for not taking account of distributive considerations for need. A maximising approach of the utilitarian's implies that we are indifferent between the health benefit of the poor and the rich (Peter, 2001). The libertarian view also promotes maximum benefit for those who can afford it. Thus all distribution of health care depends on the socio-economic conditions of each individual while the welfare of the poor is ignored. The maximin view is concerned with diminishing marginal utility (i.e. the poor should get higher satisfaction of any distribution in the society). However it has been criticized for not including health in the framework of explaining primary goods. Also as long as it is feasible to improve the status of the poor, resources will be directed to this group of individuals irrespective of the forgone improvements for the others. According to Arrow (1973) if this is to be adopted the rest of the society could be reduced to poverty.

What is particular about these views is that equity issues according to (Brody, 1998) are best considered as pluralist (i.e. one single theory may not adequately solve the problem of distribution within and between country contexts rather a pluralistic view is desirable.
The equity perspective taken in any country can be deduced from the health policy documents and the equity objectives that were specified. The egalitarian view is adopted for this study because of some of the shortcomings of the others. The reason is that, one, the utilitarian view does not consider need, but need is important if the welfare of the population especially the poor is to be considered. Secondly the libertarian view depends on ability to pay, so it neglects those with limited ability and with greater need of health care. Thirdly the maximin theory while advocating for improving the welfare of the

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worst-off does not consider that there is limited resources to cater for the needs of the poor. It has not given an explicit criterion to distribute health/health care resources, even though the poor has been specifically identified.

The egalitarian view is adopted because it gives preference to socio-economic allocation mechanisms that are required in health care. By promoting equal opportunity according to need implies that equal access to health care can be ensured (i.e. the supply of health care resources by the government is geared towards ensuring equal opportunity to all individuals and especially those with higher need). For South Africa, the health systems policy statement has given consideration to the needs of those with limited ability to pay as seen in section 1.5. The effects of allocation based solely on ability to pay has been moderated to ensure that those who cannot afford medical health insurance or the use of private health care can also get the desired health gain. This policy stance is closely related to the priority view discussed by Gwatkin (2000). The priority view purports that there is a link between health and poverty. Individuals who are of lower SES have been reported to have poorer health indicators such as low life expectancy, high infant mortality rates or higher incidence of burden of disease pattern. It would be necessary to ensure that this group of individuals have equitable access to health care resources in order to ensure equitable health care utilisation. What to consider then given the view that equal opportunity should be promoted is how this can be ensured. What quantity should each individual get, should all individuals be seen as similar or otherwise when distributing health care resources?

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3.1.2 Horizontal and Vertical Equity

Having differentiated between equality and equity, also the different views on equity as a result of its subjective nature, attention is now on how much should be distributed. The concern about distributive justice according to Mooney and Jan (1997) is how to examine the just distribution of healthcare among individuals. Within the health care policy, it would be necessary to determine if all individuals are treated equally or otherwise. This can be discussed within the principles of equity; i.e. horizontal or vertical equity.

According to Mooney, (1983) Horizontal equity is the equal treatment of equals i.e. by treating individuals who are alike in a similar manner. This implies that for instance in distributing public health resources, equivalent opportunity to utilise health care is made available to all individuals with similar need. However there are debates around what constitute 'equal treatment' and 'equals'. Vertical equity on the other hand, is the unequal, but equitable treatment of unequals i.e. by treating individuals who are different based on their needs. What is addressed here is how to ensure that those with different need are treated based on their respective needs in order that equity is achieved. This could be relevant when considering the needs of different socioeconomic groups; services for different care groups or in distinguishing between different disease patterns. Services for older people, people with mental health problems, disabled people, and underserved or underprivileged population groups are generally considered to be under-resourced when compared to individuals of lower need (Cullis and West, 1979). Thus the decision to choose either of the two principles will depend on the objective of policy in place.

Horizontal equity is more emphasised in health care because it is easier to allocate equal resources to all individuals based on their need for such treatment or distribution (Mooney and Jan, 1997). However, in practice differences in population groups (which is also the case for South Africa) usually have differing rather than equal needs, so vertical equity seems more appropriate. For instance in allocating resources to improve primary health care, efforts should be made to build more health facilities in underprivileged communities where those individuals who need the services more can utilise them.

According to Mooney (2000) addressing vertical equity in the delivery of health care will ensure that individuals of lower socio-economic status receive appropriately differentiated health care based on their need. This will ensure that poor individuals have greater access to health care. For instance, geographical or financial barriers do not hinder them from utilising health care. They are not affected by payment for care nor are they discouraged from seeking care due to distance to health care facilities. Vertical equity would appeal to targeted programmes for the poor, since it will ensure that those with differential ability to pay contribute in the proportion of their income or SES (Sen, 1973).

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The aim of the preferential treatment of the poor based on need, will be to reduce the disparities associated with socio economic conditions among differing population groups. For this study and considering the South African context, where there are huge disparities in SES among population groups, a vertical equity principle will be appropriate in assessing inequity. Vertical equity will ensure that those who are unalike are treated in dissimilar manner. The health system's equity policy has also declared exemptions on fees for specified individuals in order to give equal opportunity to all individuals. There would be need to then consider if fairness has been achieved in the utilisation of health care, for instance if those with higher need for health care utilise healthcare services the more.

3.1.3 Equity in Health Vs Equity in Health Care

Health is described as the physical and psychological state of an individual and not just the absence of diseases (WHO, 1976). Health care refers to all the major aspects of health services including utilisation, quality, financing and allocation of resources (Bravemam 2003). In line with this, health care is conceived as one of the determinants of health. To put this differently, health care is a derived demand i.e. it is consumed due to the need for health and not for health care per se (Grossman 1972). The reason for clarifying the distinction between health and health care when addressing equity according to Culyer (2001) is because the distribution of health care influences the distribution of health. The distribution of health care is important as it can serve as a foundation for the flourishing of individuals in the society. In every society or country and within the political or social system adopted, differences in health and health care have been noted between social/racial groups and geographical areas [Kohler and Martin, (1985), Whitehead (1992), McIntyre et al (1995)]. To address the issue of inequities in the distribution of health/health care among individuals, Culyer (2001) argued that what should dominate is the distribution of health. If equity in health distribution is the main goal, concern would then be on how health care distribution can reduce the differences in health given an equitable health care intervention.

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According to Whitehead (1992) health inequities are differences in health which are not only unnecessary and avoidable but which are unfair and unjust. For instance socio-economic characteristics, such as income, wealth, occupation, education or geographic location, may place individuals into different social groups. These characteristics are then associated with different levels of social advantage with respect to their health status. It has been established that socio-economic status (SES) interacts with both biological and physical characteristics of the environment (ibid). For instance, individuals with higher SES are more likely to work in favourable physical and social conditions, hence reflects differences both in social advantage and in the physical environment. Also it has been reported that at all ages; people with lower SES are more likely to die earlier or less likely to live longer, to suffer from specific diseases, or to experience illness or disability (Gulliford, 2003).

These differences in social advantage or disparities in health according to Whitehead (1992) can result from various dimensions. There are some that are classified as being unavoidable as such 'fair', with respect to a particular country and at a particular point in time. These are natural and biological variations or personal lifestyle of an individual based on choice, which are damaging. Therefore differences from these dimensions are termed fair and justifiable and would not normally be classified as inequities in health. For illustration, natural variations between one individual and another are inevitable in terms of age, gender or heredity. These natural variations are exhibited in the health status of individuals. However there are variations in health that are avoidable, thus termed as unjust. Differences in health that are considered as avoidable are those arising from social status and the environment. Such variations could arise from exposure to poor living or working conditions (poor water supply, unhygienic sanitation, barriers to transport), inadequate access to health care and other services. In addition, much of the differences between different ethnic groups or population groups in a society may be attributed as avoidable. For instance in a situation where lack of infrastructure subjects a particular population group to live in an unsafe and overcrowded housing, poor sanitation or experience of frequent loss of employment may be termed inequitable. This implies that, if higher rate of ill-health results from such socioeconomic variations, such

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differences among population groups would be termed inequitable. On the contrary, some situations based on personal or societal choices or lifestyle may change the sense of inequity. For instance, violence or injuries suffered frequently by an individual or a certain group (due to personal choices) may not be seen as inequity.

Another argument put forward by Culyer (2001) is that an equitable health care distribution would seek to reduce inequalities in health (life expectations, self reported morbidity, quality of life and social functioning). The question raised is whether by seeking equality of health one is not reducing the health of the already relatively healthy which may result in inequity. To make a distinction between equality in health and health equity is desirable to determine what is being measured. This had been mentioned earlier when differentiating between equality and equity. In other words equity in health is achievable in as much as the distribution of health among individuals is not a function of social classification or economic status. Equality in health outcomes may be unachievable given the natural or biological factors that are peculiar to each individual (Whitehead 1992; Oliver and Mossialos, 2004). However, equity in health care refers to the fairness in the distribution of all aspects of health care services both in the quality, financing and allocation of resources (Peter, 2001). Most of the literature on health care equity has shown that equity in health cannot be achieved without due consideration for an equitable health care system [(Whitehead, (1992); Braveman (2003); Culyer (2001); Mooney (1994)]. According to Culyer (1998) and Mooney (1983), if the goal of every health policy or system is to improve the health of all individuals, then an equitable health care distribution according to need should invariably ensure the improvement in the health of all individuals.

Mooney (1983) discussed seven different possible operational definitions of healthcare equity that can be adopted within any health care system. Equity in health care can be achieved either through the resources that are distributed or the outcomes of health care delivery. Six of the equity definitions are linked to the resources of a particular health care system. These include; equality of expenditure per capita; equality of input per capita; equality of input for equal need; equality of access for equal need; equality of

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utilisation for equal need and equality of marginal met need. Equality of health is the only definition that is outcome oriented and may be dependent on the other six goals mentioned earlier.

Equal expenditure per capita: This suggest that equity is achieved when per capita expenditure is the same for all regions in the country. In other words the resource allocated per head is the same based on the total resources available to all the regions of the country.

Equal input per capita: In a situation where all the resources (land, labour equipment) are distributed pro rata with the regional population. This implies that differential costs of production should be considered when allocating health care resources in the population.

Equality of input for equal need: This view argues that the distribution of health care resources within the population should be based on the differential need of the population. For instance within the outpatient departments, medicines and short stay beds should be allocated based on need. This will be explained later when discussing need for health care.

Equality of marginal met need: This is another view in explaining need. This assumes that if all health need in all regions were listed on scale of preference, as one need is met lower priority is given to such in all regions. Equity then will be achieved when each region with its available budget was able to meet the same marginal need.

Equal access for equal need: The concept equal access for equal need implies that all that is required of an effective health system is to make health services available and to give equal opportunity to all those in need of health care (Mooney, 1983). This can also be described as equal costs (material and time) to individuals thus distance travelled for health care should not constitute any barrier.

Equal utilisation for equal need: This states that, individuals who have equal need for health care should consume or use the same levels of health care irrespective of their

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preferences and taste for health care (Mooney, 1983). This equity goal is very important because it determines to a considerable extent, whether the resources that had been distributed to improve access are utilised by individuals and if they are equitable.

Equal health status: This view assumes that equity will be achieved when the health status of all individuals is the same in all regions.

For this study, focus is on equity in health care utilisation as a health care goal, given that equitable allocation of health care resources will enhance equitable health care utilisation. For the South African Health care System, efforts has been made to improve access to health care for all individuals in the country, it would be necessary to determine whether health care utilisation pattern is higher among those with higher need.

3.2 Need for Health Care

Most definitions of equity subscribe to the notion that health care resources should be distributed according to need. Any definition of need according to Culyer (1995) should have these characteristics:

(1) It is based on the value of the health care system as such should be easily interpreted from the objectives specified.

(2) The objectives should be empirically applied to horizontal or (and) vertical equity principles that are directed to service and person specific given the resources available.

Some definitions of need have been identified by Culyer and Wagstaff (1993). These are: need as initial health, need as capacity to benefit and need as capacity to benefit given resources available.

Need as initial health: Need is defined as the existence of illness or injury as identified by an individual, his family or health care provider (Aday and Andersen, 1981). In other words need is equated to ill-health; those who are more ill than others have a greater need. In fulfilling the horizontal/vertical dimension of equity, it is assumed that individuals with similar health statuses have the same need and those with dissimilar health statuses have different needs. The literature on equity in health has shown that the

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health of individuals is also associated with their SES. The SES of individuals has been used as a proxy for defining need in the literature [(oliver and Mossialos, 2004; Gulliford, 2003; Whitehead, 1992)]. There is a general consensus that those of lower SES carry a heavier burden of ill-health and are least likely to get good quality health care services. Need in this case is based on the extent to which information about the differences in SES within a particular country context can be used to improve the distribution of health care resources to favour those with heavier burden of illness than others.

Need as capacity to benefit: Here emphasis is on what individuals can benefit from the health care system in order to increase their health status. An individual will have need for health care if he/she can benefit. This draws a distinction between ill health and need for medical care in that an individual may need health care but not be ill (preventive care) or be ill but and health care unavailable (i.e. when health care is ineffective or unavailable). For instance, an individual may be ill but treatment unavailable in the case of cancer treatments in low resource areas. In other words, only those that can benefit from health care have a need for health care.

Need as capacity to benefit given resources available: According to Culyer (1995) and Oliver and Mossialos (2004), need is the individual's capacity to benefit from health care with the amount of resources available to exhaust an individual's capacity to benefit from health care. This definition entails not just the existence of a health problem but the possibility of a policy intervention that would improve health. Since individual's capacity to benefit from health care is subject to the existing structures within the supply side factors so use of health care services should favour all individuals.

What can be drawn from the definition of need is that, defining need as initial ill-health helps to determine the health status of the population from the individual or patient perspective. It represents the potential demand for health care within the population. The definition of need as capacity to benefit indicates what the health care system can offer to individuals within the population in terms of both preventive and curative services. It represents all the available resources and technology within the system that can restore,

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treat or improve the health of individuals. However information about ill-health or the capacity of individuals to benefit from the health care system is not sufficient in countries where there are differences in population or social groups in the population. It has been found that there are huge differences in the experience of illness which are due to the SES among disadvantaged groups within populations (Whitehead, 1992). The use of lower SES as an indicator of need is necessary in countries with huge unequal distribution of income such as South Africa. In South Africa, variations in the SES may influence the need for health care. Hence, for this study need is indicated by lower SES among ill/injured individuals.

3.3 Utilisation of Health Care

The concept of utilisation is used extensively in health care. Utilisation can be seen as the use of health care services by the target population as a result of need (District Health Information System, 2004). In practice utilisation of health care is often used as proxy for access to health care though they actually measure different outcomes (Mooney 1983; Oliver and Mossialos 2005). It is necessary to distinguish between access and utilisation.

3.3.1 Access Vs Utilisation

Access has been described as the opportunity to use health services given that some set of circumstances allow for the use of health services (Oliver and Mossialos 2005; Thiede et al. 2007; Mooney 1983). These circumstances may include the information about existing services or the broader health system organisation such as financing mechanisms. The opportunity or freedom to use health care services may then be described as the relative costs (material and time) that predispose individuals to use health care (Thiede, 2005). Thus distance travelled to health care services or money spent should not constitute any barrier. According to Aday and Andersen (1974), access is divided into potential access and realised access. By potential access implies the opportunity to enter the health system. Thiede et al. 2007 summarises this as availability, affordability and acceptability of health care services.

On the other hand utilisation can be seen as realised access. This refers to the relationship between service availability and individuals who present themselves for service, i.e. it

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comprises both supply and demand of health care. In determining the availability, affordability and acceptability of services, it will require that individuals actually present themselves for use of health care. According to Slack et al. (2002), measurement of access remains deficient in health care. This is because information on access is not readily available. Theide et al. (2007) also mentioned that it is only when adequate information on health, health care responses and opportunities to use health services is effectively reported that equitable access of health services can be established. In practice much attention is paid to utilisation of health care services as a proxy to measure access. This is because it might not be possible to determine the potential opportunity that would be available to individuals if they have not actually used health care. In order words we would only be reporting what individuals would expect from health care services without an objective stance on what is in practice.

Utilisation exists when access to health care leads to the use of health care services by individuals in need. The opportunity to secure health care given the availability of services and the tastes/preferences of the individual is a determinant of health care use. If we assume taste and preferences for health and health care were the same, then equal access for equal need should be the same as equal utilisation for equal need. However individuals differ with respect to their health seeking behaviour in terms of characteristics peculiar to him/her. It would be erroneous to equate equal access to equal utilisation.

Utilisation of health care depends on supply (access to health care) and demand (i.e. the characteristics of individuals which reflect in their tastes and perception of the benefits of care). This determines how much is consumed or demanded given the utility forgone in terms of (financial and time) costs. The definition of demand as the quantity of services an individual is willing and able to consume at a particular time is generally accepted. However, the influence of supply on the consumption decisions of health care as a commodity makes it difficult to specify a pure demand function in empirical studies (McGuire et al. 1992). It may then be difficult to define demand in terms of consumption alone since concerns around agency relationships and supplier-induced demand influences health care utilisation. The demand for health care function may explain

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utilisation if it puts into consideration the demand and supply side factors. The demand factors include individual tastes and preferences that could determine willingness or ability to pay based on differences in SES among individuals. The supply side factors which can be equated to access also depends on the demand (i.e. demand does not exist independently of supply). Hence utilisation appears as a more relevant concept that acknowledges the consumption and choice of health care that the consumer or individual would utilise than demand. This being in consideration of the information the individual is in possession of and the treatment provided by the supplier or the health care system.

Utilisation based on consumption levels with respect to demand as defined by McGuire et al. (1992) is an episode of medical services received by an individual from a health care system. An episode can be a unit of medical service use or a combination of health services which form the whole set of services for a particular treatment of an illness or injury. Stoddart and Barer (1981) suggested that any policy initiative aimed at changing individual behaviour about health care consumption or utilisation would require information about episode(s) of medical treatment. It is also important to note that the definition of utilisation in terms of consumption of health care rather than demand is useful not only in acknowledging the influence of the supply or access to health care but also with regards to the role of health insurance. Since the uncertainty that is associated with the timing and the form of medical care episodes has influence on the demand for health insurance. In order to determine the utilisation pattern of healthcare within a particular country setting, it would be important to consider both the access factors and the individual characteristics given the equity objectives of the health care system. A review of the theoretical literature on utilisation would help to identify factors that could influence health care utilisation. This will be discussed in the next section below.

