

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

Socioeconomic inequalities in Zambia's public health care delivery system

Mini-dissertation for the degree of Master of Public Health (MPH) in Health Economics at the University of Cape Town

Student: Jane Phiri

Student number: PHRJAN002

Supervisor: Dr. John Ataguba*

* Health Economics Unit, University of Cape Town, Cape Town South Africa

Section 0: Preamble

Dedication

I dedicate this work to my family and friends, and also to God for giving me the opportunity.

University of Cape Town

Thesis abstract

Equity in the use of health care has become an important policy goal in many countries, both developed and developing. This goal of equity has continued to receive increased attention because of a growing realization of its importance in promoting good health and consequently promoting economic growth. It is generally accepted that for effective policy formulation to subsist, evidence regarding inequalities in a health system should be present. However, a review of literature reveals that little is known about the extent to which equity in health care utilization holds in Sub Saharan Africa (SSA).

Despite the general agreement over the equity goal, there have been a lot of disputes among researchers and policy makers on what equity in health care is and how this is different from equality. In this thesis, equality is considered as the absence of differences in utilization among individuals of different socioeconomic status while equity is taken to mean that individuals in equal need of health care should use the same amount of care, irrespective of their socioeconomic status. Using the above definitions, this thesis, examines equity/inequality in the utilization of public health care in Zambia. Concentration curves, concentration indices and horizontal equity indices were used for this purpose. This thesis focuses specifically on public health care that is subsidized by the Government.

It is anticipated that the findings of this thesis will broaden the knowledge base on health care utilization inequities in Africa. Additionally, it will also provide better understanding of the effectiveness of the policy measure (i.e. the health sector reforms) put in place over the last two decades, whose aim was to promote equality in access to and utilization of health care services.

The results indicate that there is a pro-rich distribution (though insignificant at conventional levels) in the use of all public health care facilities combined. When a division by different levels of facilities is made, primary facilities (health posts and clinics) both reveal pro-poor inequalities and inequities. However, significant pro-rich inequalities for hospital use are found and when adjusted for need, a significant pro-poor distribution is maintained. These findings show that progress in terms of promoting equity in health care utilization may have been realized particularly for primary facilities. However, this is not so for hospital use. These findings could possibly be as a result of the removal of user fees at all primary

facilities. Additionally the lack of physical accessibility constraints to these primary health facilities encourages the poor to seek care. However, further research is necessary to determine the actual factors behind this revealed distribution.

Acknowledgements

I wish to thank the SHIELD project for funding my studies and for procuring the secondary survey data i.e. the Zambia Living Conditions and Monitoring Survey from the Central Statistical Office in Zambia and therefore making this thesis possible. May I also take this opportunity to acknowledge and thank the Health Economics Unit at the University of Cape Town, and to Dr. Ayako Honda in particular for the academic guidance rendered during my studies. I further wish to thank Brendan Kwesiga for reviewing my work. Last but not the least, special acknowledgements go Dr. John Ataguba for the dedicated supervision and guidance at every stage of the thesis; it would have been impossible without his relentless support.

University of Cape Town

Table of Contents

Section 0: Preamble	2
Dedication	2
Thesis abstract.....	3
Acknowledgements.....	5
Table of Contents.	6
Part A: Research Protocol	8
Introduction.....	9
Problem statement.....	10
Study Rationale.....	12
Research objectives.....	13
Literature review	13
Methods	25
Figure 1: concentration curve for health care utilization	28
Research ethics	31
Budget.....	32
Table1: study (research) budget.....	32
References.....	33
Appendix A: Link between health care utilization and health outcomes.	41
Part B: Literature Review	42
Theoretical review of the concepts equality and equity in health care	43
Table 1: Link between theories of distributive justice and definitions of equity in health care.....	49
Empirical review	61
Table 2: Summary of findings from developed countries	63
Table 3: Summary of findings from developing countries	72
Discussion of Empirical findings.....	76
References.....	79
Part C: Journal Manuscript	86
Abstract.....	87
Introduction.....	88
Methods	90

Figure 1: concentration curve for health care utilization	93
Results.....	96
Table 1: Distribution of need variables and facility use stratified by socioeconomic quintiles.....	96
Table 2: Socioeconomic related inequality and inequity in public health care utilization ..	97
Discussion.....	100
References.....	104
Section D: Policy Brief	108
Table1: summary of who uses more health care relative to need	111
Section E: Appendices	114
Appendix 1: Plagiarism Declaration.....	115
Appendix 2: Human Research ethics approval.....	116
Appendix 3: Journal manuscript instructions	117
Appendix 4: Detailed Description of the Living Conditions Monitoring survey.....	127
Appendix 5: Living Conditions and Monitoring Survey (LCMS) Questionnaire.....	132

Part A: Research Protocol

University of Cape Town

Introduction

Internationally, evidence shows that the wealthy and the more educated report better health than their poorer, less educated counterparts (Cutler et al. 2008, Marmot et al. 1997, Macintyre 1997, Schneider et al. 2002, Szwarcwald et al. 2010). This positive association between better socioeconomic status and health is commonly referred to as the socioeconomic gradient. This has prompted many countries, as part of their health systems performance assessments, to pay increased attention to matters of socioeconomic equality and equity in health and health care use (Foster 1996, Acheson 2000). Accordingly, equity in health care utilization is generally among the basic principles of most health systems and is embedded in the health policies of most countries (World Health Organization 2004).

Equality in health care use in a given population refers to the lack of differences, disparities or variations in health care use among different groups within that population (Kawachi et al. 2002, Venkatapuram et al. 2010, International Society for Equity in Health 2001). On the other hand, equity in health care utilization entails the use of health care services in line with “need” for it (International Society for Equity in Health 2001). Ideally, individuals with equal health need should have equal use of health care services – the principle of horizontal equity.

In Sub-Saharan Africa, like other parts of the world, inequalities in health care utilization are now an important area of focus due to the well-known association between health and economic development (Strauss and Thomas 1998, Kalua et al. 2009). Despite the explicit focus of governments to pursue pro-poor health policies, there is growing evidence pointing towards the extensiveness of inequalities in health care use as well as the existence of the inverse care law (Gwatkin 2001). This phenomenon termed “inverse care law” suggests that individuals with the greatest need for health care often take delivery of the least sufficient health care (Hart 1971). This situation will hinder the attainment of the much-desired Millennium Development Goals if not adequately addressed. In Zambia, reducing inequalities in health care utilization has been identified as one of the major health targets in line with the newfound commitment by government to promote the health of the poor (Hjortsberg and Mwikisa 2002). For instance, embedded in its Vision 2030, the government through the Ministry of Health (MoH) has acknowledged the right to equality in access to and utilization of good quality health care for all Zambians by 2030 (Ministry of Finance and National Planning 2010).

Problem statement

Evidence reveals that the poor were the most hard-hit by the adverse effects of the introduction of user fees and the reduction in public expenditure on health and education through the Structural Adjustment Programs (SAPs) (Sitali 2007, Muzyamba and Masabe 1998, Sehamani 2003). SAPs were introduced in Zambia in the early 1990's as part of the International Monetary fund (IMF's) recommendation to developing countries. The poor sections of society were pushed deeper into poverty, were made more vulnerable to hunger and disease and there were clear signs of socioeconomic inequalities in health care utilization and consequently health status (Muzyamba and Masabe 1998, University of Zambia Department of Economics, Ministry of Health, TARSC 2011). Therefore, in 1993, the Zambian government embarked on pro-poor health policies and initiatives to promote equity and efficiency in health service delivery so as to improve the population's health status (Ministry of Health 2006). These initiatives were aimed at reducing the gaps that existed between population groups with respect to a number of health indicators. The health system specifically aimed at increasing health service utilization rates especially among the poor, improving health outcomes, responding to the people's needs whilst at the same time guaranteeing financial risk protection (Ministry of Health 2006).