3.4 Theoretical Literature on Utilisation

The literature concerning utilisation of health care services are considerable. A wide range of frameworks for explaining and analysing health service utilisation can be found in the literature. The various determinants of health care utilisation that have been

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identified in the literature will be explained in the next section. This will help to determine the appropriate model and variables that will be used later in this study.

3.4.1 Andersen and Newman's Conceptual Model (1973)

Andersen and Newman (1973) developed a comprehensive explanatory model in assessing the adequacy of the health system in delivering an equitable access to and utilisation of health care system based on need. The framework outlined three main features of health services utilisation. These are the characteristics of the health services, changes in technology and societal norms/individual determinants of utilisation. It suggested that the framework for analysing health service utilisation should include both societal and individual determinants since less attention has been on the former. It also showed a close association between societal and individual determinants as one impacts on the other. However information about societal determinants such as technology and norms are not readily available from surveys. As such emphasises would be on individual determinants as it affects health service utilisation. The individual determinant of health service utilisation was fashioned on a behavioural model. It assumes that a sequence of conditions would contribute to the type and volume of heath service an individual uses. Health service utilisation of an individual could then depend on three main factors: These include, predisposing factors, enabling factors and need factors. This is further illustrated in Figure 1.

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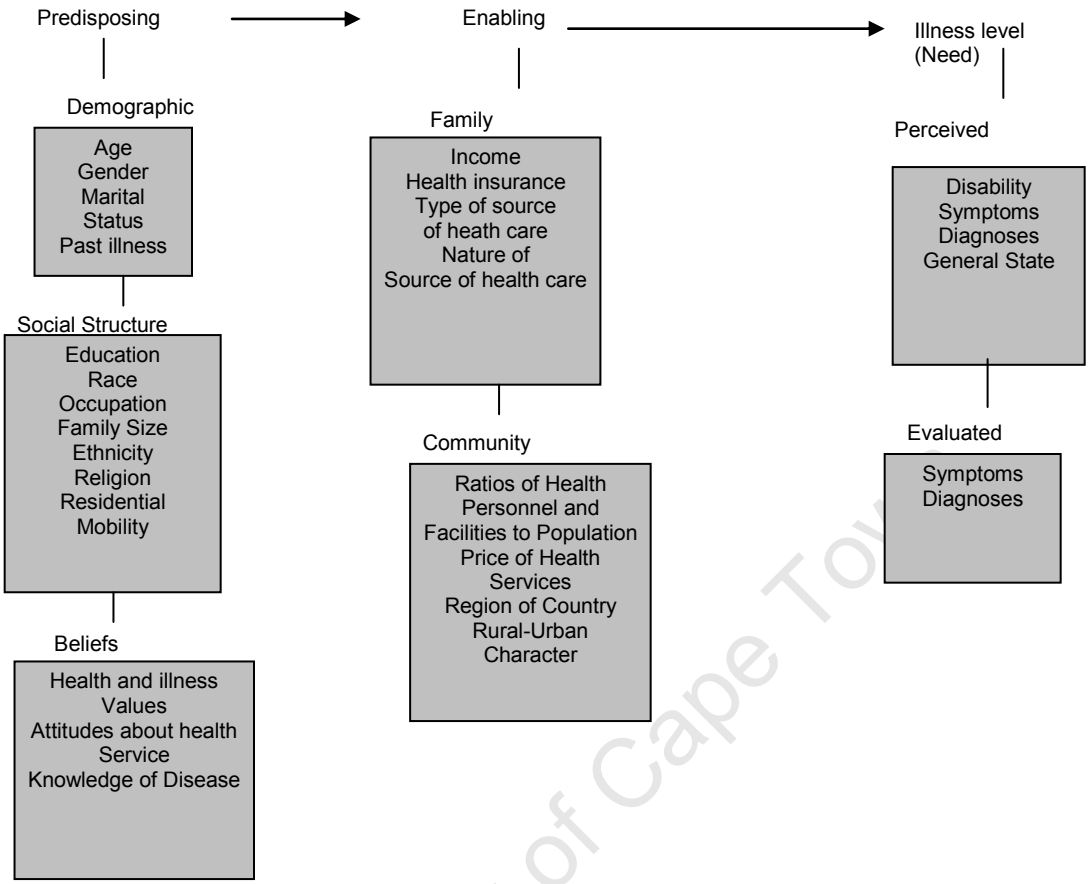
Figure 1. Individual Determinants of Health Service Utilisation



Source: Andersen and Newman (1973

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Predisposing factors: This refers to the individual's predisposition to use health care services. It implies that individuals have differential use of health care i.e. some individuals have propensity to use health care more than others. In this sense propensity to use health care can be predicted by characteristics peculiar to him/her. This differential use can be predicted prior to the onset of a specific episode(s) of illness. The range of characteristics possessed by an individual at a particular time will influence his/her pattern of health service utilisation. Such factors could include demographic characteristics, social structure or beliefs. Demographic variables are age, sex, marital status and past illness. Social structure variables consist of education, race, occupation, family size, ethnicity, religion and residential location. Belief variables mentioned are values concerning health and illness, attitudes towards health services and knowledge about illness.

Age and gender are both biological factors that suggest the likelihood that an individual will seek health care. They are both closely related to health and illness. For instance individuals in different age group will have different severity or type of illness as such differences in the pattern of health care utilisation. Also the type of health care services that will be utilised among females will differ from males. For example females are more likely to utilise antennal and primary health care more than males due to differences in their biological need.

Education, race, occupation, family size, ethnicity, religion and residential location are classified among the social structure variables. They determine an individual's status in the community. The model also suggests that the life style of an individual, behavioural patterns as well as the social environment can influence health care utilisation. Education, occupation and family size can determine the economic status of an individual. Race and residential location is closely related to social status of an individual and can also determine his state of health. For instance those in the rural areas are more likely to be farther away from health care facilities. The distance to a health facility may then impact on their pattern of health care utilisation.

Health beliefs are attitudes, values and knowledge that people have about health and health services can influence perceptions of need and actual utilisation of health care services. This variable is closely related to demographic and social structure variables. The biological and socio-economic variations among individuals determine their general perceptions of need and health care utilisation. For instance, different population groups or race groups may occupy varying social positions in the community. Consequently, the type of health care provider that will be used will vary depending on their belief about health care.

Enabling factors include family resources such as income, health insurance coverage, or other sources of third-party payments. These are factors that enable or facilitate the actual use of available health care services. It can also be termed as some of the access variables

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as identified by Penchansky and Thomas model (1981) which describe the spatial distribution of health care along geographic, socio-cultural and economic factors. For instance individuals who are from a wealthy family would be able to afford health insurance coverage. They would be more likely to utilise health care compared to individuals from a poor family. Availability of third-party may be in form of medical insurance coverage, household income or free health care services. Free health care services could eliminate or reduce financial and time costs barrier on the part of the individual hence it could influence behaviour on health service use.

Illness level or Need factor: Given the assumption that predisposing and enabling factors are present, the individual or family who perceives illness presents at the health care service in order for utilisation to take place. These could be in form of perceived health state, disability, symptoms or actual diagnosis.

The model explored both individual and societal determinants of utilisation in its framework. It helped to identify some of the barriers to the use of services, hence providing a basis for the assessment of equitable health care utilisation. However the model has been criticized for its poor predictive power to explain how each of these variables affects health care utilisation among individuals (Andersen, 1995). According to Rundal (1981) there are still questions around whether the model was meant to predict or explain use of health care. Nevertheless it has given an explanatory process or causal ordering of the sequence of conditions that may influence health care utilisation.

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3.4.2 Health Belief Model

The Health Belief Model (HBM) is a psychological model that attempts to explain health behaviour by focusing on the attitudes and beliefs of individuals. A wide range of the applications of the model was done by Becker (1974). It has been applied in the area of Tuberculosis screening to other areas such as immunisation, people's different responses to public health measures and use of health services. The model takes into account the households reaction to symptoms of specific illness. In addition it explains other behavioural elements such as risk exposure to certain activities, perception, and knowledge about health problems and decision of households' members about the type of

services needed. It was first developed in the United States of America (USA) to explain the lack of public participation in the prevention programmes of the USA public health service. It was developed specifically for exploring short and long term health behaviour in Tuberculosis and has also been used in sexual risk behaviours and treatment of HIV/AIDS.

The model assumes that individuals fear diseases and that health actions are associated with the degree of fear and the expected potentials of actions. This implies that individual characteristics to decide whether to seek health care would outweigh the net benefits. It therefore classified individual attitudes and behaviours in seeking treatment into the following:

Perceived susceptibility: This refers to one's opinion of the chances of being infected by an illness or health condition. This explains that there are differences in individual responses to public health measures or policy and the use of health services. For instance an individual can have a disease or health problem and may not be able to identify it. This can be due to lack of information or the attitude to ill health. This has also been associated with severity of diseases which can affect the clinical and medical organisation within the system and societal consequences as well.

Perceived Benefits: This refers to the belief about the strategies and services available in the health care system. The perception of an individual about the quality of health care services may have influence on use of health care services. This will either help individuals to treat their illness or to reduce the burden of diseases.

Cues of action: This refers to the physical symptoms of a health condition and the environmental factors that make people to take action in seeking health care. This has been promoted among individuals by giving awareness about health and health care problems.

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Perceived barriers: This refers to the possible health care problems that may arise from taking or seeking health care. This may be in terms of physical, psychological and financial demands. This is linked to access factors that may influence the use of services.

The model has helped to explain the factors predisposing an individual to a particular health seeking behaviour. It has explained how information can influence the use of health care services given peoples belief and knowledge about symptoms of illness. It has also identified that access is important in health care use. However it has not been able to fully explain factors enabling and reinforcing one's behaviour; and these factors are becoming increasingly important in explaining and predicting more complex lifestyle behaviour (Harrison et. al 1992). For instance enabling and reinforcing factors was explained in the Andersen and Newman's Model in section 2.4.1 above.

3.4.3 Grossman's Demand for Health Model

Grossman (1972) provides a formal model that analyses the demand for the commodity "health". Fundamentally, demand for health care by the consumer is for health and not for health care per se. Thus the demand for health care is a 'derived demand'. An approach to consumer behaviour is associated with the inherent qualities that enhance the basic decision making of an individual to consume commodities (i.e. the tastes and preferences of individuals influences their choice of consuming a commodity from a given bundle of goods). He applied the approach to consumer behaviour to health given that analysis of the demand for health and health care follows an initial analysis of a normal commodity. Consumers demand health for two reasons; as a consumption commodity (thus health is directly associated with their utility function) and as an investment commodity (for example, it determines the amount of time available for work). In allotting time to different activities such as work, leisure or consumption of other commodities, investment in health is desired. The investment model has gained greater emphasis in the demand for health and health care in the Grossman model and thus will be the focus for this study.

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His investment model proposed that health could be regarded as a durable capital stock that produces healthy time as output. He assumed that individuals inherit an initial stock of health that diminishes with age and can also increase with the investment on health and invariably health care. His framework indicated that like other goods, demand for health is not dependent on the shadow price alone. He illustrated that the investment on health and invariably health care is subject to factors such as age, changes in wages or income and the level of education, which are constraint by time.

He explained that the relationship between age and the demand for health is positive, assuming that depreciation in health increases with age for each individual. As depreciation rate increases the marginal cost of producing healthy days also increases hence there is an increase in the shadow price of health. Therefore the demand for health care, being one of the inputs in the health investment function will increase as the price of health capital decreases. This will depend on the elasticity of the demand for health capital. Thus those who are less healthy are more likely to consume health care. In considering the impact of wage, as wage increases, the monetary value of health stock also increases. Putting differently, the higher an individual's wage, the higher will be the value placed on his health and time devoted to healthy activities. Lastly the effect of education on the demand for health assumes that education increases the demand for health. This implies that the information received from education could increase the investment in the household production due to taste.

The predictions of Grossman on the possible factors that could influence demand for health are that increases in age, wage rate and education are associated with increased demand for health. However his model was criticised for not considering uncertainty associated with health. He assumed that the depreciation rate with ageing is potentially known, thus an individual has control and can choose his own life cycle. It failed to acknowledge the effect of accidents or illness, which may impact hugely on the rate of depreciation of the health capital. Usher (1975) points out the role of health insurance in demand for health care. The demand for health insurance cannot be totally separated from the demand for health care. Also the assumption that the consumer has perfect

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information is not always true due to supplier induced demand. Muurinen (1982) also identified that the model did not consider impact of household decision making on the demand for health care since elderly people and children do not have independent decision to seek health care.

The theoretical literature has helped to identify various determinants of health care utilisation, as it influences the health care seeking behaviour of individuals. The Andersen and Newman's conceptual model (1973) has not been able to fully explain each of the variables as it affects health care utilisation. However it has given insight into the range of variables to consider when assessing equitable health care utilisation. The demand for health model by Grossman (1972) was able to identify only three variables but it has given some insight into how to describe each of the variables. In all it will not be adequate to determine the factors that affect health care utilisation just with one model. All the different factors as identified by other models (though may not have given adequate description about the variables) but will help to explain health care utilisation more extensively. All the models will serve as a basis for choosing our variables for this study. Also the empirical literature will further help to explain how researchers have investigated or tried to explain the factors that influence health care utilisation. This will be illustrated in the empirical literature in the next section.

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3.5 Measurement of Equity in Health Care Utilisation

Measuring equity in health care utilisation has often used the need criterion to determine the behaviour of individuals when utilising health care (Gulliford, 2001; Aday and Andersen, 1981; Mooney, 2000). This helps to determine the interaction between the health system and the choices available to users of health care. Kunst (1997), Gulliford (2003), and Abasolo et al (2001) summarised some of the basic approaches to assessing health care inequities with respect to health care utilisation. Based on their review, three main approaches were identified. These can be by simple comparison of rates of utilisation for different social group or individuals, use of regression methods or by developing Gini-like coefficients/concentration curves or indices. The use of simple comparison of rates requires absolute or relative measure to compare different selected social groups. The selected social groups are classified according to percentiles of their

distribution of income. In absolute terms, the defined percentiles based on income are compared with health state or need for health care. In relative terms, the selected social groups that are classified according to percentiles of income distribution are compared with the size of the total population. The relative comparison rates will help to determine the social groups that are in the higher income category when compared to the maximum or minimum income levels.

The Lorenz curve describes the distribution of a given phenomenon for instance income, utilisation or benefits in the population. It is a graphical summary of the relative index of inequality. The Gini-like coefficient is a mathematical summary of the Lorenz curve thus also provides a measure of inequality. It can also be used to summarise the estimated inequality in the distribution of health care access and utilisation. Both have been criticized for not being able to take account of broader socio-economic dimension to health care inequities. Van Doorslaer et al (1993), estimated measurement of inequity based on the Gini-coefficient by using the concentration index and curve. This approach uses the cumulative proportion of the population, ranked by income, then plotted on the horizontal axis. The cumulative proportion of either health care utilisation or need is plotted on the vertical axis. The concentration curve therefore describes the distribution of income-related inequalities in utilisation or access. The diagonal line represents a situation of equal distribution of health care utilisation or need (Figure 2.).When the poor have a lower share of health care utilisation than the rich, the curve will lie below the diagonal, but when there is a greater share of utilisation to the poor, the curve will lie above the diagonal. A positive value in the cumulative proportion of health care utilisation to population ranked by income indicates disproportionate concentration of utilisation favouring the rich, and a negative value indicates disproportionate concentration favouring the poor.

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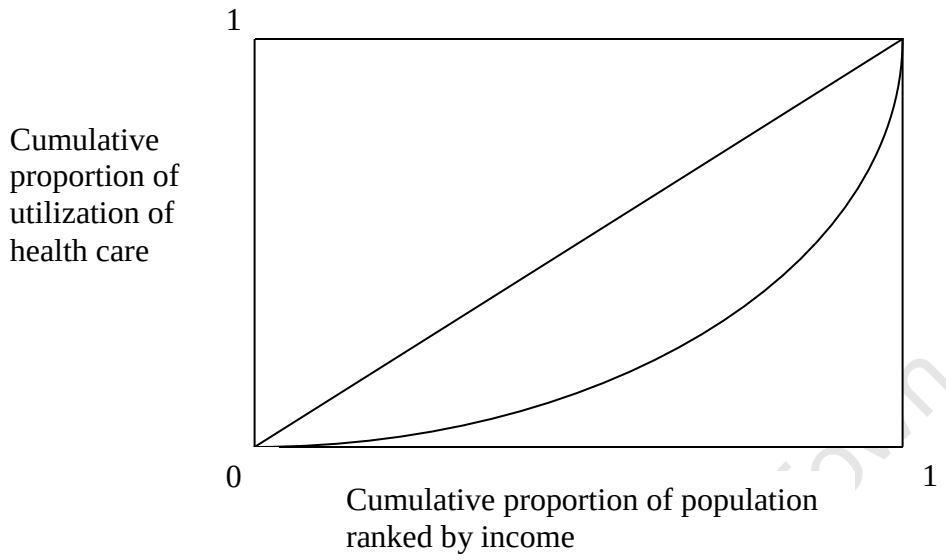
Figure 2: Inequalities in the distribution of health care utilisation



Source: Gulliford (2003)

This approach has been used more in evaluating horizontal equity in health care utilisation (Van Doorslaer et al. 2000; Onwujekwe 2005). Nevertheless Abasolo et al (2001) showed in his review that this approach of standardisation is not sufficient for assessing vertical equity. This is because it does not help to explain the origin of any deviation from horizontally equitable distribution of health care services. In order to understand any potential inequity, the econometric approach through regression analysis seems to be a more informative tool.

The regression methods offer an alternative method for comparing groups of interest in the population or sample through the estimation of regression coefficients and odds. This can be used to produce an overall summary measure of inequity in access and utilisation. It requires an assumption that the selected measure of socio-economic status represents an interval scale. It employs the specification of a model that defines the dependent variable on various explanatory variables. The regression coefficients for the explanatory variables provide a measure of the mean difference in the dependent variable after

adjusting for the independent variable. However it may be necessary to use more than one method in order to explore different dimensions to explaining the relationships in consideration or to increase the predictability of the parameters that are being explained (Gulliford, 2003).

3.6 Empirical Literature

Health care utilisation studies have received a lot of attention in health care research. There has been substantial research on health care utilisation in developing countries including South Africa (Kimbell, 2006). Approaches to studying health care utilisation have taken different dimensions depending on the identified problem of the health care system in a particular country context. While some have been directed at reviewing the efficiency within the health system (Pronyk *et al*. 2001, Ngamvithayapong *et al*. 2001, Myburgh *et al*. 2005), others are geared towards assessing the equity measures in the system (Wadee *et al*. 2003, McIntyre *et al*. 2006, Kimbell, 2006). Both approaches have shown to be of importance in monitoring and evaluating the health care system. An overview of the existing empirical studies on health care utilisation will guide this study in the identification of factors influencing utilisation patterns. Also, it will help to determine the type of model to be used for analysis and the possible influence of these factors on utilisation.