The policy interventions that were implemented to this effect included among others, the removal of financial barriers (Masiye et al. 2008). In order to ensure that utilization of good quality health care was distributed on the basis of need and not on the basis of ability to pay hence promoting equity, the entire health system was decentralized in 1995 (Cheelo et al. 2010). This decentralization was later followed by the abolition of user fees at the point of service in 2006 at all rural based primary health care facilities and this was later rolled out to other non-rural primary facilities (Cheelo et al. 2010, University of Zambia Department of Economics, Ministry of Health, TARSC 2011).

Over the past years, since the decentralization, the general performance of Zambia's health care system improved. These improvements have been observed through simple health care indicators like outpatient attendance, coverage of fully immunized under-five children and antenatal coverage (Ministry of Health 2006, Ministry of Finance and National Planning 2005). User fee removal also achieved the goal of increased utilization of health care services especially at primary health facilities (Masiye et al. 2008, Blas and Limbambala 2001).

However, in spite of these improvements, Zambia continues to face numerous public health challenges (Zambia Demographic and Health Survey Report 2007, Ministry of Health 2010, Ministry of Health 2008). The morbidity and mortality level are high due to the high burden of disease such as Malaria, Tuberculosis and HIV/AIDS, which are reinforced by the escalating poverty levels as well as weak macroeconomic position (Ministry of Health 2010). Additionally, the deficiency of adequate human and financial resources constrains health care delivery (Ministry of Health 2006, Ministry of Finance and National Planning 2005). Socioeconomic disparities in numerous health performance indicators have persisted. For example, comparisons in early childhood mortality and maternal mortality across socioeconomic groups reveal that the poor are the most afflicted (University of Zambia Department of Economics, Ministry of Health, TARSC 2011). Also, it has been shown that stunted growth in children is more prevalent in poorer groups (Almqvist 2010). The socioeconomic disparities in health indicators in Zambia indeed are in conformity to the assumed socioeconomic gradient (i.e. lower socioeconomic status corresponding to lower health status) that is said to be present in developing countries (Cutler et al. 2008).

Similarly, despite an increase in utilization of health care services, Survey's conducted over the years still show that barriers in access to and utilization of essential health services has continued to exist (University of Zambia Department of Economics, Ministry of Health, and TARSC 2011). Further, evidence shows that these barriers are relatively higher for the poor especially those who dwell in rural areas who normally cannot meet the costs involved in seeking care and have to travel longer distances to health facilities (University of Zambia Department of Economics, Ministry of Health, TARSC 2011). The inability of the poor to access health care service may possibly deter them from utilizing needed health care services which is likely to be detrimental on their part given their inferior standing in terms of performance indicators (University of Zambia Department of Economics, Ministry of Health and TARSC 2011).

The poor health and health care indicators among the poorer groups in Zambia indicates a possible higher need for health care among them. Further still, it has previously been shown that these groups face greater barriers in access to and utilization of crucial health care services. It is therefore necessary to check if these inequalities in health care utilization still persist.

Study Rationale

Inequities in health care utilization are not only a concern to society in itself (i.e. social justice concern). They can also perpetuate the health-poverty trap that can hinder economic growth (Strauss and Thomas 1998, Sala-i-Martin 2005). The health poverty trap is a situation where ill health conditions and poverty reinforce each other, therefore making it difficult for the poor to break out of poverty (Sala-i-Martin 2005). Health care is considered to serve important ends in the lives of individuals. For one, health care use serves (i.e. enhances/preserves) individuals' health (Culyer 2001, Tobin 1970) [for more details, see Appendix A]. Therefore, inequities have enormous potential to cause socioeconomic inequalities in health status (Sala-i-Martin 2005). Therefore, a more equitable health care distribution is essential and ideal if progress in the overall population's health in the country is to be made and consequently economic growth. It is generally accepted that a major step in transition towards equity, equity in health care utilization inclusive; begins with the identification and measurement of the extent of the inequity present (Patyчук and Seskar-Hencic 2009). Furthermore, the Ministry of Health in Zambia recognizes that in order to accomplish positive health outcomes, the use of information in decision making i.e. evidence based decision making is important (Ministry of Health 2008). It is for this reason that knowledge concerning the extent of inequalities is of prime relevance to policy makers if they are to come up with meaningful national policies that could successfully reduce the disparity gap and therefore, enhance general population health. Earlier studies measuring health care utilization in Zambia are very few and these studies have revealed that utilization is to the benefit of the well off (Bonfrer et al. 2012, Makinen et al. 2000). Though informative, these studies did not disaggregate by facility level and only one study adjusted for differences in 'need' for care (Bonfrer et al. 2012). In addition, these studies base their analyses on survey data, which was collected shortly after the pro-poor reforms (i.e. user fee removal) were put in place. However, more reforms such as the building of more health facilities has subsequently occurred (University of Zambia Department of Economics, Ministry of Health, TARSC 2011). This study provides more recent evidence, disaggregates the analysis by facility type thereby, showing a clearer picture of the presence and extent inequity for the different facility levels.

Based on this, it is envisioned that this study will provide essential knowledge about the extent of inequalities in health care utilization thereby, providing information to policy makers.

Research objectives

The study Measures socioeconomic related inequality in public health care utilization in Zambia and specifically:

- Assesses the distribution of health care utilization by different socioeconomic groups for public primary and secondary facilities in 2010.
- Compares the distribution of health care utilization to perceived need for care.

Literature review

A. Theoretical review

This section gives an overview of the concept equality in health care utilization, explores theories of equity (fairness and justice), which in turn is followed by an exploration of various conceptualizations of equity in health care utilization, and need for health care. After all this, a final conceptualization of the definition of equity in health care that is adopted in this study is given.

What is equality in health care utilization?

In the literature, there is a general consensus over the meaning of equality. It has been largely defined as the state of being equal which entails having equal rights, privileges or ability etc. (Whitehead 1992, Gakidou et al. 2000). For this study therefore, equality in health care utilization is defined as disparities in utilization of health care services among individuals of different socioeconomic standing (International Society for Equity in Health 2001).

A pro-poor (pro-rich) inequality in health care utilization would therefore imply that groups of lower socioeconomic status (higher socioeconomic status) take greater delivery of health care services (Wagstaff and Van Doorslaer 2000).

What is Equity?

The concept of equity can be defined in several ways. One commonality however is that equity is an ethical principle that constitutes justice or fairness. What is judged to be fair and just is where divergence begins. Different philosophical perspectives hold different interpretations for it and these interpretations often conflict with one another (Olsen 1997, Culyer and Wagstaff 1993). In this section, equity is explored from the following philosophical standpoints: Rawl's theory of distributive justice, utilitarianism, libertarianism, egalitarianism and Sen's theory of equality.