3.6.1 Overview of International Experiences

Yip *et al.* (1998) assessed the factors that influence patient choice of health care provider in a three-tier health care system in rural China: village health posts, township health centres and country hospitals. Analysis was done using a multinomial logit regression model to compare the use of different health care providers on variables that could influence individual choices. The variables considered to determine the demand for health care were, ownership of medical insurance, income, quality of care, severity of illness, age, education, gender and health status. The findings showed that ownership of medical aid, higher levels of education and income had a positive impact on utilisation of health care and the type of provider used. Individuals of higher income are more likely to use country level hospitals than individuals in lower income class but coefficients for gender, marital status and occupation were insignificant.

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Chappell and Blandford (1987) and Bos and Bos (2004) both analysed utilisation patterns among the elderly. The former analysed utilisation of homecare, physicians and hospital services in Canada. Utilisation of home based care is examined in terms of the number of home based care currently received and total number of hours received per month. The independent variables were categorised as predisposing, enabling and need factors based on the Andersen and Newman's model. The variables include gender, age, marital status, education, occupation, ethnicity or population groups, income, social support and networks. Medical insurance was excluded from the variables because all the individuals are covered through provincial health insurance. Need was measured through perceived health and number of sick days and hospital visits or admissions. The findings from both home based care and hospital and physician services revealed that, those who are single, separated or divorced, those with fewer relatives and lower income earners are more likely to use these services i.e. they tend to be in need of social support. Need emerged as a significant predictor for hospital and physician services but was not the case for home based care. The reason for this is that the type of diseases or illness will determine the use of hospitals and physician services.

Bos and Bos (2004) assessed patterns of utilisation between private and public health care providers in Brazil. They considered variables such as socio-economic, demographic and epidemiological conditions. The study assessed the impact of age, gender, education, individual income and health status in the utilisation of private or public health providers by the elderly. The results indicated that increases in age, income, and educational levels; and being female are positively associated with the choice of seeking health care from private providers. The study is limited to a specific age group, so this might affect its generalisabilty to the entire population.

Within Sub Saharan Africa, health care utilisation studies could also be sighted in Kenya, Zambia and Nigeria. Ikamari (2004) assessed the utilisation of maternal health care in Kenya. The objective of the study was to identify the main service providers and existing barriers to health care utilisation among women of reproductive age. It used three

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household surveys; health facility survey and two reproductive health surveys. The variables used are age, education, marital status and location of residence, type of service provider used, geographical area, cost of health care, quality of care, travel cost and belief about services. Analysis was descriptive, using simple percentages and cross tabulation as a major tool for data analysis. The results indicated that most respondents were aware of health care provision but majority sought care late in their pregnancy. The determinants of maternal health care utilisation identified were: distance; as majority of births were at home. Lack of access in terms of poverty and high user charges hindered utilisation. Poor quality of care and geographical location also had declining influence on utilisation. Access to health care facility is not available to most of the respondents which resulted in low utilisation rates, when comparing the location of the respondents.

In Zambia, Stekelenburga and others (2005) investigated the determinants of health seeking behaviour to determine the factors that influence the choice of health care provider, by employing both qualitative and quantitative methods. The objective of the study was to determine why utilisation of hospital services was low in the area. The dependent variable used was the type of service provider (either hospitals or traditional healers). The independent variables used were education, age, gender, waiting time, satisfaction and cost of care. They reported that preference for traditional healers was higher with 88% of respondents reporting that they would visit traditional healers in future when ill. Among those who had utilised any of the available facilities, women are also reported to visit more of traditional healers than men. Level of education was not an important determinant of utilisation. There was no significant difference in reported use of traditional healers among different education levels. Though, individuals of higher education visited traditional healers less frequently or not at all for some specific diseases. Older members of the population are associated with more frequent visits to both hospital and traditional healers. Frequency and severity of diseases in older people had influence on higher health care utilisation. The quality of care in terms of waiting time is shorter in traditional healers than in hospital care, though respondents reported higher satisfaction of care in the hospital than in traditional healer facilities. This study also explains the reasons for differences in the type of service provider used. However the

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study did not use any model to determine the significant power of the data (as it only used frequencies and means).

In Nigeria, Onwujekwe (2005) investigated the socio-economic inequities in seeking health care for the treatment of communicable endemic diseases and the determinants of the use of primary health care (PHC) centres in the rural areas of the country. It employed a cross sectional quantitative method to determine health care utilisation for 6 most important health care problems in Nigeria. These are HIV/AIDS, Tuberculosis, Malaria, Upper tract respiratory diseases, diarrhoea, and onchocerciasis. Individuals with these specific diseases were interviewed about their health seeking patterns. The dependent variable i.e. utilisation of health care was classified into low level health care providers such as patent drug dealers or traditional healers and high/medium level providers which include PHC. The independent variables used in the analysis were age, marital status, education, and household status, number of household members, household wealth and type of illness suffered. Access variables such as distance, financial costs, and perceived quality of care were also included as independent variables. A socio-economic status (SES) index was generated from the household's assets data, using Principal Component Analysis. These indices were the basis for grouping households into quartiles. A logistic regression analysis was used to determine the relationship between health care utilisation and the independent variables. In order to test for equity in the utilisation of PHC centres, the SES index as part of the independent variables should be positive and positively related to the dependent variable if there is inequity in health care utilisation. Other variables assessed for inequities were type of provider used, number of days of illness and whether patient who did not seek care was outside home. The results revealed that the poorest quartile were more likely to use low level providers and least likely to use PHC centres. SES, availability of good services, shorter distance to facilities and quality of care are positively associated with the use of PHC centres and were all found to be significant. However demographic variables such as age, sex, marital status and individual status in the household were found to be insignificant.

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There are also studies specifically addressing equity in the health care system as it impacts on pattern of utilisation. Abasolo (2001) assessed whether utilisation or access to public sector GPs in Spain was consistent with the twin criteria of horizontal and vertical equity where these were defined with respect to need. Utilisation of publicly funded Spanish GPs was defined as a function of access and need. The study used both the logit and probit regression model to assess the effect of the independent variables in the utilisation equation. The independent variables used were age, gender, socioeconomic background, (as measured by education, occupation region of residence, household status and ownership of private health insurance), waiting time, travel time and costs. The study specified the hypothesis that horizontal equity in access and utilisation would be achieved if differential utilisation of and access to health care among individuals relate only to differences in their need. Need was measured based on general health state which was indicated by ill health. Vertical equity would be achieved if differential utilisation of and access to health care is greater among individuals with greater need. In order to assess the differential utilisation and access to health care other factors such as age, socio-economic status, geographical region and travel and waiting time were included in the model. The results are consistent with vertical equity as those with poorer health status have a significant and positive relationship with GP utilisation. Also the coefficients on educational attainment and socio-economic group are positive. This implies that those in the lowest education category are more likely to use GPs compared to those with higher education level or socio-economic group. However, the results were not consistent with horizontal equity because differential access or utilisation did not relate to need alone i.e. the health status of individuals. It showed that those in the lower socio-economic group and those with lower education are more likely to visit their GPs compared to those with higher status. The reason suggested for the horizontal inequity in GP utilisation after controlling for need is that lower SES may account for unobserved need. That is, those with lower SES may have reported lower health statuses. It was also suggested that a higher degree of substitution between the private and public sector services among higher socio-economic groups who have private medical insurance may not have been fully captured. This implies that private medical insurance ownership has impact on the use of public GP because individuals with higher SES would have a choice of choosing between

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health care providers available. There were also variations in the utilisation between regions. Age did not have any significant impact on utilisation for both males and females. It was also found that both genders are less likely to use public sector if they have private health insurance. In controlling for access, it was found that travel time did not have any effect on utilisation for both genders.

3.6.2 South Africa's Experiences

Makinen and colleagues (2000) assessed inequality in the distribution of health service use and health expenditures in eight developing countries and countries in transition: Burkina Faso, Guatemala, Kazakhstan, Kyrgyzstan, Paraguay, South Africa, Thailand and Zambia. The analysis used national household survey data to examine the distribution of service use and expenditures in the respective countries. Country populations were divided into income quintiles. It was found that richer groups are found to have a higher probability of obtaining care when ill, more likely to be seen by doctors and receive medicines compared to the poorer groups.

In the case of South Africa, analysis of the 1995 October Household Survey (OHS) data indicated that there is a clear trend that wealthier individuals are more likely to seek health care in the private hospitals. It was also indicated that pattern of household spending on health care for the lowest four quintiles in South Africa is four times lower than what is spent by the highest income quintile. The highest income quintile is concentrated with the minority white population. This population group could afford private insurance cover that is beyond the means available to the other 80% of the population. It was concluded from the study that it will be worthwhile to measure inequity to inform policy making based on the impact of policy changes in South Africa (ibid).

Wadee et al. (2003) and McIntyre et al. (2006) also assessed the inequity in the trends of health care utilisation in South Africa. They both did their analyses using the October Household Survey for 1995 and 1999. They used multinomial logit model to examine the differences in utilisation pattern and the type of health care sought. The independent

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variables used were age, gender, race, household income, location, medical aid and level of education. It was found that pattern of health care utilisation is split on racial grounds. The results of both studies are consistent with the study by Makinen and colleagues (2000). Both concluded that larger proportion of high-income White population use private health sector compared to the lower proportion of high-income Black majority population group using private facilities. Nevertheless use of private sector facilities has increased among all population groups. Wadee and others (2003) further explained that these might be as a result of growth in the private provision, and the perceived or experienced reports that there is decline in the quality of public facilities.

3.7 Summary from the Literature

The literature review has given some insights into the key concepts, methods and approaches to studying health care utilisation patterns. Equity as a concept has been conceived as a means of ascertaining fairness or justice in the distribution of health and health care. It is clear that equality in distribution may not necessarily mean equity. Both concepts are used interchangeably but equity can only be achieved when consideration is given to the similarities or differences among beneficiaries of health care when distributing health care resources.

A number of views had been held on how best to ensure that individuals benefit from health care as much as possible to improve their health state. The most important difference among these views is that some are based on the consideration for need while others are not. The egalitarian view promotes equality of opportunity based on need. This is the view held for this study since opportunity to access health care can help to determine equity in health care utilisation. The questions raised then were that; what quantity should each individual get? Should individuals be treated equally or otherwise?

The principles of equity were used to answer these questions. Given that any equity principle either horizontal or vertical should fulfil the criterion of fairness, the vertical equity principle has been chosen for this study. Vertical equity is appropriate because there are variations in SES in South Africa which may determine differences in need for

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health care among individuals. In addition, vertical equity can ensure that health care utilisation among the underprivileged is higher based on their higher need for health care.

The equity principle adopted has also helped to explain the issues around need for health care. Need for health care can be regarded as ill-health, capacity to benefit and capacity to benefit based on available resources. They have all been found to be important in assessing the need of the population. Need as initial ill-health explains the health state of an individual. This is often reported with self reported health status. Capacity to benefit on the other hand considers the health state of the individual but putting in mind the capacity of the health care system to treat the individual in need. Information about capacity to benefit will entail information about the availability of services within the health care system.

In practice lower SES has been used as an indicator of need especially in countries with huge unequal distribution of income such as South Africa. In South African, variations in SES may influence the need for health care. Hence in this study need is indicated by lower SES among ill/injured individuals.

The debate on equity in health vs. equity in health care has also been clarified. It is evident that equity in health care is achievable within policy framework. Equality in health is difficult to achieve due to biological factors that are beyond the control of allocation and distribution of resources. In all, equity for this study is defined as the identical but proportionate distribution of health care resources based on need.

The distinction between access and utilisation was also discussed. Access is the opportunity to use health care services. It entails the availability, affordability and acceptability of health care services. It comprises of all the resources necessary to make consumption of health care possible. However it is not supply of health care resources alone that leads to utilisation. Utilisation occurs when the opportunity to use health care actually leads to the consumption of health care services by individuals. The equilibrium point at which the predisposing factors that determines access and the individual

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willingness and ability to use health care meet represents the utilisation of health care. Utilisation would then be seen as the episode of medical care received from the health care system. In practice information about utilisation has been reported to be more adequate and available while information on access is not effectively reported. Utilisation stands as a better basis in which the pattern of health seeking behaviour among individuals can be measured.

The literature review has also facilitated the identification of determinants of health care utilisation. It has explained relevant factors that could influence health care utilisation. The Andersen and Newman's Model (1973) has established a comprehensive framework for assessing individual determinants of health care utilisation. It has identified both the demand and supply side factors influencing utilisation unlike the Grossman model, which only concentrates on demand side factors. The empirical literature has also helped to determine the variables that would be relevant given South African context. In addition, it has helped to determine the method(s) that will be used for the analysis of the available data for the study. Analysis using both descriptive statistics (i.e. simple percentages and cross tabulations) and econometric approach through regression has been found to be useful in assessing utilisation while taking account of all the relevant variables. These are the tools chosen for the analysis of this study.

The clarification of concepts, methods and approaches to studying health care utilisation from the literature review has helped to better understand the framework of this study. This will form the basis in which the conceptual framework will be designed. This will be discussed in the next chapter.

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Chapter Four: Conceptual Framework

4.1 Introduction

The aim of this chapter is to develop a framework that will help to identify factors influencing variations in health care utilisation among individuals based on need for health care. This is based on the theoretical review of health care utilisation specifically the Andersen and Newman's conceptual model (1973) including those identified from the empirical literature. Four dimensions have been chosen to explain the factors influencing health care utilisation. These are the individual dimension which defines the demographic and socio-economic characteristics of individuals as well as household status. The access dimension suggests factors relating to the availability and affordability of health care services which are classified as geographic and financial in nature. Health care system describes factors relating to the organisation of the health care system while the health policy dimension identifies the equity objectives of the health care system. Figure 3 illustrates key influences on health care utilisation based on the theoretical review. This is will be the framework for this study.

4.2 Factors influencing Health Care Utilisation

Both theoretical and empirical studies have given insights into the variables that should be used in any health care utilisation study. These are shown in Figure 3, though they might vary from one country to another depending on the data available. For this study variables have been categorised into four groups or dimensions for better understanding of the factors influencing health care utilisation:

1). Variables that describe individual characteristics. This is divided into individual determinants and household status.

Individual determinants include demographics, socio-economic and belief and perceptions. Variables that identify an individual are demographic; age, gender, marital status and race/population group. Those that enable individual to secure health care are socio-economic; income, medical insurance, level of education and

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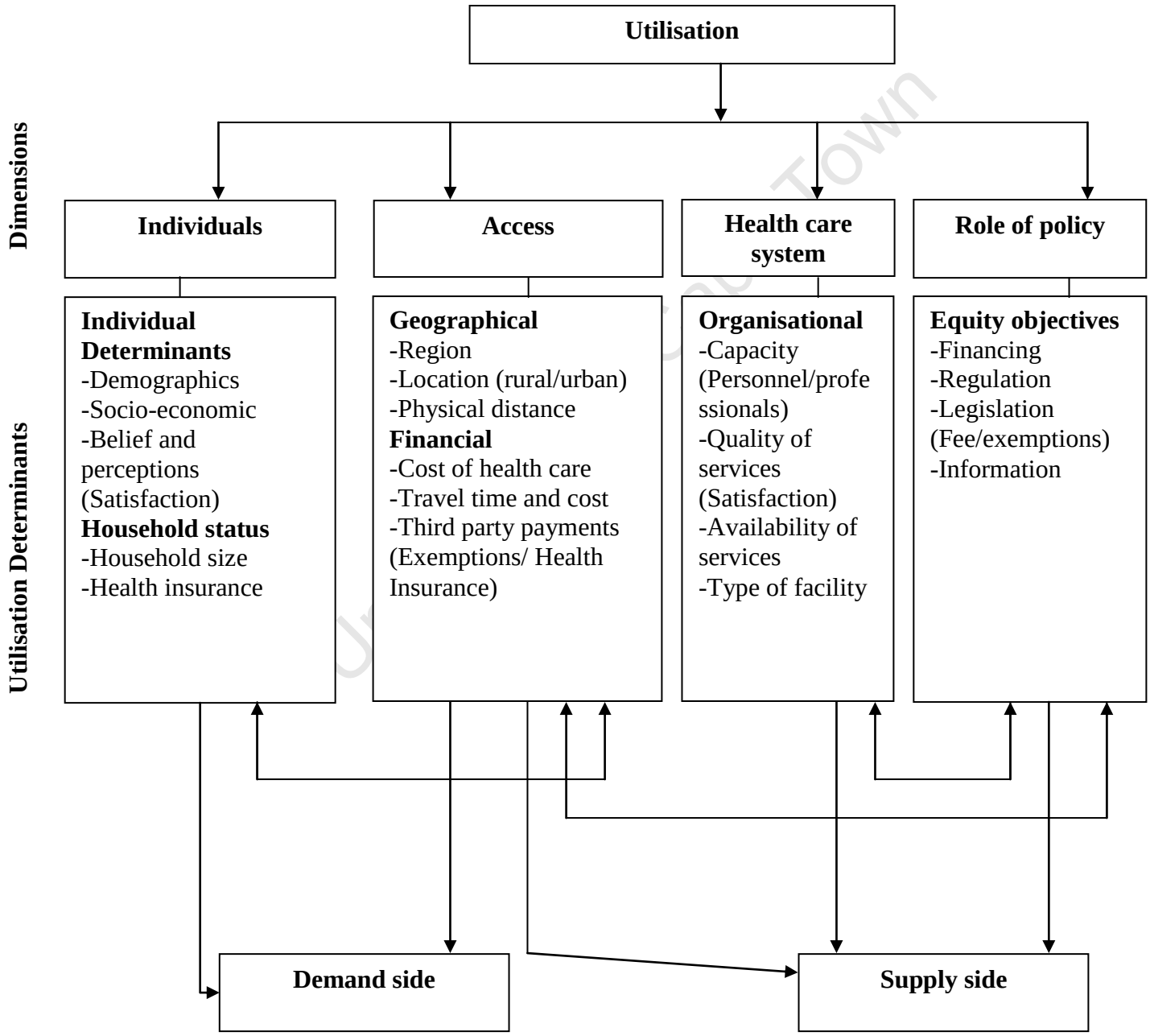
household size. Belief and perceptions about health care can be explained by satisfaction.

Household determinants are those variables that are common to each member of the household and enable households to seek health care. This includes household size and medical insurance.

Figure 3: Influences on Health Care Utilisation



Age is closely related to need for health care. Different age groups would differ in their pattern of utilisation. For example children, working age adults and the elderly. However children's use of health care is dependent on their parents or guardians as the latter take active role in seeking health care for children. Gender is similar to age. Health care utilisation would vary between male and female as a result of natural biological variations. For example women are more likely to utilise reproductive health services compared to men. Marital status may influence the use of health care. A household head that is married will have a different pattern of utilisation compared to unmarried household head. The utilisation of health care by a household with married head is influenced by the health care need of for example, his/her spouse, children and others under his/her care. Population group or race is a demographic characteristic that can determine the social or economic status of an individual in a particular society especially given the South African context. Income and occupation of an individual can enable him/her to secure health care services. How much an individual earns determines his decision to seek health care at a particular time. Those with higher income are more likely to use health care facilities than individuals of lower income. Education increases the utilisation of health care as information increases the preferences of individuals to consume health care. Individuals of higher education are more likely to engage in preventive practices thus reduce their use of health care. Medical insurance ownership reduces financial barriers to health care utilisation and increases the choice of using any health care provider they prefer. Those who are covered by medical insurance are more likely to use any type of health care facility compared to an individual without a third party payment. Household size influences the total expenditure of the household on health care and how often individuals within the household utilises health care. Those with larger household members are more likely to utilise health care compared to smaller household members. Beliefs in terms of health care attitudes and behaviour reflect predispositions towards health and health care. This is also closely related to the satisfaction of the use of health care in the past, which can develop into attitudes and behaviour to utilisation.

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2). Variables that describe access to health care is divided into geographic and financial determinants.

> Geographic access determinants describe differences in the land area and variations in health care resources in the country. This includes; region, rural/urban location and physical distance.
>
> Financial access determinants include variables that may restrict the use of health care; cost of healthcare, travel time and costs and third party payments (exemptions/ medical insurance)

Location of an individual whether rural/urban, influences his use of health care services. Individuals who reside in urban areas enjoy availability of services and lesser geographical barriers to health care. Since health care facilities are more concentrated in cities, individuals residing in urban areas are more likely to bear lesser burden in travelling than those in rural areas especially with hospital based care. Region of the country determines the pattern of utilisation among individuals. The allocation of health care resources among regions varies. Regions with larger share of health care resources are more likely to experience better satisfaction among individuals seeking health care. Medical insurance is also a financial access determinant of health care use because it reduces the financial barriers to health care utilisation, because it enables health care use without necessarily making initial payments.

3). Variables that describe the healthcare system are organisational determinants.

> Organisational determinants include variables that may determine the structure of the healthcare system; capacity (personnel/professionals), quality of services (satisfaction), availability of services (waiting time/opening time) and type of facility (public, private or traditional healers).

The quality of services can influence the decision to use health care services; and the type of health care provider used. An individual's choice of the type of health care to use; public, private or traditional healers is based on the tastes and preferences of the individual. The tastes and preferences for one health care provider compared to another is based on the perceptions developed. If the individual derived satisfaction from the services provided, the perception of the quality of services will be favourable.

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4). Variables that can explain the policy stance within the health care system relates to the equity objectives of the system.

Equity objectives of the system can relate to financing, regulation, legislation (fees/exemptions) and information.

The financing of health care by government in terms of the annual health care allocation set aside to provide health care services within public health care facilities can influence the level of access to health care and also utilisation. The health budget allocated to regions within the country should consider some factors. These may include the relative population sizes, differences in cost of health care provision, morbidity or mortality indicators within regions and the relative differences in SES that can influence the need of individuals. The regulation of the health care system should also consider the role of private sector, the impact of health care personnel in ensuring effective and efficient health care delivery and other stakeholders within the health care sector. The legislation of government's equity related objectives are then translated into workable guidelines for all stakeholders to ensure that the objectives are met. Information also stands as an important part of the policy process that can influence access to health care and utilisation. For instance, if individuals are not well informed about government programmes, it may influence the success of the legislation in place to improve equity in the utilisation of health care.

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4.3 Framework of Health Care Utilisation

Figure 3 also reflects the interrelations between the dimensions and factors that influence utilisation. For instance the availability of services and the capacity of the health care system will determine the quality of treatment provided in a particular health care facility. This shows the relationship between the individual and the health care system. Even if the services are readily accessible to individuals, the belief and perception about health care or knowledge about illness will impact on the pattern of utilisation. In other words satisfaction can explain the tastes and preferences of the individual and can also determine how users of health care perceive the quality of health care services. It thus, has influence on both the demand and supply side of utilisation

Social economic status of individuals and specifically the household are closely related to access for health care. Individuals of higher SES are not affected by the financial barrier to use health care. They are more likely to afford the cost of health care, burden in terms of travel time and costs are reduced. Distance and cost of transportation is not a barrier to utilise health care among individuals of higher SES. Medical insurance cover also influences their decision to use any of the health care choices available. Socio-economic status of the individual and the household status are demand side factors. These are closely associated with financial access such as cost of health care and medical insurance, which are supply side factors. Individuals or households of lower SES are more likely to encounter financial access constraints in utilising health care. Those with lower SES will only be guaranteed financial access if they are given exemptions from fees.

Access factors either geographic or financial are also related to equity objectives of the health care system. Financing of health care differs from one region or location to another. Individuals residing in regions of greater health care resources and who have the opportunity to live in urban areas may enjoy greater access to utilise health care than those in the rural areas.

Satisfaction of individuals also affects the mechanism of the demand and supply. The quality of services and the capacity of the health care system are closely associated with the attitudes and behaviour of individuals. This might also relate to the health care system (i.e. the type of facility used). There is general notion that use of private facility indicates higher social economic status (Makinnen et al. 2000 and Wadee et al. 2003). Individuals of higher SES are more likely to be covered with medical insurance, this would influence health care utilisation pattern.

The equity objectives with regards to fees/exemptions is an important access variable. It influences the utilisation among individuals of lower SES. Service costs stands as a restrictive barrier to utilisation, if poor individuals have fee exemptions they are more likely to increase their utilisation of health care.

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The framework has helped to relate the different dimension to the supply or demand side of health care. However it is difficult to draw clear lines on which dimension are solely supply or demand side oriented. In all, utilisation of health care is a function of various determinants; all should to be assessed in order to have a comprehensive description of individual health care utilisation patterns. Given the household survey datasets available for the analysis of this study, variables that will be used will be highlighted later in the methodology section.

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Chapter 5: Methodology

5.1 Introduction

This chapter describes the sources of data, data collection methods, and the definition of the list of variables that will be used for analysis in this study. Also the method used in constructing SES and the variables that were used will be explained. This will lead to the specification of the model for the study. Information about analysis of the data sets is included to help explain how results will be presented. Lastly econometric and measurement issues that are associated with the available variables within the data sets and limitations of the study will be highlighted.

5.2 Data Sources and Collection

This study employs secondary data from four South African Household surveys:

- October Household Survey (OHS) 1995
- October Household survey (OHS) 1999
- General Household Survey (GHS) 2002
- General Household survey (GHS) 2006.

These survey data sets are chosen because they provide similar and consistent information on variables relevant for this study. This property (uniformity) is necessary in assessing trends or changes in the pattern of health care utilisation over time. These South African Annual Household Surveys are conducted by Statistics South Africa (StatsSA). They are aimed at providing usable information and data on persons, workers, tourism and households within the population.

The Household Survey data sets were designed to be a good representation of the total South African population. The surveys employed either a two-stage or multi-stage sampling design. The 1995 and 1999 October household survey employed a two stage sampling procedure. The two stages involved the selection of the enumeration areas (EAs) within each stratum and the selection of households within the allocated EAs. The 1995 October survey was based on the 1991 population census EAs while the 1999 survey used the 1996 population census as basis for EAs. The EAs were stratified by

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province and area type (rural/urban). The numbers of EAs were both systematically selected with probability proportional to size. By probability proportional to size, the size of each EA in relation to the total population size was used as a basis to determine the proportion of individuals that was sampled. This is to help reduce the selection bias and to ensure that some EAs were not under represented.

The 2002 and 2006 household survey employed a multistage sampling procedure using probability proportional to sample size principles. A master sample was also drawn from the database of EAs, which was established during the 1996 population census. EAs were stratified and clustered by province and area type but the area types were further divided into Primary Sampling Units (PSUs). This was to ensure that the smaller provinces were more represented. The target population were all private households in the nine provinces and residents in workers' hostels.

The Household surveys also gave consideration for weighting of individuals and households. Weights were calculated by using the inverse or the reciprocal of the inclusion probabilities of either the households, persons or the PSUs generated in the sampling procedure used. The Household surveys are thus representative of the total population. Weighting helps to correct the bias estimation of the sample means, as it may be possible that either deliberately due to the study design or accidentally, some households are overrepresented relative to others (Deaton, 1997). To undo this bias, the sample data are weighted to make them representative of the population. To ensure that results of this study fully explains the characteristics of the total population; weights will be used in the analysis of this study.

The overall sample sizes for all individuals and households for all the different data sets are illustrated in Table 2 below. It shows that within each sample, approximately 10% of those who reported illness or injury (within the recall period of four weeks) utilised a health care facility.

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Table 2: Sample sizes and percentages of ill/injured individuals who utilised health care facility over 10 years period.

	Year of Survey			
	1995	1999	2002	2006
Sample size	130787	106617	102461	105727
Household Heads (%)	29700 (22.7)	26134 (24.5)	26302 (25.6)	28007 (26.4)
Other members (%)	101087 (77.3)	80483 (75.5)	76159 (74.4)	77720 (73.5)
Total (%)	100	100	100	100
Illness or injury reported (%)	10.76	11.18	9.65	10.29

5.3 Description of Variables in the Data sets

The variables relevant for this study which are available in the various household survey data sets are illustrated in Table 3 below. These include information about Socio Economic Status (SES), demographic characteristics of the population, perceived quality of care or satisfaction, access indicators and type of facility used. These are available in the person and household data files. This is to help get information about utilisation pattern among ill and injured individuals that is representative of the total population. Individual demographics include variables such as age, gender, marital status and race. Access indicators includes: income level, medical aid status, educational level of individuals, position in household and location of residence (rural/urban). Information about health care use is reported by the nature of consultation an individual or household has used. This is represented by the type of facility used. Type of facility is classified as public, private or traditional healers. Given that the variables required for this study would be compared for the four household survey years in order to compare trends, it is important that all variables should be similar for all years. However some variables pose some problems in this regard. Those variables that have asterisk (*) for a given year are either not available or measured in a different way, compared to other data sets. These variables are household income, location (rural/urban) and level of satisfaction with health services.

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Table 3. List of variables and their availability by different surveys

Variables	Survey			
	1995	1999	2002	2006
Age	✓	✓	✓	✓
Gender	✓	✓	✓	✓
Marital Status	✓	✓	✓	✓
Race	✓	✓	✓	✓
Household income	*	✓	*	*
Medical insurance	✓	✓	✓	✓
Level of Education	✓	✓	✓	✓
Household size	✓	✓	✓	✓
Rural/Urban	✓	✓	✓	*
Satisfaction	*	*	✓	✓
Type of facility used	✓	✓	✓	✓

Note: Unavailable data within the data sets are denoted with (*)

1). Perceived quality of care (Satisfaction): In the 1995 and 1999 household surveys, information about perceived quality of care, which was measured by satisfaction from health care use, is not available. Questions relating to satisfaction were not specific to health care but was generalised to total wellbeing, which might not reveal the valid responses that would be desired. Analysis of the variable satisfaction will be excluded from this study.

2). Rural/Urban: The 2006 data sets exclude information about respondents type of enumeration area as classified in the other household datasets as either urban or rural area. As a result the study will only report influence of the variable only between 1995 and 2002.

3). An individual or household income: The variable related to individual income is only applicable to workers while questions about household income are only available in the 1999 datasets. The 1995 datasets only have information about source of income of

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household. The 2002 and 2006 datasets contain information about household expenditure rather than income. Although it is possible to merge the worker file in the data sets to determine the income of individuals, however those households without formal employment will be excluded from the sample. Due to inadequacy of data, asset index will be constructed to generate household wealth. This will be done by using Principal Component Analysis (PCA). Also households will be classified into different wealth quintiles to enable the analysis of SES of households on health care utilisation for all the datasets.

5.3.2 Generating SES Using Principal Component Analysis (PCA)

A measure of SES using asset or wealth index among households and individuals has been found necessary due to lack of reliable information/data on income or expenditure. (Onwujekwe, 2005). The PCA is a multivariate statistical technique that is used to reduce the number of variables in a data set into smaller components (Vyas and Kumaranayake, 2006). PCA helps in addressing the problems encountered in the collection or analysis of income, consumption or expenditure information. In addition, the fact that income, consumption or expenditure information have been found not to adequately capture the true Socio Economic Status (SES) of individuals requires the use of asset indices (ibid). PCA has been used to aggregate a range of variables to derive a uni-dimensional measure of SES, which can also be used to classify individuals into different socio-economic groups. To construct an index of SES or wealth index using PCA will require the selection of variables that are (theoretically and/or empirically) indicators of socio-economic status (Vyas and Kumaranayake, 2006; Okorafor, 2008).

Variables that have been used in the literature include durable asset ownership (such as TV, radio, motorcar, bicycle, telephone), infrastructure and housing characteristics (such as source of water, electricity, dwelling type, sanitation facility), ownership of land and farm animals, demographic conditions (such as level of education of household head, crowding index i.e. the ratio of the number of people to number of rooms) and other economic conditions such as amount spent on food or occupation of household head (Schellenberg et al. 2003; Onwujekwe ,2005; Vyas and Kumaranayake, 2006; Okorafor, 2008) .

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For this study, only the variables illustrated in Table 4 were considered for the analysis of the PCA. Household SES variables are in the form of the ownership and type of dwelling and other assets, electricity, water, sanitation and other facilities. The level of education of household head is also a good indicator of SES, but it was not included in the PCA because it is an important variable in explaining variations in health care utilisation. It would be better to include level of education of household head as a stand-alone variable because it would then be possible to establish the influence of education on utilisation. It would have been ideal to include other durable assets (such as motor vehicle, bicycle, radio, bed, tractor, watch etc) in the PCA; however, access to telephone in dwelling is the only durable asset available in all the four household surveys datasets.

Table 4: Variables used for Generating Asset Index

	Variable name	Classification	Details
1	Dwelling type	Formal	Includes house on a separate stand, a flat or an apartment in a block of flats and a room or flatlet on a shared property
		Informal	Includes shacks or shanties in informal settlements
2	Water	Yes	Piped water in dwelling
		No	No piped water in dwelling
3	Telephone	Yes	Telephone in dwelling
		No	No telephone in dwelling
4	Toilet facility	Yes	Flushed toilet in dwelling
		No	No flushed toilet in dwelling
5	Electricity	Yes	Access to main supply of power
		No	No access to main supply of power
6	Walls material	Formal	Includes walls made with bricks, cement block/concrete and wood.
		Informal	Includes walls with prefab, corrugated iron/zinc, plastic, cardboard, wattle daub, mud and thatching.
7	Rooms per person	Average number of rooms per person	Total number of rooms in dwelling / household size

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5.4 Data Analysis

The unit of data analysis for the general household survey data involves both individual and their households. The unit of analysis for the pattern of health care utilisation is the individual respondents while the household is the unit used to generate asset index for classifying households into SES.

To assess inequity in health care utilisation, the dimensions of determinants of health care utilisation developed in the conceptual model as seen in section 4.2 is used. These are based on financial and geographic access variables (Medical aid and household wealth index, rural/urban), individuals' demographic and SES variables. Firstly, a descriptive analysis of patterns of health care choices and related constraining factors or determinants across the various socio-economic groups and population groups will be done in the next chapter using cross tabulations. At this stage health care choices or outcomes as specified in section 5.4 will be used to explain the samples.

The second part of the analysis will involve the use of regression analysis. The effect of all the explanatory variables specified will be presented. Since location is not available in 2006 datasets, the regression analysis will exclude location in order to ensure comparability of the results over the years. Another regression analysis will be done for 1995, 1999 and 2002 datasets that will include location. This is to determine the effect of location on health care utilisation since location has been identified as an important factor that could influence health care utilisation in previous studies.

Lastly, given that the outcomes of the dependent variable excludes those who did not seek health care, a binary response regression model will be done to explain the relationship between health care utilisation and non utilisation on the explanatory variables specified. This is to help understand the characteristics of individuals who utilised health care facility compared to those who did not utilise health care.

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5.4.1 Econometric Model for Categorical Dependent Variables

Regression analysis is concerned with the measurement of the strength of the relationship between variables and the estimates of the response of the dependent variable (Y), given the values of the independent variables, (X). The aim of the regression analysis is to ascertain how the average value of the dependent variable varies with changes in the values of the independent variable. In regression analysis the nature of the dependent variable determines the type of model to use. The dependent variable can be quantitative or qualitative. A model with a quantitative dependent variable is aimed at estimating the expected value of the dependent variable given the values of the independent variable (s) while a qualitative dependent variable is aimed at estimating the probability that an outcome occurs. A qualitative dependent variable can either be binary; in which the responses of the dependent variable is two. For instance, suppose we are interested in studying the factors that influence consultation of General Practitioners (GP), there will be two responses: "1" if the person consults a GP

"0" if the person did not consult a GP

This can be analysed by using the logit or probit models. The logit model will be useful in explaining the relationship between utilisation of health care and no utilisation, as identified in the analysis section. In this case, the coefficient (β) of the independent variable X, measures the changes in the log of odds for a unit change in X. In other words if the coefficient is positive, it implies that as X increases, the odds that Y=1 increases and *vice versa.*

However, in other instances, the responses of the dependent variable are more than two or in multiple categories. In this case and for this study, an individual may have different choices of health care providers or health care facility to seek health care from. The choices or responses of an individual include private, public, traditional healers' health care facility or not seeking health care at all. This study uses the multinomial logit model. This model is used because the dependent variable has more than two outcomes and the outcomes are not ordered.

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Lastly the results of the model will help to determine whether the coefficients of the explanatory variables are consistent with vertical equity policy objective that was specified. Equity in the utilisation of public facility will be consistent with vertical equity if the coefficient of the access and SES related variables (such as asset index, level of education medical insurance) reveals that individuals of lower SES have higher utilisation of health care services. This will be presented in the results and discussion in the next chapter.