(a) Rawls' theory of distributive justice

Under Rawls' theory, fairness and justice occur when each and every individual has an equal right to basic liberties. This philosophical standpoint is based on the assumption that, all individuals are self-interested, equal and behave rationally (Rawls 1999). Rawls' holds that, under the 'veil of ignorance' (where nobody knows their standing in society) individuals will choose to follow an idea where 'social and economic inequalities are to the benefit of the least advantaged' (Morris et al. 2007). This principle is referred to as the 'difference principle' or the 'Maximin principle' (Burt 2010). Likewise, individuals are also said to choose a scenario where inequalities are to be attached to conditions where there is 'equality of opportunity' (Rawls 1999).

(b) Sen's theory of equality

This philosophical view requires equality in terms of individuals' capabilities to attain attributes that constitute their well-being. These attributes are referred to as 'functionings and include among other's basic things such as suitable nutrition and being in good health to more intricate things such as pleasure, self-respect and community participation (Sen 1992).

(c) Egalitarianism

The two above mentioned theories namely, Rawls theory of distributive justice and Sen's theory are considered milder forms of egalitarianism (Olsen 1997, Smith 2009). However, for justice and fairness to prevail, strict egalitarianism requires a perfectly equal distribution of the distribuendum (the entity to be shared) (Abasolo and Tsuchiya 2004).

(d) Libertarianism

This theory highlights individuals' rights, and it puts forward that each individual is entitled to the goods that they hold (Mannesh 2005). Whatsoever distribution outcomes from the free exchange of a particular good/service is therefore said to be fair and just according to this philosophical standpoint. Being against government intervention, the only government intervention that is valid here involves the financing of institutions whose aim is to promote free exchange. This philosophical view is the main equity basis for private health care (Mannesh 2005).

(e) Utilitarianism

Dating as far back as 19th century and first proposed by John Stuart Mills and Jeremy Bentham, this philosophical standpoint bases the appropriateness/fairness of act by its influence on total utility (Zalta et al. 2010). Utility is a representation of an individuals' level of satisfaction, benefit or happiness they derive from using a given item (Glied and Smith 2011). Therefore, total utility is the sum of satisfaction or benefit of all individuals' gains from consuming a specific amount of good or service in an economy (Glied and Smith 2011). A fair/ just distribution therefore, is one that produces the greatest happiness/benefit for society and where institutions are organized in a way that creates the highest net benefit (satisfaction) for all individuals (Morris et al. 2007).

Equity in health care

While there is considerable agreement over the importance of the goal of equity in health care, this is not so for its definition and how to assess it (Culyer and Wagstaff 1993, Braveman and Gruskin 2003). Given the varying philosophies of equity- as outlined above, it is not surprising to have different definitions of equity in health care. For example, Aday and Andersen (1974) note, "equity in health care entails that, allocation and access to health care is determined by health care needs. Whitehead (1992) defines equity in health care as 'equal access to available care for equal need', 'equal utilization for equal need' and as 'equal quality of care for all'. Additionally, Culyer and Wagstaff (1993) offer four definitions, namely: 'equal health care for people with equal needs', 'equal access to health care, or removing inequalities in health outcomes and distribution according to need'. We therefore compare the various alternative conceptualizations of equity in health care whilst linking the different definitions back to their underlying philosophical perspectives.

(a) Equal expenditure per capita

This definition underlies most countries' budget allocation formulae. It involves distributing a specified amount of resources to specific geographic locations depending on the number of people in the area (Mooney 1983, Le Grand 1982). This definition has been criticized for not taking into account the differences in need. It therefore does not necessarily institute fairness and is hence not adopted for this study (Culyer and Wagstaff 1993, Whitehead 1992).

(b) Distribution according to ability to pay

This view of equity in health care emanates from the libertarian philosophical perspective. It mainly points towards a private health care sector where health care is solely rationed by individuals' ability (and sometimes willingness) to pay (Wagstaff and Van Doorslaer 2000). This view has been criticized by many as not instilling a sense of fairness because it brings about inequality in the utilization of health care to the favor of the rich and consequently, it has been disregarded by many (Smith 2009, Wagstaff and Van Doorslaer 2000). This is so because, linking one's capability to pay for health care to one's utilization privilege violates the principle of equal access (regardless of how access is defined) by acting as a financial barrier to those who cannot afford to pay (Wagstaff and Van Doorslaer 2000). It is further stated that, this kind of distribution will deter people (especially the poor) from using health care facilities and this reduces their chances of seeking the necessary health care when it is needed and this is likely to perpetuate the ill health among the poor (Cutler et al. 2008, Wagstaff and Van Doorslaer 2000). Distributing health care according to ability to pay will be even more detrimental in low and middle-income countries where the majority of people are poor (Sumner 2012). Consequently this definition will not be considered for this study.

(c) Equal quality of health care

This definition is based on a strict egalitarian view. It raises concerns over the procedural aspect of health care provision. Whitehead (1992) suggested that health care providers ought to attach the same level of commitment into service provision, so as to offer a high standard of care to all. This definition further necessitates that identical health care be distributed equally to all individuals (Whitehead 1992, Burt 2010). Allocating an equal amount/quality of care to all patients regardless of severity of illness is likely to bring about an over-provision of care to the less critically ill while there may be an under-provision to the critically ill. Therefore, this kind of distribution is likely to move some individuals (the more

severely ill ones) to a more inferior state than it may have been before the equal distribution (Culyer, Wagstaff 1993).

(d) Equality of health

Equality of health, which was proposed by Mooney (1983), maintains that equity in health care is attained when there is equality of health status. This definition conforms to Sen's theory of equality, where health outcomes are considered to be an important functioning, as part of a person's capability set (Smith 2009). (Smith 2009) further argues that the pursuit of health equality in the distribution of health care is an important objective¹. However, this definition is said to be unrealistic since health care utilization is indeed not the only factor that brings about health status variations (Whitehead 1992). Therefore, acting in isolation any distribution of health care (even equitably distributed) will not bring about equality in health (Whitehead 1992). Other factors that are identified as contributing towards differences in health status include past and present genetic dispositions as well as individuals' social environments (Whitehead 1992). Therefore, seeking to equalize health would require a multi sectoral approach.

(e) Equal access

Equality of access to health care as a definition of equity in health care use fits with Rawls' principle of "equality of opportunity" (Smith 2009). Often narrowed down to equal access to available health care for equal need, this definition requires an equal entitlement to the available health care services for all (Mooney et al. 1991). Access has been defined in a number of ways. Le Grand (1982) and Mooney (1983) define access as the money and time costs incurred in using health care services. Alternatively, access is defined as the maximum attainable consumption given individuals' income, time and money prices associated with the usage of health care (Olsen and Rogers 1991). Further, access has been defined as the empowerment of individuals to use services and that access is a multidimensional concept (comprising of three dimensions: availability, affordability and acceptability) (McIntyre and Thiede 2009). The availability dimension concerns "whether the appropriate health care providers or services are supplied in the right place and at the right time to meet the

¹ Although Sen's theory is mainly about attaining equality in capability to function and not really on equality in the functioning, practical usage of this theory mainly concentrates on the 'functionings' themselves (i.e. actual achievements) as opposed to capabilities to function (Wagstaff and Van Doorslaer 2000 and Smith 2005)

prevailing needs of the population” (McIntyre and Thiede 2009: 184) The affordability dimension concerns itself with the link between the total costs of health care and the users’ ability to pay these costs (McIntyre and Thiede 2009: 141). The acceptability dimension looks at the degree of fit between providers and clients’ expectations, practices, beliefs as well as attitudes towards each other (McIntyre and Thiede 2009).

Mooney et al. (1991) suggested that ‘equality of access’ as a conceptualization of equity is advantageous because it conforms to Paretian welfare economics, which in turn respects consumer preferences. Consumer preferences are based on the axiom that individuals’ preferences and therefore choice of acquiring a good are independent of prices and income (see Rice 1997 for details). This means that other definitions ignore consumer preferences with regards to using health and this is at best considered unethical (Mooney et al. 1991). Further, a number of economists find this argument unrealistic because they do not accept the assumptions of consumer preferences (i.e. that choices’ are independent of income and prices) and therefore, Paretian welfare economics to be applicable to health and health care (Williams 1981, Rice 1998). Therefore according to Culyer (1992), being in accordance with Paretian welfare economics is a point in their disfavor.

(f) Distribution according to need

Emanating from an egalitarian perspective, distribution according to need requires that health care be allocated to individuals on the basis of their need (Culyer and Wagstaff 1993). Others state this definition differently as utilization according to need (Mooney 1983). This definition has two streams a vertical and a horizontal version². Taking individuals’ needs into account, this definition is perceived to be somewhat advantageous. However, it is also criticized from this same front, as what constitutes ‘need’ is not concisely agreed upon (Culyer and Wagstaff 1993). The proponents of distributing health care according to need hold the view that it brings about equality of health (Miller 1976). However, Culyer and Wagstaff (1993) suggest that this may not always be the case. They arrived at this conclusion when they tried to validate this idea using 3 different definitions of need and found that all 3 yielded different degrees of inequalities in health (Culyer and Wagstaff 1993). For example, where need is defined as ill health, even though two individuals have the same need (i.e. illness) and are each given an equal amount of health care this is no guarantee that the two

² To be explained in next subsection

will end up with an equal health status since health is also dependent on other factors (Whitehead 1992).

What then, is the definition of equity in health care that is adopted for this study?

The distributional perspective that a country's system applies is one dimension of performance that warrants attention because it is one of the main axes on which health systems are commonly appraised (Lu et al. 2007). The Zambian health system like that of its former colonial masters, Great Britain, concerns itself with some forms of egalitarian principles. For instance in the Zambia vision 2030, the Ministry of Health clearly states that its main aim is to achieve equality in access to and utilization of health care for all its citizens and should not by all means be attached to ability to pay (Ministry of Finance and National Planning 2010). For this reason all other definitions are dropped and choice remains between equal access and distribution according to need. This study uses the 'distribution according to need' definition. Despite its shortcomings, it is popularly used in similar studies.

Horizontal and vertical equity

Horizontal equity in the health care utilization context requires an equal utilization of health care for those with equal need. On the other hand, vertical equity requires unequal utilization of health care among individuals' of unequal need (Braveman et al. 2005). For this study we employ the horizontal version. The choice of horizontal equity over vertical equity stems from the fact that; firstly, the analysis of horizontal equity is considered less problematic than vertical equity in the sense that vertical equity necessitates further value judgments about the way use of health care must vary amongst individuals with different health care needs (Gravelle et al. 2006). Secondly, horizontal equity has been used extensively in other studies and we therefore desire to conform to what is widely adopted (Gravelle et al. 2006, Morris et al. 2005, Sutton 2002).

Need

Because this study uses 'distribution according to need', as a measure of equity in health care use, it is necessary to explore how 'need' has been defined in literature. 'Need' like 'equity' is subject to diverse interpretations and this section therefore explores the various

interpretations that are used in literature. These are: (a) Initial illness (b) capacity to benefit (c) expenditure needed to exhaust capacity to benefit to zero.

(a) Need as initial illness

Defining ‘need’ as initial ill health is founded on the philosophical work of many authors, among them are Williams (1962) and Gillion and Hemming (1985) who argue that individuals who are ill are in greater need for health care. This definition is not considered too strong, as it has been argued that despite being ill an individual cannot be said to need health care if existing technology cannot improve their health status (Culyer and Wagstaff 1993). This definition is also hampered, as it does not tell how much health care an individual would actually need (Culyer and Wagstaff 1993). However, this definition is widely used in empirical work that mainly explores equity with respect to health care (Wagstaff and van Doorslaer 2000).

(b) Need as capacity to benefit

Based on the consequentialist principle³, this definition offers that an entity is only needed as long as it can fulfill some stated goal (Culyer and Wagstaff 1993). A marginal need is declared if the expected marginal productivity in terms of achieving the health goal (usually health status) is positive (Culyer and Wagstaff 1993). Although considered an improvement to ‘need as initial health’ it also leaves unanswered the question of how much health care an individual actually needs (Culyer and Wagstaff 1993). Such information is dependent on the relationship between health care expenditure and their output (health improvement) (Culyer and Wagstaff 1993).

(c) Need as expenditure required to exhaust capacity to benefit

Culyer and Wagstaff (1993) perceive this to be the most appealing definition of ‘need’ because it points towards the relationship between health care and its main output (health improvement), which the two previous conceptualizations failed to consider (Culyer and Wagstaff 1993). Here need is defined as the amount of health care expenditure that an individual would use in order to move the marginal productivity of achieving a stated goal (i.e. capacity to benefit) to zero (Burt 2010). However, this definition would require additional information about specific diseases, medical personnel’s opinions as well as

³ The Consequentialist principle is based on the notion that a deed’s (or an act’s) worthiness is judged by its end results (i.e. its capability to achieve a stated end result). [See Barry (1965) for more details].

expenditure for various illnesses (Culyer and Wagstaff 1993, Burt 2010). Rarely is such information available especially in developing countries.

How is ‘need’ defined in this study?

The definition of “need” used in this study is presence of ill health. Ways of measuring ill health range from more narrowly defined single measures to more complex, composite measures. The common way to measure health status involves the usage of self-reported subjective health measures. One simple way involves a single item question where respondents are asked to state whether they have been ill in a specified period (usually ranging from 2 to 4 weeks) prior to being interviewed (O'Donnell 2008). Another single item approach, which perhaps is the most common, involves asking respondents to rank their perceived health status (which is normally based on one's ill/good health status) (O'Donnell 2008, Garcia 2010). In principle, these two mentioned approaches are solely based on individual perceptions and as a result, there is likely to be a distinct difference between how one ranks their health and their actual having an illness (Garcia 2010). Another way to measure illness is through self-reporting of chronic diseases and impairments, although also based on individual perception, this method reflects mainly medical dimensions of health, which could be also objectively verified (Garcia 2010). Alternatively, initial ill health status can be measured by gauging individuals' ability to care for themselves, mobility, and pain e.tc. More complex measures involve the formulation of algorithms that bring together a number of measures to create a single index such as the EQ5D and the health utility index (Ataguba and McIntyre 2012). For this study, we employ a composite measure of illness. This composite measure incorporates illness/injury in the 2 weeks prior to the survey, functional limitation and continuous illness for at least 3 months prior to the survey. Since the two latter measures are more reliable depictees of need because they are normally medically consistent, they are combined with the first one to reduce the bias of self-reported illness.

Conceptualizing equity in the distribution of health care

After choosing the ‘distribution according to need’ definition for equity in health care use, by opting for its horizontal version and by defining need as initial illness we finally

conceptualize equity in health care utilization as: 'equal utilization for equal need across socioeconomic groups'.