5.5 The Model Specification

A multinomial logit model is chosen for the empirical analysis of a multiple categorical response dependent variable that has been opted for in this study.

The regression model can be expressed as:

Utilisation = $\alpha + \beta 1$ (Age) + $\beta 2$ (Gender) +$\beta 3$ (Race) +$\beta 4$ (HHEduc) + $\beta 5$ (Medical aid) + $\beta 6$ (HHMstatus) + $\beta 7$ (Assetindex) + $\beta 8$ (Location) + $\beta 9$ (HHsize) + u

Where the βs are the coefficients of the Xs, while α is the constant and the u is the error term.

Utilisation of health care by an individual is denoted by where health care consultation took place when illness or injury is reported. This can also be seen as the choices of health care available when individuals who are ill/injured consult a health care provider. These choices are the possible outcomes of the dependent variable. The outcomes will range from 0- 2. These are:

0 = Sought health care in the public facility

1 = Sought health care in the private facility

2 = Sought health care from a traditional healer.

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Utilisation of health care in the public facility has been chosen as the base category for this study because public facility is the main provider of health care services to the poor. It is within the public facility that it will be possible to determine the pattern of health care utilisation of those with higher need within the population when comparing with other health care providers (such as private facility or traditional/spiritual healer).

The multinomial logit model in which the probability of an individual to choose an outcome (say use of public facility over other possible alternatives) can then be expressed thus:

$$P_{ij} = \exp(x_i\beta_{j} + z_{ij}Y) / \Sigma_k \exp(x_i\beta_k + z_{ik}Y)$$

Where the coefficients (β_j) on the explanatory variables vary across the choices of outcomes j. Z_{ij} includes all individuals' choices and Y is the coefficients on the variables that vary across the choices.

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5.5.1 Explanatory Variables

Table 5 provides a detailed description of the independent variables used in the regression model.

Table 5: List of explanatory variables for the models.

Variables	Details	Relationships
Age	Children (0-17) = 0, Adults (18-65) = 1, Elderly (above 65) = 2.	Utilisation of health care is more likely to vary significantly among the different age groups due to differences in need for health care.
Gender	Female = 0, Male = 1	Male are less likely to utilise public health care compared to females, as the latter use more of reproductive health care.
Household Married Head	Married head = 0, single head = 1.	Utilisation of health care is more likely to increase among married head due to maternal and child bearing conditions.
Race/population group	African = 0, Coloured = 1, Indian = 2, White = 3	Use of public health care is more likely to increase among the African and Coloured population groups compared to others due to lower socio-economic status.
Household Wealth index	Continuous	Utilisation of health care is more likely to increase as household wealth index increases.
Level of Education of household head	No formal education =0, Primary education = 1, Secondary education = 2, Tertiary education = 3	As level of education increases, the higher the probability of choosing private health care due to taste and preferences.
Medical insurance	No = 0, Yes = 1	Those with medical insurance have higher probability of choosing private health care compared to those without medical insurance.
Location	Rural = 0, Urban = 1	Individuals in the urban areas are more likely to utilise private facility due to higher socio-economic status.
Household size	Continuous	As household size increases, the higher the probability of choosing public facility due to financial burden.

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5.6 Limitations of Data Sources and Study Design

The design of secondary data like household surveys is aimed at presenting an overall view of the individuals in the population. This may seem convenient in that the investigator works on already coded variables which make analysis easier. However, there are limitations to the extent to which the initial purpose of the secondary data can be adapted to prospective studies. Some of the problems encountered may be in respect to response rate, sample selection bias, missing data, wording of questions or its coding. Some of the limitations that have been identified are outlined as follows:

1).The study designs required respondents to recall various aspects of their health care seeking behaviours. The recall period of one month may pose a risk of measurement error in the sense that respondents may not recall the required information correctly. A shorter recall period for instance 2 weeks may be more accurate in revealing the actual tastes and preferences of individuals to use of health care services (Abramson and Abramson; 1999).

2).There is also a sample selection bias because the study only includes those individuals who have witnessed an episode of illness or injury during the recall period. Therefore the tastes and preferences of individuals who are not ill or injured are not put into consideration. It may be more representative to consider choices of individuals in the event of a future use of health care services.

3). All the variables that had been identified in the conceptual framework are important for the analysis of this study. However information about the capacity of the health care system, availability of services and information on financing, regulation and level of information regarding equity objectives are not available in the datasets. Availability of this information would have helped to further understand the effect of the supply side factors on health care utilisation.

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4) The 1999 OHS data does not contain data on non-utilisation of health care services. So in the specification of the model, the number of outcomes for the categorical dependent variable excludes those who did not seek health care. Based on this data analysis included the use of a binary response model. The outcomes of the logit model will be 1 if individual was ill/injured and sought health care; =0 if individual was ill/injured but did not seek care. Hence the analysis of the binary response model excludes 1999 OHS from the analysis of use and non use of health care among ill/injured individuals.

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CHAPTER 6

Discussion of Study Results on Health Care Utilisation Patterns 1995-2006.

6.1 Descriptive Statistics and Frequencies

6.1.1 Demographic and socio-economic Status

The results of the study (as shown in Table 6) indicated that the average age group composition for all household survey years is approximately 41.7% for children, 53.1% for adults and 4.9% for the elderly between 1995 and 2006. Females also constituted the majority of respondents for all the years. In respect to racial composition, the percentage of African/Blacks has increased from 71% in 1995 to 79% in 2006.

Table 6: Demographic and socio-economic characteristics of individuals and their households

Variables	1995	1999	2002	2006
Age (%)				
0= children (0-17)	42	42.6	41.3	41.1
1= Adults (18-65)	53	52.6	53.4	53.5
2= Elderly (>65)	4.9	4.7	5.1	5.2
Total	100	100	100	100
Gender (%)				
1= Male	47.2	47.7	47.4	46.7
0= Female	52.8	52.3	52.5	56.2
Total	100	100	99.9	100
Race (%)				
0= African/Black	71	78.6	77.8	78.9
1= Coloured	13	11.4	11.3	13.4
2= Indian	3	2.4	2.4	1.7
3= White	12	7.7	8.3	5.8
Total	100	100	100	100
Level of education of individuals (%)				
0= No Education	22	20.4	20.0	19.8
1= Primary	35	38.9	35.9	35.5
2= Secondary	36.7	34.6	37.7	39.8

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3= Tertiary	5.7	5.9	6.1	4.8
Total	100	100	100	100
Marital Status of household head (%)				
1= Married	62.4	51.7	54.6	40.0
0= Not married	37.6	48.2	45.3	59.9
Total	100	100	100	100
Location (%)				
Rural	51.71	51.71	59.17	-
Urban	48.29	48.29	40.83	-
Total				
Household Characteristics				
Electricity (%)				
Main supply for electricity	46.4	39.8	43.2	40.0
No supply for electricity	53.6	60.1	53.7	59.9
Water supply (%)				
Piped water in dwelling	37.9	34.1	37.0	34.0
No piped water in dwelling	62.1	65.8	62.9	65.9
Toilet facility (%)				
Flushed toilet in dwelling	11.8	29.7	32.5	27.6
No flushed toilet in dwelling	88.2	70.2	67.4	72.4
Average No. of rooms per person (SD)	1(0.8)	0.9(0.7)	1.1(2.5)	2(7)
Type of walls material (%)				
Formal	76.4	69.9	73.8	72.6
Informal	23.5	30.0	26.1	27.3
Dwelling type				
Formal	69.4	71.5	70.0	68.4
Informal	30.5	28.5	29.9	31.6
Telephone in dwelling				
Yes	0.2	30.8	24.7	15.8
No	99.7	69.2	75.2	84.1
Household Wealth distribution				
Quintile 1 (Poorest)	5947 (20.0)	5216 (20.0)	5274 (20.0)	5613 (20.0)
2 (Second)	6022 (20.2)	5223 (20.0)	5259 (19.9)	5710 (20.3)
3 (Middle)	5856 (19.7)	5166 (19.8)	5250 (19.9)	5547 (19.8)
4 (Fourth)	6706 (22.5)	5196 (19.9)	5280 (20.0)	5547 (19.8)
5 (Richest)	5169 (17.4)	5191 (19.9)	5239 (19.9)	5590 (19.9)
Total	29700 (100)	26134 (100)	26302 (100)	28007 (100)

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The proportion of the population that are Coloured remained consistent, however the proportion that are White and Indian declined by about 48% and 40% respectively between 1995 and 2006. The proportion of the population with no formal education and those with tertiary education decreased over the years; the reverse is the case for those with primary or secondary education. The percentage of household heads that are married has declined. The proportion of individuals in the rural areas has increased. The section that shows households characteristics indicates that access to electricity and water supply has reduced while use of hygienic sanitation system has increased.

6.1.2 The Socio-economic Status Index of Households in the population

This section presents the results of the PCA that was used to generate wealth/asset index from the list of variables. This is shown in Table 7.

Table 7: The scoring of household's asset index in the population

Variable	Scoring coefficients			
	1995	1999	2002	2006
Dwelling	0.40169	0.30638	0.35355	0.40169
Toilet-facility	0.44849	0.45139	0.46395	0.44849
Electricity	0.37166	0.39944	0.39993	0.37166
Telephone	0.33093	0.37715	0.36368	0.33093
Walls-material	0.41450	0.36194	0.37845	0.41450
Water	0.46505	0.45656	0.46602	0.46505
Room-per-person	0.04199	0.24727	0.08452	0.04199

The output of the PCA is a table of scoring coefficients for each variable that is used to generate an index of what is to be measured (Vyas and kumaranayake, 2006). In this instance, the variables used are to generate a component that will determine SES variable or asset index. The results showed that the factor score for each variable is positive. A positive score means that an increase in the variable is associated with higher levels of SES. Most of the variables used to generate the SES index have a positive value and their values are very close (mean value of 0.34). This implies similar levels of linear association between each variable and the generated asset index. An increase in the SES index is associated with higher levels of SES. Similarly a decrease in the SES index will

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be associated with lower level of SES. This SES index generated will help to explain the association between health care utilisation and SES.

6.1.3 Breakdown of Households SES by Race

Table 8 showed that, there were class differences in wealth among the racial groups over the ten year period.

Table 8: Trends in Households Socio-economic Classification by Race

1995			Quintile			
Race	1	2	3	4	5	Total
African	27.9	25.2	21.3	18	7.5	76.3
Coloured	1.9	14.4	23.2	43.2	17.5	8.6
Indian	0.01	0.09	1.1	45.1	43.1	2.5
White	0.01	0.03	2.1	23	74.5	12.5
1999			**Quintile**			
Race	1	2	3	4	5	Total
African	26.3	24.7	23	17	8	77.9
Coloured	3.8	9.8	9.5	36	40	8.9
Indian	0	2.2	1.4	20	76	2.5
White	0	0	0.02	0	91.5	10.5
2002			**Quintile**			
Race	1	2	3	4	5	Total
African	26.2	23.9	23.3	17.4	9	79.2
Coloured	3.2	11.1	9.2	36.1	40.3	8.8
Indian	0.01	0.05	1.2	22.2	75.8	2.4
White	0.01	0.02	0.02	17.3	82	9.4
2006			**Quintile**			
Race	1	2	3	4	5	Total
African	22.5	24.9	23.1	17.8	11.4	79.4
Coloured	2.8	10.8	8.2	25.3	53.3	8.8
Indian	0.01	3.5	2	41.8	52.3	2.4
White	0.01	0.06	0.05	17.8	80.8	9.2

Note: The total value by row is the proportion of the race group that constitutes the total population. The proportion of wealth quintiles are by column. So out of 76.3% of the African/Blacks that make up the total population, 27.9% of them are in the lowest wealth quintile.

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The proportion of African/Black within the lowest quintile has reduced from 27.9% in 1995 to 22.5% in 2006. The Coloured population group within the lowest quintile have increased from 1.9% in 1995 to 2.8% in 2006, while the Indian and the White population

within the lowest quintile have remained consistent, even though their overall proportion of the population has declined.

The proportion of Africans in the richest quintile is smaller compared to the other population groups. The increasing population size among the African/Black majority over the ten year period did not show any significant association with the proportion of the population group in the richest quintile. While the proportion of African/Blacks in the richest quintile increased from 7.5% in 1995 to 11.4% in 2006 (i.e. 3.9% increase), the White and the Indian population showed a higher increase in the percentage of those in the richest quintile. The White and the Indian population in the richest quintile increased with 9.2% and 6.3% respectively over the ten year period even with a decrease in proportion of population groups from the total population. This implies that majority of the African/Blacks are still of lower SES.

6.1.4 Trends in Health care Utilisation

This section presents results of cross tabulations between choice of health care use and the various potential determinants of health care utilisation. Table 9 below illustrates that the use of public facility has increased over the years from 60.1% in 1995 to 61.4% in 2006; private health care use also increased between 1995 and 2002, but has declined presently as indicated in 2006. Between 1995 and 2006 private health care use has reduced by 0.05%. Also use of traditional/spiritual healer has reduced and among all the age categories. The use of public facility by the vulnerable groups (i.e. the elderly and children) has reduced while there is an increase in the use of private facility. Those who have been specified as potential beneficiaries (children and elderly) of free public health care are utilising private facility in the same manner as other age groups.

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Table 9: Trends in utilization pattern by age

1995	Facility			
Age category	Public	Private	Traditional	Total
Children	66.8	32.1	1.1	34.4
Adults	56.3	41.7	1.8	56.6
Elderly	60.9	37.5	1.5	8.9
Total	60.3	38.1	1.5	100
1999	Facility			
Age category	Public	Private	Traditional	Total
Children	56.3	42.7	0.09	27.7
Adults	48.7	49.1	2.1	61.1
Elderly	54.5	44.8	0.06	11.1
Total	51.5	46.8	1.6	100
2002	Facility			
Age category	Public	Private	Traditional	Total
Children	56.2	43.2	0.05	30.3
Adults	57.2	41.5	1.2	59.6
Elderly	61.7	37.4	0.07	9.9
Total	57.3	41.6	1.0	100
2006	Facility			
Age category	Public	Private	Traditional	Total
Children	62.6	36.5	0.08	30.8
Adults	60.7	38.2	1.01	58.8
Elderly	61.6	37.6	0.07	10.2
Total	61.4	37.6	0.09	100

Note: the proportion of age categories is by rows. That is, 66.8% of children ill/injured used the public facility and 34.4% of the total population who sought health care are children. Total by row is the proportion of the different age categories that sought health care while total by column is the proportion of population that used the different health care choices/facilities when ill/injured.

Table 10 illustrates the differences in the choices of health care between males and females. Use of public facility by females has increased over the ten year period from 59.9% in 1995 to 62.5% in 2006, while private health care utilisation has decreased (38.4% in 1995 to 36.7% in 2006). Among males, the pattern is different, private health care use has increased (37.6 in 1995 to 38.6% in 2006)and public health care use has declined (60.7% in 1995 to 60.1% in 2006).

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For traditional/spiritual healers' facility, the percentage of males (1.8% in 1999) utilising traditional/spiritual healers is higher compared to females (1.5% in 1999), although there is a declining trend for both males and females.

Table 10: Trends in utilisation pattern by gender

1995	Facility			
Gender	Public	Private	Traditional	Total
Male	60.7	37.6	1.5	46.1
Females	59.9	38.4	1.5	53.8
Total	60.3	38.1	1.6	100
1999	Facility			
Gender	Public	Private	Traditional	Total
Male	50.1	47.9	1.8	41.5
Females	52.4	46.1	1.5	58.4
Total	51.5	46.9	1.6	100
2002	Facility			
Gender	Public	Private	Traditional	Total
Male	55.2	43.5	1.2	43.2
Females	58.9	40.1	0.08	56.8
Total	57.3	41.6	1.0	100
2006	Facility			
Gender	Public	Private	Traditional	Total
Male	60.1	38.6	1.3	43.1
Females	62.5	36.7	0.07	56.8
Total	61.4	37.6	1.0	100

Note: the proportion is by row (gender), total by row is the proportion of the gender from the overall population that used any of the health care facility. That is, in 1995 the total proportion of males that sought health care when ill/injured is 46.1% while 60.7% of them utilised the public facility.

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6.1.4.1 Trends in Utilisation Pattern by Race, Level of Education and SES.

Table 11 below shows a difference in the choice of health care use by the different racial groups. In total, the use of public health care showed an inconsistent pattern between 1995 and 2006. The trend is also similar for private health care use, while use of traditional/spiritual healers has declined. The percentage of African/Blacks who were ill/injured, that sought health care increased from 66.4 % in 1995 to 81.4% in 2006. For the other population groups, there is a decline in the use of health care.

Table 11: Trends in utilisation pattern by race

1995			Facility	
Race	Public	Private	Traditional	Total
African	71.1	26.7	2.2	66.4
Coloured	63.1	36.7	0	7.9
Indian	41.1	57.9	0.09	4.6
White	29.4	70.2	0.03	20.9
Total	60.3	38.1	1.6	100
1999			Facility	
Race	Public	Private	Traditional	Total
African	59.6	38	2.2	68.8
Coloured	58.1	41.7	0	10.2
Indian	36.9	63	0	4.5
White	17.3	82.4	0.02	16.5
Total	51.5	46.8	1.6	100
2002			Facility	
Race	Public	Private	Traditional	Total
African	63.6	35.1	1.2	77.3
Coloured	61.2	31.8	0	8
Indian	38	61.9	0	3.6
White	16.9	82.5	0.04	10.9
Total	57.3	41.6	1.01	100
2006			Facility	
Race	Public	Private	Traditional	Total
African	66.7	32	1.1	81.4
Coloured	64.2	35.7	0	7.1
Indian	47.5	52.4	0	2.1
White	15.4	84.5	0	9.3
Total	61.4	37.6	0.09	100

Note: the proportion is by row (race group), total by row is the race group from the overall population ill/injured that sought health care while total by column is the total population that sought health care from the different health care facility. That is, in 1995 out of 66.4 % of African/Blacks ill/injured that sought health care, 71.1% of them utilised the public facility, 26.7% used the private facility while 2.2% used the traditional/spiritual healer.

For the Whites and the Indians the decreasing trend in the size of the population may be associated with the decline in the use of health care. The utilisation of public sector facilities is also higher among the Black/Africans compared to other groups while private health care utilisation among the Whites and Indians is greater implying higher SES due to greater ability to pay for health care.

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Table 12 illustrates the income/wealth effect on health care utilisation within the population. There is a positive relationship between private health care utilisation and SES. As individuals move to a higher SES quintile, the higher their use of private health care.

Table 12: Trends in utilisation pattern by SES

1995			Facility	
Quintile	Public	Private	Traditional	Total
1	82.3	14.2	3.4	17.3
2	75.2	22.9	1.7	15.9
3	66.3	31.5	2.1	16.4
4	56.9	42.3	0.07	23.5
5	36.5	62.7	0.07	26.7
1999			Facility	
Quintile	Public	Private	Traditional	Total
1	73.5	22.8	3.6	15.8
2	67.1	30.6	2.2	16.7
3	62.5	35.2	2.2	17
4	55.3	43.8	0.08	19.2
5	23.7	75.8	0.04	31.2
2002			Facility	
Quintile	Public	Private	Traditional	Total
1	76.5	21.6	1.8	18.2
2	71.5	26.7	1.7	15.9
3	64.8	33.6	1.5	20
4	55.2	44.3	0.03	20
5	30	69.8	0	25
2006			Facility	
Quintile	Public	Private	Traditional	Total
1	74.9	23.3	1.7	19
2	73.4	24.9	1.6	19.9
3	74.8	24	1.1	18.2
4	55.6	44	0.03	20
5	33.8	65.9	0.01	22.7

Note: proportions are by rows (Quintile). So it means in 1995, 82.3% of those in the lowest quintile used the public facility when they were ill/injured.

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In addition, as individuals move to a higher SES quintile the lower the use of public facility. Those within the lowest SES use more of public facility than those with higher SES. This may suggest that the public facility is providing for the needs of the poor. For traditional/spiritual healers the pattern is also similar with individuals in the poorest quintile reporting greater use of traditional/spiritual healers.

To ascertain whether differences in SES within the population also reflect disparities among population groups is also important in order to determine which group is mostly affected by poor SES on their health care use. For easy interpretation, Table 13 only presents information between the poorest and the richest quintile. The data presented show a distinction between the African/Blacks and coloured population group on one hand and Indian and white population group on the other hand.

Table 13: Trends in utilisation pattern by SES within population groups

	Poorest Quintile				Richest Quintile			
Black/Africans								
Facility/year	1995	1999	2002	2006	1995	1999	2002	2006
Public	81	71.9	75.2	76.1	53.3	27.5	35.5	43.1
Private	15.6	24.2	22.9	22.4	45.1	71.3	64.3	56.5
Traditional	3.3	3.8	1.7	1.4	1.4	1	0.1	0.3
Coloured								
Facility/year	1995	1999	2002	2006	1995	1999	2002	2006
Public	87.1	90	70	95.8	53.4	43	49.7	53.3
Private	12.8	10	30	4.1	46.5	56.9	50.2	46.6
Traditional	0	0	0	0	0	0	0	0
Indian								
Facility/year	1995	1999	2002	2006	1995	1999	2002	2006
Public	0	0	0	0	42.1	30.2	36.1	41
Private	0	0	0	0	56.4	69.7	63.8	58.9
Traditional	0	0	0	0	0.8	0	0	0
White								
Facility/year	1995	1999	2002	2006	1995	1999	2002	2006
Public	0	0	0	0	29.5	15	14	17.4
Private	0	0	0	0	69.9	84.8	85.9	82.5
Traditional	0	0	0	0	0.4	0.1	0	0

Note: proportions are by row (facility type). That is, among African/Blacks in the poorest quintile, 81% of them used the public facility in 1995 when they were ill/injured.

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Among the African/Blacks and the coloured population group in the poorest quintile over the ten year period, over 70% use public facilities unlike the Indian and White population that reports no public health care use within the poorest quintile. Within the richest quintile the pattern is similar for the African/Blacks, coloured and the Indian population groups with higher utilisation of public facilities. Among African/Blacks, coloured and the Indian population groups, over 40% use public facility in 2006, while the White population only records 17.4% use of public facility in the same year.

It is important to note that private health care utilisation among African/Blacks within the poorest and the richest quintile showed an increasing pattern. This may imply two things: that the quality of services in the public facilities has resulted in greater preference of the poor to use private health care. Secondly it might be that access to utilise public health care by poor individuals is lower.

Table 14 illustrates health care utilisation patterns by levels of education. The effect of education on utilisation may not be direct since, other factors such as location, wealth or income and other SES factors could influence choice of health care. Due to the fact that age limits the level of education an individual acquires, the analysis of these data used level of education of households' head on the total sample of individuals. Utilisation of public facilities and traditional/spiritual healers is higher among those who reside in household where household head has only primary education and no formal education over the ten year period compared to private facilities. As expected, there is a positive association between higher levels of education and use of private health care utilisation.

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Table 14: Trends in utilisation pattern by level of education

1995		Facility		
Education level	Public	Private	Traditional	Total
No education	75.8	20.8	3.3	18.2
Primary	74	24.1	1.8	26.3
Secondary	52.5	46.6	0.09	41.9
Tertiary	37.3	61.8	0.08	13.5
1999		Facility		
Education level	Public	Private	Traditional	Total
No education	70.7	26.4	2.8	16.9
Primary	68	30.1	1.7	29.2
Secondary	43	55.6	1.3	38.7
Tertiary	19.5	79.7	0.07	15
2002		Facility		
Education level	Public	Private	Traditional	Total
No education	71.2	26.8	1.9	19.5
Primary	71.9	27.2	0.08	29.8
Secondary	50.9	48.1	0.08	39.5
Tertiary	16.6	82.9	0.03	11.1
2006		Facility		
Education level	Public	Private	Traditional	Total
No education	64.6	33.8	1.4	23.6
Primary	74.5	24.3	1.1	28.9
Secondary	56.4	42.9	0.06	40.6
Tertiary	24.3	75.3	0.03	6.8

Note: proportions are by rows. That is, in 1995, out of 18.2% of those with no formal education that sought health care (when ill/injured), 75.8% of them used the public facility.

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Finally Table 15 shows levels of utilisation by ownership of medical insurance. In total the percentage of medical insurance ownership has decreased considerably from 28.2% in 1995 to 17.8% in 2006. The proportion of individuals with medical insurance who utilised public health care (32.3% in 1995 to 11.4% in 2006) is lower compared to private health care use (66.9% in 1995 to 88.3% in 2006). This suggests that medical insurance is an important access and SES factor and it influences the choice of health care use among individuals. In general, utilisation of public and traditional/spiritual healer

facility has reduced over the years among those with medical insurance, whereas there is an increasing trend in the use of private health care.

Table 15: Trends in utilisation pattern by ownership of medical insurance

1995	Facility			
Medical insurance	Public	Private	Traditional	Total
Yes	32.3	66.9	0.06	28.2
No	71.3	26.6	1.9	71.7
Total	60.3	38.1	1.5	100
1999	Facility			
Medical insurance	Public	Private	Traditional	Total
Yes	13.4	86.3	0.02	25.5
No	64.5	33.3	2.1	74.4
Total	51.5	46.8	1.6	100
2002	Facility			
Medical insurance	Public	Private	Traditional	Total
Yes	11.3	88.2	0.04	21.5
No	69.9	28.8	1.1	78.4
Total	57.3	41.6	1.0	100
2006	Facility			
Medical insurance	Public	Private	Traditional	Total
Yes	11.4	88.3	0.01	17.8
No	72.2	26.6	1.1	82.1
Total	61.4	37.6	0.09	100

Note: proportions are by rows. That is, out of 28.2 % of those ill/injured who sought health care in 1995, 32.2% used public facility, 66.9% used private facility while 0.1% used traditional/spiritual healer facility.

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6.2 Multivariate Analysis

6.2.1 Results of the Multinomial Logistic Regression Model

The multinomial logit model for the four household surveys was estimated with a sample of observations as shown in Table 16 below. The results of the model are statistically significant with the chi2 test of 0.000 as shown also in Table 17.1 and Table 17.2.

Table 16: Number of observations for the different household surveys.

Year	Number of observations
1995	14072
1999	11279
2002	8901
2006	10852

6.2.2 Significant Variables

The model explains the choice of health care utilisation between public and private health care facility (as shown in Table17.1) and between public and traditional/spiritual healers' facility (as shown in Table17.2) which are dependent on individual/ household characteristics and access related factors. It also illustrates a summary of the regression results over 10 year period between 1995 and 2006.

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Table 17.1: Regression results for the Multinomial Logit model [Private vs. Public]

Year/Variable	1995	1999	2002	2006
	Coefficient Estimates	Coefficient Estimates	Coefficient Estimates	Coefficient Estimates
Dependent Variable				
Base Category: Non utilisation				
Independent Variables				
Adults	0.23918***	0.2870***	0.0124	0.0047
Elderly	0.4564	0.1420	0.1171	0.1499
Gender	0.1089***	0.001	- 0.0257	0.1164**
Coloured	0.0397	- 0.668***	- 0.473***	- 0.472***
Indian	0.7361***	0.07281	0.1467	0.1321
White	0.6553***	0.0572	0.3034*	0.9637***
Marital status of head	0.1577***	- 0.3067***	0.3946***	0.5338
No education	- 0.4162	0.914***	- 0.1122	- 1.1151
Primary education	- 0.4216**	- 0.934***	0.1297	0.1732***
Secondary education	0.4162***	0.538***	0.9532***	0.7361***
Asset Index	0.2047 ***	0.2120**	0.1726***	0.1452***
Household size	- 0.0145	- 0.0221**	- 0.0301**	- 0.074***
Medical insurance	- 0.9292***	1.7793***	2.223***	- 2.366***
Constant	0.7813	- 1.164	- 0.9581	- 3.5884

Note: *** = significant at 1% level of significance, ** = significant at 5% and * = significant at 10%. The base categories are children (for age category), females for gender, African/Black for (population group), tertiary education for (education of household head) and rural for location.

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6.2.2.1 Private Vs Public facility

Age

From the results, there are differences in the use of health care facilities among the age categories. There is a consistent positive trend in the use of private facility by adults as compared to children, although this is significant only for 1995 and 1999 (i.e. Adults are more likely to use a private health care facility than public facility when compare to children). However from 2002, the results showed that the pattern has changed. Age no longer influences the choice of whether to use a public or private health care facility.

Gender

Males are more likely to seek health care in the private facility than public facility as compared to females. There is an inconsistent trend in the use of private facility by males compared to females. The likelihood that males are more likely to use private facility than public facility when compared to females is significant for only 1995 and 2006. This suggests that gender still influences the choice of health care in the population.

Race

The coloured population are consistently less likely to use private facility as compared to African/Blacks. The results for the Indians and the White population group showed a consistent greater likelihood in the use of private facility than public facility when compared to African/Blacks. Indians and the Whites are more likely to utilise private facility than public facility as compared to African/Blacks. For the Indians the result is significant for 1995 only while for the Whites it is significant for all the years except for 1999. This suggests that the coloureds and the African/Blacks have higher probability to use more of public facility than private when compared to the Indians and the Whites. This may imply that those with higher need (i.e. the Coloureds and the African/Blacks) are more likely to use more of public facility than private as it should be expected if equity principle is consistent with vertical equity. This suggests that the pattern of health care utilisation among the coloureds and the African/Blacks has changed with a pattern that promotes equitable health care utilisation.

Marital Status of Household Head

The effect of marriage on pattern of private facility utilisation showed an inconsistent trend compared to public facility. Individuals who reside in households where household head is married are more likely to use private facility than public facility compared to households where the household head is unmarried. This result is indicated for 1995 and 2002 datasets. For 1999 reverse is the case. However the 2006 result showed that marital status of household head no longer have a significant influence on the choice of health care use by individuals in the household.

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Level of Education of Household Head

The effect of level of education of the household head from which a household member resides on private health care facility compared to public facility showed that the coefficients of level of education are inconsistent over the ten year period. For household members whose household head have no formal education, individuals within the household are less likely to utilise private facility than public facility when compared to those with tertiary education for all the years except for 1999. For household member that resides in a household where household head has primary education; they are less likely to utilise private facility than public facility compared to those with tertiary education. But the trend has changed since 2002, as those with primary education are consistently more likely to utilise private facility than public facility when compared to those with tertiary education. Though the result for 2002 is insignificant but it follows a similar pattern with secondary education, that there is a consistent positive trend that household member that resides where the household head has secondary education, are more likely to utilise private facility than public facility, compared to household members whose household head has tertiary education over the 10 year period. It would have been expected that comparing tertiary education with lower levels of education would indicate a negative trend. However possible explanation of this result may be due to the fact that the percentage of tertiary education holders among household members is small.

SES

The result on asset index reveals the positive impact of SES on utilisation of private facility compared to public facility. A unit increase in asset index increases the likelihood of individuals to utilise private facility than public facility over the 10 year period. This suggests that wealthier individuals are more likely to utilise private facility than public facility. The impact of higher SES on private health care utilisation remains consistent over the years compared to public facility.

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Household Size

The impact of SES on private facility utilisation can also be further explained by the household size. There is a negative consistent trend in the use of private facility than public facility. A unit increase in the number of household members decreases the likelihood that individuals will utilise private facility compared to public facility between 1999 and 2006. This suggests that smaller households are more likely to utilise private facility than public facility, since financial costs to utilise private health care would be lower.

Ownership of medical Insurance

The effect of ownership of medical insurance showed an inconsistent trend in the use of private health care over public facility over the 10 year period. The model shows that those with medical insurance are more likely to utilise private facility than public facility between 1999 and 2002. However the results for 1995 and 2006 show otherwise, those with medical insurance are less likely to utilise private facility than public facility. This may suggest that quality of health care services in the public health care system has improved.

Insignificant Variables

Only the coefficients for the elderly individuals over the years reveal an insignificant association between the use of private facility compared to public facility. Some of the coefficients of the other variables also showed insignificant association in private health care utilisation, but this is peculiar to one given year or another.

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Table 17.2: Regression results for the Multinomial Logit model [Traditional vs Public]

Year/Variable	1995	1999	2002	2006
	Coefficient Estimates	**Coefficient Estimates**	**Coefficient Estimates**	**Coefficient Estimates**
Dependent Variable				
Base Category: Non utilisation				
Independent Variables				
Adults	0.8030***	1.0530***	1.031***	0.3001
Elderly	0.4493	- 0.2237	0.3941	- 0.1209
Gender	- 0.0791	- 0.387**	- 0.4933*	- 0.6629**
Coloured	- 3.9128***	- 3.533***	- 31.157***	- 33.498***
Indian	0.1352	- 31.522***	- 30.274***	- 33.036***
White	- 0.5339	- 0.6446	1.3271*	- 31.228***
Marital status of head	0.0311	0.2104	- 0.2352	0.1442
No education	- 0.3232	- 0.371	0.3116**	- 0.403
Primary education	- 0.1139	0.790*	0.0567	- 0.475
Secondary education	- 0.3059	0.357	0.2285	- 0.0511
Asset Index	- 0.1721**	- 0.154**	- 0.461***	- 0.294***
Household size	0.0074	- 0.0187	*0.0897**	*0.0106*
Medical insurance	- 0.3272	- 0.1974	1.289***	- 0.3907
Constant	-3.418	- 3.003	- 5.022	- 2.5302

Note: *** = significant at 1% level of significance, ** = significant at 5% and * = significant at 10%. The base categories are children (for age category), females for gender, African/Black for (population group), tertiary education for (education of household head) and rural for location.

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6.2.2.2 Traditional/Spiritual Healer Vs Public Facility

Age

There is a consistent positive trend in the use of traditional/spiritual healer facility by adults as compared to children between 1995 and 2002. Adults are more likely to utilise traditional/spiritual healer facility than public facility over the years when compared to children but for 2006, the coefficient is insignificant. This pattern is expected though it is interesting to note that for the elderly people, there is an inconsistent trend in the use of traditional/spiritual healers compared to public facility. It would have been expected that elderly people would be more likely to utilise traditional/spiritual healer facility than public facility since they would value traditional culture than modern medicine.

Gender

The effect of gender on the use of traditional/spiritual healer facility over public facility showed a negative trend. This trend was consistent from 1995 to 2006; however the 1995 result was insignificant. The negative trend suggests that males are less likely to utilise traditional/spiritual healer than public facility when compared to females. Similar results have been reported by Stekelenburga et al. in 2005. Stekelenburga et al (2005) reported that in Zambia males are also less likely to utilise spiritual healer than females.

Race

The effect of race on the use of traditional/spiritual healer facility over public facility showed a consistent negative trend. The Coloured, Indian and White population group are less likely to use the traditional/spiritual healer than African/Black. This pattern is expected as indicated earlier in Table 8.

Level of Education of Household Head

The effect of level of education of the household head from which a household member resides on traditional/spiritual/healer facility compared to public facility showed that the coefficients of level of education are inconsistent over the ten year period. For individuals who reside where household head has no formal education, 1995 and 2002 results indicated a significant association between the use of traditional/spiritual healer facility and the level of education of household members. The results for 1995 showed a negative association with the use of traditional/spiritual healer facility compared to public facility while the 2002 result show otherwise. Also among individuals whose household heads have primary education, only 1999 result showed a significant association. The 1999 result indicated that individuals who reside in households where household head have primary education are more likely to use traditional/spiritual healer facility than public facility compared to those with tertiary education. Generally the influence of level of education of household members with the use of traditional healer facility compared to public facility did not give a clear pattern. The 2006 result indicated that level of

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education of household head on household members is no longer a determinant of the choice of the use of traditional/spiritual healer facility when compared to public facility.

SES

There is a negative consistent trend in the use of traditional/spiritual healer facility than public facility. The wealthier members of the population are less likely to use a traditional/spiritual healer facility than public facility. This implies that those with lower SES are more likely to utilise of traditional/spiritual healer facility than public facility and this till holds till 2006.

Ownership of medical Insurance

There is an inconsistent trend in the use of traditional/spiritual healer facility than public facility over the 10 year period. There is no significant association between ownership of medical insurance and use of traditional/spiritual healer facility compared to public facility except for 2002. The 2002 result showed that those with medical insurance are more likely to utilise traditional/spiritual healer facility than public facility. This suggests that except for 2002; those with medical insurance are less likely to utilise traditional/spiritual healer facility compared to public facility.

Insignificant Variables

In general over the ten year period, the coefficients for the elderly, those with secondary education, whether household s' head is married or not and the size of the household did not have any significant influence on the use of traditional/spiritual healer facility when compared to the use of public facility. Although most of the coefficients of the other factors are also insignificant for one year or the other, but they suggest an association with use of traditional/spiritual healer facility when compared to public while holding other factors constant.