B. Methodological review

There are several approaches to investigating inequality in health care utilization. The simplest approach is the range, which involves comparing the utilization of the highest and lowest socioeconomic groups. Another approach is the Lorenz curve approach, which plots the cumulative proportion of the population (beginning with the lowest users of health care to the highest users of health care) against the cumulative proportions of health care use (Wagstaff and van Doorslaer 2000). An alternative approach to measuring inequality is the index of dissimilarity which is measured as the difference between a given groups' share of the populations health care use and that groups' population share, halved and summed across all groups and then taking the absolute value (Wagstaff et al. 1991). Another approach known as the "slope index of inequality" is the slope of the regression line depicting the relationship between a socioeconomic group's health care use and its relative rank in the socioeconomic distribution (Wagstaff et al. 1991). Furthermore, inequality in health care use can be visually determined using a concentration curve, which shows the cumulative proportion of population (from poorest to richest) against the cumulative proportion of health care use (Wagstaff et al. 1991). Related to concentration curve is the concentration index. The concentration index is calculated as two times the area between the concentration curve and the 45-degree line and is also used to determine the presence of inequality (O'Donnell et al. 2008).

Measurement of horizontal inequity in health care utilization involves testing the extent to which health care utilization is or is not distributed according to need, regardless of individuals' socioeconomic status (Wagstaff and van Doorslaer 2000). One way of measuring inequity entails running regressions that could either be logistic and probit models. The dependent variable representing health care utilization is regressed against need variables (Pamuk 1985, Wagstaff et al. 1991). Alternatively, and perhaps the most common approach to measuring inequity involves constructing concentration curves and therefore concentration indices. To account for need, whilst using concentration indices, two methods are proposed; the direct standardization approach and the indirect standardization approach. The former approach makes an estimation of how much care each group ought to take delivery of, if both

groups had the same level of need and whilst the latter approach takes each individual separately and estimates the amount of health care that would be received if that individual was treated the same way as those with the need characteristic (O'Donnell et al. 2008, Wagstaff, Van Doorslaer 2000).

C. Empirical review

Studies from developed countries show inconsistent results pertaining to inequalities/inequities in health care utilization. Primary health care is in most cases equitably distributed in countries that have achieved universal coverage⁴ (Borrell et al. 2001, Van Doorslaer et al. 2006, Van Doorslaer et al. 2000, Van der Heyden et al. 2003, Finkelstein 2001, McIsaac et al. 1997). However, inequitable distributions are also found, with most of these being pro-poor (Asada and Kephart 2007, van Doorslaer et al. 2004, Van Der Meer et al. 1996). In terms of specialist care, most studies have revealed that people of low socioeconomic status utilize less health care than their more well-off colleagues (Van Doorslaer et al. 2000, Van Doorslaer et al. 2006, Schoen and Doty 2004, Van der Heyden et al. 2003), yet findings of pro-rich utilization of specialist care also exist (Finkelstein 2001). These inconsistent results may be due to variations in how need for health care was measured and/or in differences in patterns of socioeconomic status and health care use (Kephart and Asada 2009).

Literature pertaining to equality and equity in low and middle-income countries is scarce. However unlike that of developed countries the results are somewhat consistent. Amidst this scarcity, a great and substantial amount of literature points towards the existence of inequalities in health care utilization. Most studies that involve analyzing socioeconomic differences in health care utilization reveal pro-rich inequalities (Zere et al. 2007, Pessoto et al. 2007, Bonfrer et al. 2012). When adjusted for 'need', generally, the results of most studies still pointed towards pro-rich distributions (Bonfrer et al. 2012, Szwarcwald et al. 2010). The only exception to this consistent pro-rich finding was found in the more developed Mauritius where results revealed that inequalities/ inequities in health care use were pro-poor (Bonfrer et al. 2012).

⁴ Universal coverage usually refers to a health care system, which provides affordable health care and financial protection to all citizens for a specified benefit package when it is needed (see Carrin. 2008).

Most studies in developing countries have mainly focused on inequalities of specific diseases and on specific health intervention (Gwatkin 2000). Most studies in the area of equality and equity have mainly considered access to maternal and child health care services, children immunizations and also inequalities in a number of maternal and child health outcomes including infant mortality, under-five mortality, underweight and stunting in children (Almqvist 2010, Van de Poel et al. 2008, Van de Walle 1992, Gwatkin 2000, Foster 1996, University of Zambia Department of Economics, Ministry of Health and TARSC 2011). With regards to all these services and outcomes it has been consistently found that utilization is disproportionately concentrated among wealthier individuals and consequently, pro-rich inequities exist (Bonfrer et al. 2012, Poel et al. 2008, Almqvist 2010, University of Zambia Department of Economics, Ministry of Health, TARSC 2011, Gwatkin et al. 2004).

In Zambia, only two previous studies have been found, particularly pertaining to inequalities in health care utilization and were conducted by Makinen et al. (2000) and Bonfrer et al. (2012). Bonfrer's study examined the extent to which health care utilization was distributed according to need in 18 African countries, with Zambia inclusive. Using 2007 data for Zambia, this study revealed pro-rich socioeconomic inequalities in the general use of health care services after need (which was measured by an ill-health index) were accounted for (Bonfrer et al. 2012). Similarly, the much earlier Makinen et al. (2000) study which used 1995 data observed that health care seeking among wealthier socioeconomic groups was higher than that of lower socioeconomic groups and thus it was concluded that pro-rich inequality in the general utilization of health care services was present. However, this study did not adjust for health care need.

In summary, it has been noticed that literature on socioeconomic inequalities in health care utilization in developing countries and specifically, Zambia is very sparse. And the few that exist find mostly pro-rich inequality and inequity (Makinen et al. 2000, Bonfrer et al. 2012). Most of the previous studies in Zambia have essentially dedicated their work to inequalities/inequities in health outcomes including maternal health care services, under-five health care services, and child immunizations (Gwatkin et al. 2004, Van de Poel et al. 2008, Almqvist 2010, Ministry of Finance and National Planning 2010). Although measuring inequalities in the above mentioned health outcomes and utilization of maternal and child health care services are deemed important for a developing health system like that of Zambia,

they only depict a small component of the health system, therefore, only shedding light on a few aspects of the great challenges that engulf the entire system.

The purpose of this study therefore, is to fill the gap in information by measuring socioeconomic inequalities in health care utilization in Zambia further than the more commonly observed inequalities in maternal and child health outcomes and the use of maternal and child health care services. Secondly, two previous general health care utilization inequality studies of which Zambia is a part did not disaggregate by level of care and are not so recent i.e. based on 1995 and 2007 data for the Makinen et al. (2000) and Bonfrer et al. (2012) studies respectively. Bonfrer's study uses 2007 data, only a year after user fees were abolished. More recent results are therefore necessary and the more recent 2010 data set will contribute towards the evidence base. This recent evidence will then be used to see if amidst health reforms, inequalities are reducing. Further, both studies by (Bonfrer et al. 2012) and (Makinen et al. 2000) are cross-country studies where Zambia is one of 18 and 8 other countries respectively. This study rather pays attention to Zambia only and is a cross-facility study and through this, it is expected that this study will shed better light on socioeconomic health care utilization inequalities and inequities in the country.

Methods

Data sources

The study uses data from the *Zambian Living Conditions Monitoring Survey (LCMS) 2010* also known as the *Indicator Monitoring Survey*. The Central Statistical Office (CSO) between January and April of 2010 conducted this survey. The LCMS - 2010 is a nationally representative survey and used a two-staged stratified cluster sampling strategy (Central Statistical Office 2011). The first step involved the selection of 1000 Standard Enumeration Areas (SEAs)⁵ with Probability Proportional to Estimated Size (PPES) within the respective strata. The second step involved the systematic selection of approximately 20,000 households from an enumeration area register, which comprised both rural and urban and from all the nine provinces (Central Statistical Office 2011). The survey collected a wide range of information on the living conditions of individuals and households in the areas of health,

⁵ Standard Enumeration Areas (SEAs) are physically demarcated land areas of the entire country into unique areas of equal population size. The SEAs forms the lowest geography from which aggregates of indicators are compiled for ward, constituency, district, province and national level (Census 2010).

education, sources/levels of income, consumption expenditures, economic activities, production, including various demographic characteristics such as; age, sex, location etc.

Measuring socioeconomic status

This study employs household consumption expenditure as a measure of socioeconomic status. Household consumption expenditure is preferred to other commonly used measures of socioeconomic status such as income. This is based on the well-known arguments that are made in favor of household consumption expenditure giving a better reflection of current living conditions (Van de Walle 1992). In addition, in a developing country context, where organized labor markets are limited, household expenditure is said to be less variable and is also less susceptible to being under-reported as compared to income (Van de Walle 1992). In this study, consumption expenditure is based on households' reported consumption and expenditure on food, housing, transport, utilities, beverages and other non-food items. In addition it includes consumption of goods from sources other than purchases from the market.

Common belief supposes that various household dimensions have an important bearing on household consumption expenditure and consequently need to be accounted for in order to obtain an adequate proxy for socioeconomic status (Banks and Johnson 1994). These dimensions include the number of persons in a household and the household's demographic composition, which includes gender, age and at times marital status (Banks and Johnson 1994, Bönke 2007). Taking these factors into account will facilitate the conversion of originally heterogeneous households into artificial homogenous households and therefore, a dependable assessment of inequalities in living standards across the heterogenous households could be obtained (Bönke 2007). Following this practice, household consumption expenditure in this study will be adjusted for household size and composition (Deaton and Zaidi 2002, O'Donnell et al. 2008). Therefore, an adult equivalent scale (E) will be obtained as follows:

$$E = (A + \alpha K)^\beta \quad (1)$$

Where A= number of adults (above or equal to 16), K= number of children (below 16), α is child adjustment which is a measure of the weight accorded to children relative to adults (Banks and Johnson 1994). β is elasticity capturing economies of scale (O'Donnell 2008). Following recommendation by various academics' α and β were set equal to 0.5 and 0.75

respectively (see Akazili 2010, Ataguba and McIntyre 2012, Deaton and Zaidi 2002). Because of the uncertainty involved in recommending values for α and β , the analysis will also be performed using the extreme values of 0.3 and 1.0 (Deaton and Zaidi 2002).

Measuring inequality in health care utilization

In order to obtain a more distinguished relationship between health care utilization and socioeconomic status, we standardize the health care utilization variable, by age and sex. Measuring income related inequities in health care use in the Netherlands; Van de Meer (1996) also standardized health care use by age and sex. The reason behind this standardization is not to build a casual, or structural, model of health care utilization determination. However, the analysis remains descriptive, but a more distinguished relationship between a health care utilization variable and socioeconomic status is established (O'Donnell 2008). Why age and sex? Age and sex are both correlated with health care utilization and socioeconomic status and therefore confounding variables (Van de Meer 1996). Studies have shown that women report more ill health symptoms, report worse health status and are also more likely to use health care services (Szwarcwald et al. 2010). Further, older persons are more susceptible to being ill and ideally said to consume more health care (Szwarcwald et al. 2010). And for these reasons we standardize health care utilization.

For this we employ the indirect standardization method. Indirect standardization is employed over the alternative, direct standardization because the direct standardization approach, which can only be employed, on grouped data is affected by the number of socioeconomic groups, thereby making it unreliable (O'Donnell et al. 2008). The indirect standardization approach “rectifies” the real distribution by comparing it with the distribution that would be seen if all persons had their own age but the same mean age effect as that of the whole entire population (O'Donnell et al. 2008). Firstly, a predicated health care utilization value h_i^X is estimated as follows (O'Donnell et al. 2008):

$$h_i^X = \alpha + \sum \beta_j x_{ij} \quad (2)$$

Where x_{ij} is the standardizing variable (i.e. the age and sex compound).

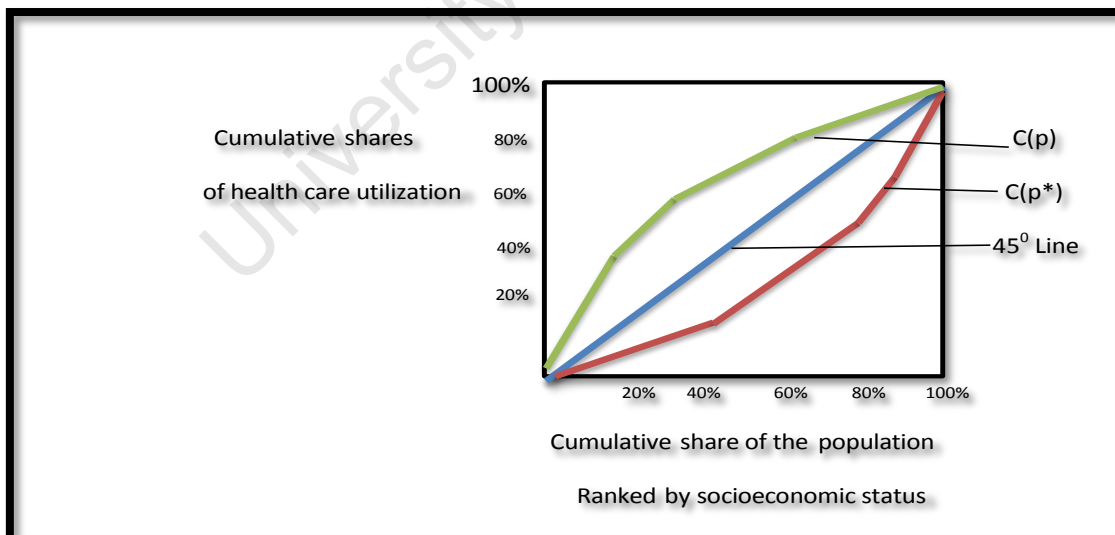
Secondly, age-sex standardized health care utilization h_i^{IS} is obtained using the following OLS process (O'Donnell et al 2008):

$$h_i^{IS} = h_i - h_i^X + \mu \quad (3)$$

Where h_i represents the health care utilization value, h_i^X represents the predicted value that incorporated age and sex which was obtained in equation (2)) and μ represents mean of the health care utilization variable.