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6.2.2 Effect of Location on Trends in Health Care Utilisation Pattern

Given that location is an important health care utilisation determinant, the study presents the results of the regression analysis that includes location in the multinomial regression model (seen in Appendix B). The inclusion of rural/urban variable in the model did not change the size and sign of the coefficients for the other variables. So rural/urban has an important influence on health care utilisation pattern which need to be identified. Table 18 below illustrates the impact of location on the choice of health care use. There is a consistent positive significant trend in the use of private facility compared to public facility. Those in urban areas are more likely from 1999 to 2002 to utilise private facility compared to public facility. The pattern is also similar when comparing the use of traditional/spiritual healer facility to public facility.

Table 18: Multinomial regression results with location between 1995 and 2002.

Urban/Rural: Private Vs Public		
Year	Coefficient estimates	P-value
1995	- 0.2224***	0.000
1999	0.2189***	0.007
2002	0.2101***	0.020
Urban/Rural: Traditional/Spiritual healer Vs Public		
1995	0.2259	0.248
1999	0.5425***	0.006
2002	1.2629***	0.008

However for 1995, those in urban areas are less likely to utilise private compared to public facility, while for the same year, those in urban areas are more likely to utilise traditional/spiritual healer facility compared to public facility, though insignificant. This suggests that in 1995, there was a greater preference for the use of public health facilities than in the following years.

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6.2.3 Results of the Binary Response Model

The results of the logit model in Table 19 shows the relationship between potential determinants of health care utilisation and the use or non-use of health care facilities among ill/injured individuals.

The results showed that within the age categories, adults and the elderly are less likely to utilise health care than children based on 1995 data. However this has changed. Between 2002 and 2006 there is a positive association between being an elderly and health care use while the coefficient for adults is no longer significant.

The relationship between gender and health care use is also inconsistent. The result for 2002 showed that males are less likely to utilise health care than females. However, this has changed, as the coefficient for gender is insignificant. This suggests that gender is no longer a barrier to use of health care.

The logit model showed an inconsistent trend in health care use among the Coloureds and the Indian population group compared to African/Blacks over the ten year period. For the White population, the coefficient of health care use for 1995 result is positive. However this has changed. The 2002 and 2006 results showed that the White population group are less likely to utilise health care compared to African/Blacks. This suggests that utilisation of health care is higher among African/Blacks. Also among the Coloureds and the Indians the 2006 results indicated that there is no significant relationship between health care use and being a coloured or Indian population group when compared to African/Blacks. This suggests being a coloured or Indian is not a barrier to heath care use.

The coefficient of the association between health care use and individuals who reside where household head is married is negative for 1995 result but this has changed. The 2002 and 2006 result showed that individuals who reside in households where household head is married are more likely to use health care than those whose household heads are unmarried.

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Table 19: Regression results: Logit model [Utilisation]

Year/Variable	1995	2002	2006
	Coefficient Estimates	**Coefficient Estimates**	**Coefficient Estimates**
Dependent Variable			
Base Category: Non utilisation			
Independent Variables			
Adults	- 0.1698***	- 0.0100	- 0.0668
Elderly	- 0.3658***	0.2574**	0.4869***
Gender	0.0139	0.1340***	0.2482***
Coloured	0.1878**	- 0.5570***	- 0.0556
Indian	- 0.2468**	0.0925	0.4024
White	0.1852**	- 0.9316***	- 0.5466***
Marital status of head	- 0.1458***	0.2269***	0.2118**
No education	0.1697	0.1078	0.0875
Primary education	0.1169	0.0805	0.1013
Secondary education	0.1795**	0.2037	- 0.8008
Asset Index	0.0633***	0.0833***	0.0069
Household size	0.0074	0.0185	0.0199
Medical insurance	0.0976	0.4954***	- 0.9244***
Constant	1.1919	1.0186	2.8084

Note: *** = significant at 1% level of significance, ** = significant at 5% and * = significant at 10%. The base categories are children (for age category), females for gender, African/Black for (population group), tertiary education for (education of household head) and rural for location.

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There is also a consistent positive trend between the use of health care and SES as shown in the 1995 and 2002 results. Those with higher SES are more likely to utilise health care than those with lower SES. However this has changed. The 2006 result showed an insignificant positive association. This may imply that SES is no longer a determinant of health care use; hence SES is not a barrier to health care use among those with lower SES.

Medical insurance showed an inconsistent trend with the use of health care over the ten year period. The 2002 result showed that those with medical insurance are more likely to utilise health care than those without medical insurance but for 2006 result the coefficient has changed.

Insignificant variables

Over the ten year period, the coefficients of individuals who reside where household head has no formal education, primary education and household size reveal an insignificant influence on use and non use of health care. In addition the coefficients for adults, individuals who reside where household head has secondary education and being an Indian showed an insignificant association with health care utilisation for 2002 and 2006 results while holding other variables constant.

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CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

This chapter presents the conclusions gathered from the descriptive statistics, the multinomial regression models and the binary response model to explain the factors influencing the use and choice of health care in South Africa. It also discussed how these factors have changed over the ten year period. In addition, it highlighted the variables that indicated that health care utilisation pattern is in favour of those with higher need for health care. Lastly based on the conclusions, recommendations were proposed on how to further improve on an equitable health care utilisation pattern in South Africa.

7.2 Conclusion

The utilisation of health care in the public facility has increased over the ten year period. An increase in public facility utilisation is expected given that free health care policy (as part of the equity based health care policies) is available within the public facility to ensure access to health care among individuals of higher need. On the other hand, a decrease in the socio-economic conditions such as access to electricity and water can be a possible reason for the increase in public facility utilisation. There is a general consensus that those of lower SES carry a heavier burden of ill-health, hence a higher health care use [(oliver and Mossialos, 2004; Gulliford, 2003; Whitehead, 1992)]. This may imply that some of the equity based policies such as the National Health Plan (1994) has not achieved its objectives. One of the objectives is to ensure that socio-economic conditions do not affect the health care needs of the population.

The racial composition of the population revealed that the African/Blacks are still the most underprivileged group given their lower socio-economic status (SES). The variations in the SES among the population groups have influenced the use and choice of health care. There is a positive association between private health care utilisation and medical insurance cover, higher level of education and racial group. Between 1995 and 2006 private health care use has risen by 21.4% among those with medical insurance,

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13.5% among those with tertiary education, 12.6% among the Whites within the richest quintile and 11.4% among African/blacks in the richest wealth quintile. This suggests that higher SES among the White population and the trend among the African/Blacks presently (2006 result) indicate that the pattern of health care utilisation is still differentiated between the rich and the poor.

The following factors have been identified to have influence on the choice and the use of health care among individuals and households in South Africa over the ten year period. These factors includes: level of education, population group or race, gender household size, SES and ownership of medical insurance. The multinomial regression models showed that the influence of the explanatory variables on the choice of health care was not consistent over the ten year period except for asset index (SES) and household size. In addition the influence of the explanatory variables on use of health care (as shown by the logit model) was not consistent for all the variables.

Level of education still has a significant positive association with the trend in health care utilisation pattern. Those with lower education (such as those with no formal education or primary education) are more likely to use more of public facility and traditional/spiritual healer facility than private facility. Those with higher education are more likely to utilise private facility, although, the choice of an individual or household head to utilise public, private or traditional healer facility depends on their tastes and preferences.

The positive association between higher level of education and health care utilisation implies that education could be a practical tool to improve the health care utilisation pattern of the population. Investing in education according to Grossman (1972), will not only increase the productivity and income of individuals, but it could influence and improve the health seeking behaviour among individuals.

The study also reports that gender differences still has a significant influence on health care utilisation over the ten year period. Males are more likely to utilise private facility but less likely to utilise traditional healer facility than females when compared to public

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facility utilisation. This suggests that the public facility is responding to the needs of females. This should be expected because they are beneficiaries of free health policy. Hence a move towards an equitable health care utilisation pattern is being promoted.

As in earlier studies by Wadee et al (2003) and Makinen et al (2000), this study also found that population group or race still remains an important determinant of health care utilisation. It was found that African/Black are more likely to utilise public and traditional/spiritual healer facility compared to private facility than any other population group. This may suggest that the public facility is responding to the needs of the underprivileged. It is also important to note that the proportion of African/Black within the lowest and richest quintile utilising private health care facility has increased over the ten year period. This may imply that the African/Blacks who have gained higher SES prefer private health care use to public facility utilisation or that access to quality health care for the poor is lower.

Household size has a consistent negative association with the trend in private health care utilisation pattern compared to public facility. Information about utilisation of preventive health care can help to make conclusions on the negative association between household size and health care utilisation pattern. This is because the effectiveness of preventive health care (for example family planning programme) can help to arrive at objective conclusion that smaller family size is necessary to reduce burden associated with health care utilisation.

Household asset index is an important SES and access factor that have remained a significant influence on health care utilisation pattern over the years. The trend in the health care utilisation indicated that a unit increase in the asset of household increases the likelihood of households to utilise private facility while the likelihood of utilising traditional/spiritual healer decreases compared to public facility. However based on the results from the logit model for 2006, household asset index showed no significant association with health care utilisation. This suggests that SES is no longer a determining

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factor for utilisation given the 2006 result. This may then indicate that pattern of utilisation is more equitable.

Similarly medical insurance has also shown to be an important determinant of use and the choice of health care in the population over the years. However this has changed. The 2006 multinomial regression result showed that those with medical insurance are less likely to use private facility than public facility. This implies that those with medical insurance are more likely to use public facility compared to other choices. Based on this result it is difficult to suggest that the pattern of choice of health care is due to improved quality of services in the public sector. In addition medical insurance coverage within the population has reduced by over 60% between 1995 and 2006.

Lastly it was also found that location has a significant influence on health care utilisation over the years. Up till 2002, there still remains a consistent positive trend in the use of private and traditional healer facility among urban residents when compared to public. This means that geographic access no longer influence public facility utilisation among the underserved, thus a more equitable health care utilisation pattern.

The pattern of utilisation among different age groups as shown by the multinomial model and logit model suggest that being an adult or an elderly is no longer a determinant of choice of health care compared to children. It implies that an increasing age does not determine the choice or use of health care provider, rather individuals will utilise health care when there is need.

7.3 Policy Recommendations

- The positive association between increases in the level of education and health care utilisation suggest that education can help improve the health seeking behaviour among individuals. It is recommended that awareness about health programmes be promoted through the media to enhance better awareness of government legislation and programmes. This will encourage positive attitudes among individuals to use public health care services.

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- The finding that higher proportions of African/Blacks are still of lower SES, suggest that they have higher need for public health care services. It is recommended that government should further improve access to health care, so that the underprivileged can be protected.

- The 2006 multinomial regression result showed that those with medical insurance are less likely to use private facility than public facility suggests that the choice to use public facility should be promoted. In order to achieve a higher degree of substitution between the private and public health care sector, it is recommended that the long awaited Social Health Insurance (SHI) be implemented. The SHI can encourage an increase in low cost health insurance coverage among low/medium income groups and promote cross subsidy from the private sector (McIntyre and Gilson, 2002).

- The data presented for the analysis of this study are not sufficient to propose further recommendations that could further explain the influence of age and medical insurance on health care utilisation pattern. Rather age and medical insurance suggest the need for further investigation. Such further studies should include the following:

  a) To gather detailed information that can help assess the determinants of preventive health care within the PHC centres.
  b) To identify the factors influencing efficiency in the public health care system especially information about quality of care.
  c) To assess the determinants of ownership of medical insurance and investigate the reasons for the decline in medical insurance ownership.

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APPENDIX A: Multinomial regression results without location from 1995-2006.

Survey multinomial logistic regression 1995

pweight:	weight	Number of obs	= 14072
Strata:	district	Number of strata	= 358
PSU:	<observations>	Number of PSUs	= 14072
		Population size	= 4.378e+09
		F(26, 13689)	= 76.91
		Prob > F	= 0.0000

Typefacility	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Private						
agecat2	.2391818	.0488439	4.90	0.000	.143441	.3349226
agecat3	.0456453	.08493	0.54	0.591	-.1208292	.2121197
gender	.1089726	.0444452	2.45	0.014	.021854	.1960913
race2	.0397469	.0654766	0.61	0.544	-.0885961	.16809
race3	.7361261	.0898487	8.19	0.000	.5600104	.9122418
race4	.655315	.0734615	8.92	0.000	.5113204	.7993096
head_status	.157751	.0491537	3.21	0.001	.061403	.254099
Head_educ1	-.4162073	.088093	-4.72	0.000	-.5888816	-.243533
Head_educ2	-.4216606	.0801062	-5.26	0.000	-.5786797	-.2646415
Head_educ3	-.2735242	.0674786	-4.05	0.000	-.4057915	-.1412569
assetindex	.2047428	.01822	11.24	0.000	.169029	.2404566
Medaid	-.9292365	.0568104	-16.36	0.000	-1.040593	-.8178804
hhsize	-.0145688	.0097023	-1.50	0.133	-.0335867	.004449
_cons	.7813695	.1469204	5.32	0.000	.4933853	1.069354
Traditional						
agecat2	.8030914	.1881255	4.27	0.000	.4343396	1.171843
agecat3	.4409571	.3156512	1.40	0.162	-.1777626	1.059677
gender	-.0791343	.1600883	-0.49	0.621	-.3929293	.2346608
race2	-3.912829	1.008815	-3.88	0.000	-5.890244	-1.935414
race3	.135283	.4296767	0.31	0.753	-.7069421	.9775081
race4	-.5339662	.4518895	-1.18	0.237	-1.419731	.351799
head_status	.0310774	.1682883	0.18	0.853	-.2987908	.3609455
Head_educ1	.3232872	.3521781	0.92	0.359	-.3670302	1.013605
Head_educ2	-.1139841	.3664714	-0.31	0.756	-.8323182	.6043499
Head_educ3	-.3059863	.3526527	-0.87	0.386	-.9972339	.3852613
assetindex	-.1721642	.0553827	-3.11	0.002	-.2807218	-.0636065
Medaid	-.3272146	.2775984	-1.18	0.239	-.8713456	.2169163
hhsize	.0074098	.0293274	0.25	0.801	-.0500759	.0648955
_cons	-3.418776	.7325773	-4.67	0.000	-4.854727	-1.982824

(Outcome Typefacility==1 is the comparison group)

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Survey multinomial logistic regression 1999

pweight:	WGT4	Number of obs	= 11279
Strata:	<one>	Number of strata	= 1
PSU:	PSUNR	Number of PSUs	= 2711
		Population size	= 4.497e+10
		F(26, 2685)	= 1268.85
		Prob > F	= 0.0000

Typefacility	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Private						
agecat2	.2870019	.0608411	4.72	0.000	.1677022	.4063016
agecat3	.142008	.1060601	1.34	0.181	-.0659588	.3499748
gender	.0000786	.0505119	0.00	0.999	-.0989671	.0991243
race2	-.6680281	.1032064	-6.47	0.000	-.8703993	-.465657
race3	.0728322	.193877	0.38	0.707	-.3073296	.452994
race4	.0572104	.1354431	0.42	0.673	-.2083717	.3227926
head_status	.3067941	.0618545	4.96	0.000	.1855074	.4280809
Head_educ1	-.9148113	.1250477	-7.32	0.000	-1.16001	-.6696128
Head_educ2	-.9341475	.1130861	-8.26	0.000	-1.155891	-.7124038
Head_educ3	-.5386873	.1056597	-5.10	0.000	-.745869	-.3315057
assetindex	.2120179	.0220806	9.60	0.000	.1687214	.2553143
Medaid	1.779393	.0940798	18.91	0.000	1.594918	1.963869
hhsize	-.0221063	.0103259	-2.14	0.032	-.0423538	-.0018589
_cons	-.1466215	.1470757	-1.00	0.319	-.4350133	.1417703
Traditional						
agecat2	1.053018	.2855053	3.69	0.000	.4931874	1.612848
agecat3	-.2237808	.4567533	-0.49	0.624	-1.119401	.6718392
gender	-.3878013	.1781796	-2.18	0.030	-.737183	-.0384196
race2	-3.533327	1.010488	-3.50	0.000	-5.514731	-1.551922
race3	-31.52213	.3313027	-95.15	0.000	-32.17176	-30.8725
race4	-.6446028	.7429941	-0.87	0.386	-2.101495	.8122895
head_status	.2104436	.1846767	1.14	0.255	-.1516777	.572565
Head_educ1	-.3712351	.4715117	-0.79	0.431	-1.295794	.5533238
Head_educ2	-.790435	.4574966	-1.73	0.084	-1.687513	.1066425
Head_educ3	-.3572903	.4334059	-0.82	0.410	-1.20713	.4925491
assetindex	-.1541561	.0781272	-1.97	0.049	-.3073511	-.0009612
Medaid	-.1974051	.461359	-0.43	0.669	-1.102056	.7072459
hhsize	-.0187176	.0223631	-0.84	0.403	-.0625679	.0251328
_cons	-3.002717	.5355017	-5.61	0.000	-4.05275	-1.952685

(Outcome Typefacility==public is the comparison group)

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Survey multinomial logistic regression 2002

pweight:	Person_Wgt	Number of obs	= 9880
Strata:	Stratum	Number of strata	= 18
PSU:	Psu	Number of PSUs	= 2595
		Population size	= 4268851.5
		F(26, 2552)	= 1643.52
		Prob > F	= 0.0000

Typefacility	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Private						
agecat2	.0125466	.0630973	0.20	0.842	-.1111799	.136273
agecat3	.1171751	.1075564	1.09	0.276	-.0937305	.3280808
gender	-.0255815	.0558715	-0.46	0.647	-.135139	.0839761
race2	-.4710777	.1226708	-3.84	0.000	-.7116209	-.2305344
race3	.1478301	.2644144	0.56	0.576	-.3706561	.6663163
race4	.303442	.1834566	1.65	0.098	-.0562953	.6631793
head_status	.3946777	.071814	5.50	0.000	.2538588	.5354967
Head_educ1	-.1122547	.0948424	-1.18	0.237	-.2982296	.0737203
Head_educ2	.1297894	.0948843	1.37	0.171	-.0562679	.3158466
Head_educ3	.9532741	.1732122	5.50	0.000	.613625	1.292923
assetindex	.1726035	.0252472	6.84	0.000	.1230967	.2221103
Medaid	2.223157	.1174484	18.93	0.000	1.992854	2.45346
hhsize	-.0310848	.0157185	-1.98	0.048	-.061907	-.0002625
_cons	-.9581895	.1525707	-6.28	0.000	-1.257363	-.6590158
Traditional						
agecat2	1.031528	.2905912	3.55	0.000	.4617116	1.601344
agecat3	.3941888	.48048	0.82	0.412	-.5479772	1.336355
gender	-.4933429	.2669981	-1.85	0.065	-1.016895	.0302096
race2	-31.15745	.2649342	-117.60	0.000	-31.67696	-30.63795
race3	-30.27421	.4416286	-68.55	0.000	-31.14019	-29.40822
race4	1.327074	.725447	1.83	0.067	-.0954438	2.749592
head_status	-.2351847	.3661248	-0.64	0.521	-.9531132	.4827439
Head_educ1	-.7078131	.3116423	-2.27	0.023	-1.318908	-.0967185
Head_educ2	.0567826	.5983494	0.09	0.924	-1.116512	1.230077
Head_educ3	.2285858	.868131	0.26	0.792	-1.473719	1.930891
assetindex	-.4610239	.0853987	-5.40	0.000	-.6284808	-.2935669
Medaid	1.289961	.4543026	2.84	0.005	.3991257	2.180796
hhsize	.0897503	.05401	1.66	0.097	-.0161571	.1956577
_cons	-4.636516	.4336355	-10.69	0.000	-5.486825	-3.786206

(Outcome Typefacility==Public is the comparison group)

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Survey multinomial logistic regression 2006

```
pweight:  Pers_wgt                                Number of obs    =     10852
Strata:   DC                                      Number of strata =        53
PSU:      PSU                                     Number of PSUs   =      1385
                                                  Population size  = 4924875.4
                                                  F(  26,   1307)  =   2039.34
                                                  Prob > F         =    0.0000

------------------------------------------------------------------------------
Typefacility |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
Private      |
     agecat2 |   .0047699   .0770757     0.06   0.951    -.1464331    .1559729
     agecat3 |   .1499508   .1152016     1.30   0.193    -.0760456    .3759472
      gender |   .1169718   .0582417     2.01   0.045     .0027162    .2312273
       race2 |  -.4721679   .1522903    -3.10   0.002    -.7709229   -.1734129
       race3 |   .1321485   .4403409     0.30   0.764    -.7316889    .9959858
       race4 |   .7637299   .2429355     3.14   0.002      .287152    1.240308
 head_status |   .5338818   .0853954     6.25   0.000     .3663577    .7014058
  Head_educ1 |  -.1150971   .1078826    -1.07   0.286    -.3267355    .0965412
  Head_educ2 |   .1732443   .1052051     1.65   0.100    -.0331414    .3796301
  Head_educ3 |   .7361684   .2216717     3.32   0.001     .3013048    1.171032
  assetindex |   .1452874   .0278333     5.22   0.000     .0906856    .1998893
      Medaid |  -2.366972   .1375826   -17.20   0.000    -2.636874    -2.09707
      hhsize |  -.0746882   .0152414    -4.90   0.000     -.104588   -.0447885
       _cons |   3.588485   .2991372    12.00   0.000     3.001654    4.175316
-------------+----------------------------------------------------------------
Traditional  |
     agecat2 |   .3001179   .3547806     0.85   0.398    -.3958716    .9961075
     agecat3 |  -.1209183   .5513169    -0.22   0.826    -1.202462    .9606257
      gender |  -.6629765   .2930169    -2.26   0.024    -1.237802   -.0881516
       race2 |  -33.49854   .2855334  -117.32   0.000    -34.05869    -32.9384
       race3 |  -33.03637   .4106636   -80.45   0.000    -33.84199   -32.23076
       race4 |   -32.2491   .4453654   -72.41   0.000    -33.12279    -31.3754
 head_status |   .1442994   .4103587     0.35   0.725    -.6607204    .9493192
  Head_educ1 |  -.4026104   .4840872    -0.83   0.406    -1.352267    .5470459
  Head_educ2 |  -.4759562   .3608964    -1.32   0.187    -1.183943     .232031
  Head_educ3 |  -.0510936   .9768256    -0.05   0.958    -1.967378    1.865191
  assetindex |  -.2954381   .1034737    -2.86   0.004    -.4984272   -.0924489
      Medaid |  -.3907186   .5568666    -0.70   0.483     -1.48315    .7017124
      hhsize |   .0106016   .0546032     0.19   0.846    -.0965159    .1177192
       _cons |  -2.530253   1.100685    -2.30   0.022    -4.689518   -.3709884
------------------------------------------------------------------------------
(Outcome Typefacility==Public is the comparison group)
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APPENDIX B: Multinomial regression results with location from 1995-2002.

Survey multinomial logistic regression 1995

```
pweight:  weight                                  Number of obs    =     14072
Strata:   district                                Number of strata =       358
PSU:      <observations>                          Number of PSUs   =     14072
                                                  Population size  = 4.378e+09
                                                  F(  28,  13687)  =     71.87
                                                  Prob > F         =    0.0000
------------------------------------------------------------------------------
Typefacility |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
Private      |
     agecat2 |   .2299459    .048849     4.71   0.000     .1341953    .3256966
     agecat3 |   .0433487   .0847803     0.51   0.609    -.1228322    .2095296
      gender |   .1129764   .0444245     2.54   0.011     .0258984    .2000544
       race2 |   .0068596   .0660583     0.10   0.917    -.1226237    .1363429
       race3 |   .7060972   .0900383     7.84   0.000     .5296098    .8825846
       race4 |   .6547797    .073423     8.92   0.000     .5108604    .7986989
 head_status |   .1651732   .0491488     3.36   0.001     .0688348    .2615116
  Head_educ1 |  -.3988315   .0883362    -4.51   0.000    -.5719826   -.2256805
  Head_educ2 |  -.4221067   .0802062    -5.26   0.000    -.5793219   -.2648916
  Head_educ3 |  -.2876716   .0676916    -4.25   0.000    -.4203563   -.1549868
  assetindex |   .1675597   .0204799     8.18   0.000     .1274163    .2077031
      hhsize |  -.0141854    .009697    -1.46   0.144    -.0331929    .0048221
      Medaid |  -.9155927   .0567891   -16.12   0.000    -1.026907   -.8042782
    Location |  -.2224108   .0568222    -3.91   0.000    -.3337901   -.1110316
       _cons |   1.076994    .165512     6.51   0.000     .7525677     1.40142
-------------+----------------------------------------------------------------
Traditional  |
     agecat2 |   .8162172   .1870298     4.36   0.000     .4496132    1.182821
     agecat3 |   .4493855   .3155737     1.42   0.154    -.1691821    1.067953
      gender |  -.0852156   .1594806    -0.53   0.593    -.3978195    .2273882
       race2 |  -3.866317   1.009809    -3.83   0.000    -5.845681   -1.886952
       race3 |   .1736882   .4318968     0.40   0.688    -.6728888    1.020265
       race4 |   -.529197   .4541129    -1.17   0.244     -1.41932    .3609264
 head_status |   .0223003   .1680256     0.13   0.894     -.307053    .3516535
  Head_educ1 |   .3168236   .3513455     0.90   0.367    -.3718617    1.005509
  Head_educ2 |  -.1032667   .3651714    -0.28   0.777    -.8190527    .6125194
  Head_educ3 |   -.282553   .3512606    -0.80   0.421    -.9710719    .4059659
  assetindex |  -.1354042   .0660255    -2.05   0.040    -.2648232   -.0059852
      hhsize |    .005847   .0293155     0.20   0.842    -.0516153    .0633094
      Medaid |   -.347947   .2764551    -1.26   0.208    -.8898367    .1939428
    Location |   .2259794   .1955875     1.16   0.248    -.1573989    .6093578
       _cons |  -3.717074   .8082041    -4.60   0.000    -5.301265   -2.132883
------------------------------------------------------------------------------
(Outcome Typefacility==1 is the comparison group)
```

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Survey multinomial logistic regression 1999

```
pweight:  WGT4                                    Number of obs    =     11279
Strata:   <one>                                   Number of strata =         1
PSU:      PSUNR                                   Number of PSUs   =      2711
                                                  Population size  = 4.497e+10
                                                  F(  28,   2683)  =   1204.50
                                                  Prob > F         =    0.0000
```

Typefacility	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Private						
agecat2	.2925703	.0610305	4.79	0.000	.1728993	.4122413
agecat3	.1313074	.1059808	1.24	0.215	-.076504	.3391188
gender	-.0014771	.0504774	-0.03	0.977	-.1004551	.097501
race2	-.6460894	.1030062	-6.27	0.000	-.8480681	-.4441107
race3	.0970056	.1948854	0.50	0.619	-.2851333	.4791446
race4	.0493995	.1353546	0.36	0.715	-.2160091	.3148081
head_status	.2893133	.0624639	4.63	0.000	.1668317	.4117949
Head_educ1	-.9434727	.126658	-7.45	0.000	-1.191829	-.6951167
Head_educ2	-.942837	.1138561	-8.28	0.000	-1.16609	-.7195835
Head_educ3	-.532829	.1058248	-5.04	0.000	-.7403346	-.3253234
assetindex	.2379704	.0242716	9.80	0.000	.1903776	.2855632
hhsize	-.0241124	.0102425	-2.35	0.019	-.0441962	-.0040286
Medaid	1.783792	.0942748	18.92	0.000	1.598935	1.96865
Location	.2189161	.0811649	2.70	0.007	.0597647	.3780676
_cons	-.4367967	.1799627	-2.43	0.015	-.7896747	-.0839186
Traditional						
agecat2	1.074542	.2854245	3.76	0.000	.5148707	1.634214
agecat3	-.2557432	.4558393	-0.56	0.575	-1.149571	.6380847
gender	-.3978844	.1791948	-2.22	0.026	-.7492566	-.0465122
race2	-3.465445	1.012	-3.42	0.001	-5.449814	-1.481075
race3	-31.42762	.3478742	-90.34	0.000	-32.10974	-30.74549
race4	-.6439813	.7512415	-0.86	0.391	-2.117045	.8290828
head_status	.1606027	.1838165	0.87	0.382	-.1998321	.5210374
Head_educ1	-.447168	.4705123	-0.95	0.342	-1.369767	.4754313
Head_educ2	-.8159605	.4575119	-1.78	0.075	-1.713068	.081147
Head_educ3	-.3498421	.4354286	-0.80	0.422	-1.203648	.5039636
assetindex	-.0956118	.0809442	-1.18	0.238	-.2543304	.0631067
hhsize	-.0267102	.0227969	-1.17	0.241	-.0714112	.0179908
Medaid	-.1801855	.4633189	-0.39	0.697	-1.08868	.7283086
Location	.5425909	.1981759	2.74	0.006	.1539997	.931182
_cons	-3.714712	.6204605	-5.99	0.000	-4.931335	-2.498088

(Outcome Typefacility==public is the comparison group)

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Survey multinomial logistic regression 2002

```
pweight:  Person_Wgt                              Number of obs    =      8901
Strata:   Stratum                                 Number of strata =        16
PSU:      Psu                                     Number of PSUs   =      2303
                                                  Population size  = 3887778.3
                                                  F(  28,   2260)  =   1619.44
                                                  Prob > F         =    0.0000
```

Typefacility	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
Private						
agecat2	-.0344746	.0661963	-0.52	0.603	-.1642856	.0953365
agecat3	.0706568	.1121535	0.63	0.529	-.1492763	.29059
gender	-.0105873	.0584236	-0.18	0.856	-.1251562	.1039815
race2	-.4958859	.124967	-3.97	0.000	-.7409465	-.2508253
race3	.1220228	.267277	0.46	0.648	-.4021078	.6461535
race4	.275942	.1876198	1.47	0.141	-.0919809	.6438648
head_status	.4222078	.0758988	5.56	0.000	.2733701	.5710455
Head_educ1	-.1082374	.10217	-1.06	0.290	-.3085931	.0921182
Head_educ2	.1630693	.1030757	1.58	0.114	-.0390624	.3652009
Head_educ3	.9830921	.1890828	5.20	0.000	.6123005	1.353884
assetindex	.185444	.028053	6.61	0.000	.130432	.240456
hhsize	-.0326191	.0162842	-2.00	0.045	-.0645526	-.0006857
Medaid	2.242072	.1272482	17.62	0.000	1.992538	2.491606
Location	.2101759	.0899568	2.34	0.020	.0337705	.3865814
_cons	-1.211466	.206859	-5.86	0.000	-1.617116	-.8058148
Traditional						
agecat2	.951411	.3087784	3.08	0.002	.3458961	1.556926
agecat3	.2873004	.5192367	0.55	0.580	-.7309237	1.305524
gender	-.3528781	.3010431	-1.17	0.241	-.943224	.2374679
race2	-32.87053	.2411264	-136.32	0.000	-33.34338	-32.39768
race3	-32.06559	.4494133	-71.35	0.000	-32.94689	-31.18429
race4	1.387126	.7404768	1.87	0.061	-.0649506	2.839202
head_status	-.409496	.4038042	-1.01	0.311	-1.201357	.3823647
Head_educ1	-.6227705	.3491308	-1.78	0.075	-1.307417	.0618756
Head_educ2	.2856553	.690447	0.41	0.679	-1.068313	1.639623
Head_educ3	.4493694	.8870409	0.51	0.612	-1.290119	2.188858
assetindex	-.3305241	.1362987	-2.42	0.015	-.5978061	-.063242
hhsize	.069506	.0616981	1.13	0.260	-.0514841	.1904961
Medaid	1.467069	.4710002	3.11	0.002	.5434367	2.390701
Location	1.262988	.4794727	2.63	0.008	.3227412	2.203235
_cons	-6.660787	.7750356	-8.59	0.000	-8.180633	-5.140941

(Outcome Typefacility==Public is the comparison group)

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APPENDIX C: Binary Response Model Results from 1995 – 2006.

Survey logistic regression 1995

```
pweight:  weight                                  Number of obs    =     12671
Strata:   district                                Number of strata =       358
PSU:      <observations>                          Number of PSUs   =     12671
                                                  Population size  = 3.958e+09
                                                  F(  13,  12301)  =      4.78
                                                  Prob > F         =    0.0000

------------------------------------------------------------------------------
 ill_consult |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     agecat2 |  -.1698459   .0561786    -3.02   0.003    -.2799648    -.059727
     agecat3 |  -.3658206   .0938136    -3.90   0.000    -.5497099   -.1819313
      gender |   .0139613   .0510959     0.27   0.785    -.0861948    .1141173
       race2 |   .1878302   .0817601     2.30   0.022     .0275676    .3480928
       race3 |  -.2468463   .1071143    -2.30   0.021    -.4568071   -.0368855
       race4 |   .1852739   .0889761     2.08   0.037     .0108667     .359681
 head_status |  -.1458612   .0566188    -2.58   0.010     -.256843   -.0348794
  Head_educ1 |   .1697745   .1057176     1.61   0.108    -.0374485    .3769975
  Head_educ2 |   .1169793   .0967062     1.21   0.226      -.07258    .3065386
  Head_educ3 |   .1795353   .0817772     2.20   0.028     .0192391    .3398314
  assetindex |    .063393   .0209587     3.02   0.002     .0223108    .1044753
      hhsize |   .0074779   .0104782     0.71   0.475     -.013061    .0280168
      Medaid |   .0976015   .0722937     1.35   0.177    -.0441055    .2393086
       _cons |   1.191905   .1762917     6.76   0.000     .8463455    1.537464
------------------------------------------------------------------------------
```

Survey logistic regression 2002

```
pweight:  Person_Wgt                              Number of obs    =     12150
Strata:   Stratum                                 Number of strata =        18
PSU:      Psu                                     Number of PSUs   =      2711
                                                  Population size  = 5244541.7
                                                  F(  13,   2681)  =      7.13
                                                  Prob > F         =    0.0000

------------------------------------------------------------------------------
  ill_consult|      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     agecat2 |  -.0100749   .0669684    -0.15   0.880    -.1413896    .1212397
     agecat3 |   .2574815   .1105438     2.33   0.020     .0407222    .4742408
      gender |   .1340406   .0536815     2.50   0.013     .0287795    .2393018
       race2 |   -.557026   .1381234    -4.03   0.000    -.8278646   -.2861875
       race3 |   .0925779   .2954639     0.31   0.754     -.486781    .6719368
       race4 |  -.9316864   .1745301    -5.34   0.000    -1.273913     -.58946
 head_status |   .2269531   .0707741     3.21   0.001     .0881761    .3657301
  Head_educ1 |   .1078888   .0968341     1.11   0.265     -.081988    .2977656
  Head_educ2 |   .0805823   .1026926     0.78   0.433     -.120782    .2819467
  Head_educ3 |   .2037202   .1970321     1.03   0.301    -.1826292    .5900696
  assetindex |   .0833246   .0259037     3.22   0.001     .0325314    .1341177
      hhsize |    .018586   .0130322     1.43   0.154     -.006968    .0441401
      Medaid |   .4954656   .1326245     3.74   0.000     .2354096    .7555217
       _cons |   1.018671   .1465777     6.95   0.000     .7312551    1.306088
------------------------------------------------------------------------------
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Survey logistic regression 2006

```
pweight:  Pers_wgt                                Number of obs    =     12962
Strata:   DC                                      Number of strata =        53
PSU:      PSU                                     Number of PSUs   =      1408
                                                  Population size  = 5880289.8
                                                  F(  13,   1343)  =      6.45
                                                  Prob > F         =    0.0000

------------------------------------------------------------------------------
 ill_consult      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     agecat2 |  -.0668689   .0857061    -0.78   0.435        -.235    .1012622
     agecat3 |   .4869184     .13041     3.73   0.000     .2310911    .7427457
      gender |   .2482854   .0649151     3.82   0.000     .1209404    .3756304
       race2 |  -.0556169   .2031447    -0.27   0.784    -.4541292    .3428954
       race3 |   .4024492   .4131276     0.97   0.330    -.4079899    1.212888
       race4 |  -.5466251   .2201294    -2.48   0.013    -.9784565   -.1147937
 head_status |   .2118905   .0940399     2.25   0.024     .0274108    .3963702
  Head_educ1 |   .0875353   .1213361     0.72   0.471    -.1504917    .3255623
  Head_educ2 |   .1013337   .1243094     0.82   0.415    -.1425262    .3451935
  Head_educ3 |  -.0800802   .2343011    -0.34   0.733    -.5397124     .379552
  assetindex |   .0069554   .0316325     0.22   0.826    -.0550987    .0690094
      hhsize |   .0199681   .0205503     0.97   0.331    -.0203457     .060282
      Medaid |  -.9249954   .1500728    -6.16   0.000    -1.219396   -.6305951
       _cons |   2.804267   .3463253     8.10   0.000     2.124875    3.483659
------------------------------------------------------------------------------
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