Following common methodology in the analysis of inequality, this study like Van Doorslaer (2006) uses concentration curves to graphically examine the pro-poorness/pro-richness of the distribution of health care utilization. A concentration curve shows the cumulative share of the health variable (which in this case is age-sex standardized health care utilization) accounted for by cumulative shares of individuals in the population ranked from most disadvantaged (poorest) to least disadvantaged (richest) (Kakwani et al. 1997, Wagstaff et al. 1991). Figure 1 is an example of concentration curves for health care utilization. If the concentration curve $C(p)$ lies above the line of equality (i.e. the 45 degree line from bottom left corner to top right corner) then health care utilization is concentrated in the lower socioeconomic groups, whereas if the concentration curve $C(p^*)$ lies below the line of equality then the opposite is the case (Wagstaff et al. 1991). Further, if the concentration curve corresponds with the line of equality then health care utilization is equally distributed across groups.

Figure 1: concentration curve for health care utilization



Since concentration curves are estimated from survey data, there is a possibility of sampling variability and therefore simply comparing of curves is insufficient for establishing statistical dominance (O'Donnell et al. 2008). For this reason, there is need for formal statistical tests of dominance between the concentration curves and the line of equality (O'Donnell et al. 2008).

In this study dominance of curves will be determined using the Multiple Correspondence Analysis decision (MCA) rule. Using this decision rule dominance exists if there are significant differences at any quantile (O'Donnell et al. 2008).

Although concentration curves are deemed greatly appropriate for providing a comprehensive picture of how a health variable, age-sex standardized health care utilization in this case, fluctuates across an entire distribution of socioeconomic status, such an analysis provides no depiction of the overall extent to which age-sex standardized health care utilization varies across the distribution of socioeconomic status (O'Donnell et al. 2008). In this respect, the study further computes concentration indices to quantify the extent of inequality. Taking on values between -1 (when the population's health care utilization is concentrated among the poor) and $+1$ (when the population's health care utilization is concentrated among the rich) a concentration index measures the extent of inequality in the health variable that is systematically related with socioeconomic status (Wagstaff et al. 1991).

The concentration index (CI) which we use to measure socioeconomic related inequality in health care utilization has been defined as twice the area between the concentration curve, say $C(p)$, and the line of equality which is given as the two times covariance between health care utilization and the fractional rank (O'Donnell et al. 2008).

$$CI = \frac{2}{\mu} cov(h, r) \quad (4)$$

where h is health care utilization and r is the fractional rank

The age-sex standardized CIs and their standard errors are to be more conveniently obtained using the ordinary least square (OLS) regression (Kakwani et al. 1997):

$$2\sigma_r^2 (h_i^{IS}/\mu^{IS}) = \alpha_0 + \alpha_1 r_i + \varepsilon_i \quad (5)$$

Where h_i^{IS} is age-sex standardized health care utilization, μ^{IS} is the mean of h_i^{IS} , σ_r^2 is the variance of r_i , with r_i being the weighted relative fractional rank of the i th household in the consumption expenditure distribution. α_1 is the OLS estimate of the slope coefficient gives the concentration index standardized (CI_{IS}) estimate. This process will be done for primary (i.e. health posts and clinics) and higher level, hospitals.

The concentration index for a dichotomous variable lies between $\mu - 1$ and $1 - \mu$, where μ is

the mean of variable Wagstaff (2005). To correct this, Wagstaff (2005) proposes dividing the concentration index by $1 - \mu$. However, Wagsataff's approach is criticized by Erreygers who suggests that it "blow(s) up the levels of measured inequality for distributions with either high or low means" (Ataguba et al 2011 p.3). However, Wagstaff approach shows little difference between the normalized index and the ordinary index and the ordering of inequality also remains the same for both measures (Ataguba et al 2011). In addition, Erreygers normalized index can be obtained by scaling the Wagstaff's normalized index (Ataguba et al 2011). Consequently, Wagstaff's normalization method is used in this study.

Because the above defined concentration index is based on socioeconomic inequalities in health care use, which is characteristically a dichotomous variable, we use the normalized version of the concentration index as suggested by Wagstaff (2005) and is obtained as follows:

$$C_H = CI_{IS} / (1 - \mu^{IS}) \quad (6)$$

where C_H is the Wagstaff normalized/age-sex standardized concentration index for health care utilization, CI_{IS} and μ^{IS} are as previously defined.

Comparing the distribution of health care utilization to need

Though the above-specified age-sex standardized concentration index measures socioeconomic related inequality in health care utilization, it does not measure the extent of inequity in health care utilization (i.e. distribution according to need) as it accounts for reasonable socioeconomic disparities in utilization due to need disparities (Lu et al. 2007). The extent of horizontal (in) equity is measured by comparing each socioeconomic group's share of need with its share of health care utilized. Therefore, in this study the deviation in the extent to which health care utilization is distributed according to need (i.e. inequity) is estimated using the horizontal inequity index (HI) (Van Doorslaer et al. 2000). This index estimates socioeconomic related inequality in health care utilization after adjusting for differences in health care need and has been defined as twice the area between the health care utilization and need concentration curves (O'Donnell et al. 2008). A horizontal equity index will be obtained in this study. This index is numerically calculated as the difference between the Wagstaff normalized/ age-sex standardized health care utilization concentration index, and Wagstaff normalized/ age-sex standardized need concentration index.

Need is standardized, because like utilization, age and sex are both related to need (which in this study is illness) and socioeconomic status. Age-sex standardized concentration index for need (CI_N) is obtained in the exact way age-sex standardized health care utilization was obtained. Firstly, by employing equations similar to equations (2) and (3) and by replacing ‘utilization’ with ‘need’ and the ‘mean of utilization’ by ‘mean of need’ respectively a need predicted value and need standardized are obtained. This is then followed by using an equation similar to equation (5) and also by replacing the utilization variables by need variables. Need being a dichotomous variable, the age-sex standardized concentration index for need is normalized using Wagstaff’s normalization approach to obtain a normalized concentration index for need (C_N).

By subtracting C_N (the Wagstaff normalized /age-sex standardized concentration index for need) from C_H (the Wagstaff normalized /age-sex standardized concentration index for health care utilization), the horizontal inequity index (HI) is obtained as follows:

$$HI = C_H - C_N \quad (7)$$

A positive HI value signifies a pro-rich inequity and a negative value signifies a pro-poor inequity and a value of zero shows that health care utilization and need are proportionally distributed across the income distribution (Cisse et al. 2007).

In summary, this study estimates Concentration Indices (estimating socioeconomic-related inequality in the distribution of health care utilization) as well as HI’s (estimating socioeconomic related inequality in the distribution of health care utilization after adjusting for need differences) for each of the health care levels; primary (i.e. health posts and clinics) and secondary facilities, namely hospitals.

Research ethics

This study’s analysis involves the use of an existing data set i.e. the living conditions and monitoring survey data set. This use of secondary data is therefore not expected to raise any ethical matters. Moreover, this study is part of a much bigger ‘Strategies for health insurance in less developed countries (SHIELD)’ project. However, before analysis, ethical approval was sought from the University of Cape Town’s Human Research Ethics Committee (HREC).

Dissemination of findings

The findings from this study will be disseminated mainly through publications. The two publications resulting from this research include a journal article and a policy brief. This is in fulfillment of the Master's in Public Health (MPH) – Health Economics dissertation requirement. The journal article will be made available to a peer-reviewed journal. As part of the Strategies for Health Insurance and Equity in Least Developed countries (SHIELD) project, this study's results will not only be presented to country SHIELD members but will also be a part of larger cross country comparison study together with other SHIELD countries.

Budget

The budget for this study is shown in table 1 below.

Table1: study (research) budget

Item	Details	Amount
Stationary	It includes data storage; the bindings of various study sections; it also includes other supplies such as paper and pens.	R 2,500
Transport	Domestic travel (transportation, accommodation, meals)	R 2,000
Communication	Included here are, Internet and phone call costs	R 500
Overhead	Overhead cost @10% of all other costs	R 500
Total		R 5,500

References

- Abasolo, I. & Tsuchiya, A. 2004, "Exploring social welfare functions and violation of monotonicity: an example from inequalities in health", *Journal of health economics*, vol. 23, no. 2, pp. 313-329.
- Acheson, D. 2000, "Health inequalities impact assessment", *Bulletin of the World Health Organization*, vol. 78, no. 1, pp. 75-76.
- Aday, L.A. & Andersen, R. 1974, "A framework for the study of access to medical care", *Health services research*, vol. 9, no. 3, pp. 208.
- Akazili, C. 2010, *Equity in health care financing in Ghana*. PhD Thesis, University of Cape Town
- Anderson GF, Chu E. 2007. Expanding priorities—confronting chronic disease in countries with low income. *New England Journal of Medicine* 356: 209–11.
- Ataguba, J.E., Akazili, J., McIntyre, D. 2011, "Socioeconomic-related health inequality in South Africa: evidence from General Household Surveys" *International Journal for Equity in Health*, 10:48
- Almqvist, A. "Socioeconomic inequity in Zambian children's health status—differences between rural and urban areas.", .
- Asada, Y. & Kephart, G. 2007, "Equity in health services use and intensity of use in Canada", *BMC Health Services Research*, vol. 7, no. 1, pp. 41.
- Auster R, Leveson I, Sarachek D. 1969. The production of health: an exploratory study. *Journal of Human Resources* 4: 411–36.
- Banks, J. & Johnson, P. 1994, "Equivalence Scales Relativities Revisited." *Economic Journal*, July 1994, 104(425), pp883-90.
- Blas, E. & Limbambala, M. 2001, "User-payment, decentralization and health service utilization in Zambia", *Health policy and planning*, vol. 16, no. suppl 2, pp. 19-28.
- Bonfrer, I., Poel, E., Grimm, M. & Doorslaer, E.K.A. 2012, Does health care utilization match needs in Africa? Challenging conventional needs measurement, .
- Bonke, J. 1997. *Danish time use and Consumption Survey DTUC-2008/9*. Research Design. Rockwool Foundation Research Unit.
- Borrell, C., Fernandez, E., Schiaffino, A., Benach, J., Rajmil, L., Villalbí, J.R. & Segura, A. 2001, "Social class inequalities in the use of and access to health services in Catalonia, Spain: what is the influence of supplemental private health insurance?", *International Journal for Quality in Health Care*, vol. 13, no. 2, pp. 117-125.
- Braveman, P. & Gruskin, S. 2003, "Defining equity in health", *Journal of epidemiology and community health*, vol. 57, no. 4, pp. 254-258.

- Braveman, P.A., Cubbin, C., Egerter, S., Chideya, S., Marchi, K.S., Metzler, M. & Posner, S. 2005, "Socioeconomic status in health research", *JAMA: the journal of the American Medical Association*, vol. 294, no. 22, pp. 2879-2888.
- Brook RH, Ware JE Jr, Rogers WH et al. 1983. Does free care improve adults' health? Results from a randomized controlled trial. *New England Journal of Medicine* 309: 1426–34.
- Burt, J.A. 2010 'Equity, need and access in health care: a mixed methods investigation of specialist palliative care use in relation to age'. Doctoral thesis, UCL (University College London).
- Central Statistical Office (CSO) Ministry of Health (MOH) Tropical Diseases Research Centre (TDRC) University of Zambia, and Macro International Inc. 2009, "Zambia Demographic and Health Survey 2007".
- Cheelo, C., Chama, C., Pollen, G., Carasso, B., Palmer, N., Jonsson, D., Lagarde, M. & Chansa, C. 2010, Do user fee revenues matter? Assessing the influences of the removal of user fees on health financial resources in Zambia. working Paper University of Zambia.
- Cisse, B., Luchini, S. & Moatti, J.P. 2007, "Progressivity and horizontal equity in health care finance and delivery: What about Africa?", *Health Policy*, vol. 80, no. 1, pp. 51-68.
- Culyer, A.J., Van Doorslaer, E. & Wagstaff, A. 1992, "Access, utilisation and equity: a further comment", *Journal of health economics*, vol. 11, no. 2, pp. 207-210.
- Culyer, A.J. & Wagstaff, A. 1993, "Equity and equality in health and health care", *Journal of health economics*, vol. 12, no. 4, pp. 431-457.
- Currie J, Gruber J. 1996. Health insurance eligibility, utilization of medical care, and child health. *Quarterly Journal of Economics* 111: 431–55.
- Cutler DM, Rosen AB, Vijan S. 2006. The value of medical spending in the United States, 1960–2000. *New England Journal of Medicine* 355:920–7.
- Cutler, D.M., Lleras-Muney, A. & Vogl, T. 2008, Socioeconomic status and health: dimensions and mechanisms, NBER Working Paper, 14333, Cambridge.
- Deaton, A. & Zaidi, S. 2002, Guidelines for constructing consumption aggregates for welfare analysis, 2002, World Bank Publications.
- Doorslaer, E., Koolman, X. & Jones, A.M. 2004, "Explaining income-related inequalities in doctor utilisation in Europe", *Health Economics*, vol. 13, no. 7, pp. 629-647.
- Finkelstein, M.M. 2001, "Do factors other than need determine utilization of physicians' services in Ontario?", *Canadian Medical Association journal*, vol. 165, no. 5, pp. 565-570.

- Fisher ES. 2003. Medical care—is more always better? *New England Journal of Medicine* 349: 1665–7.
- Foster, P. 1996, "Inequalities in health: what health systems can and cannot do", *Journal of health services research & policy*, vol. 1, no. 3, pp. 179-182.
- Gakidou, E.E., Murray, C.J.L. & Frenk, J. 2000, "Defining and measuring health inequality: an approach based on the distribution of health expectancy", *Bulletin of the World Health Organization*, vol. 78, no. 1, pp. 42-54.
- Gillion, C. & Hemming, R. 1985, "Social expenditure in the United Kingdom in a comparative context: trends, explanations and projections", *The Future of Welfare*, , pp. 22-36.
- Gravelle, H., Morris, S. & Sutton, M. 2006, "18 Economic studies of equity in the consumption of health care", *The Elgar Companion to Health Economics*, , pp. 193.
- Gwatkin, D.R. 2001, "Overcoming the inverse care law", *Designing health programs to serve disadvantaged populations groups in developing countries*. Washington DC: World Bank.
- Gwatkin, D.R. 2000, "Health inequalities and the health of the poor: What do we know? What can we do?", *Bulletin of the World Health Organization*, vol. 78, no. 1, pp. 3-18.
- Gwatkin, D.R., Bhuiya, A. & Victora, C.G. 2004, "Making health systems more equitable", *Lancet*, vol. 364, no. 9441, pp. 1273-1280.
- Hanratty MJ. 1996. Canadian national health insurance and infant health. *American Economic Review* 86: 276–84.
- Hjortsberg, C. & Mwikisa, C. 2002, "Cost of access to health services in Zambia", *Health policy and planning*, vol. 17, no. 1, pp. 71-77.
- Illsley, R. & Le Grand, J. 1985, "Measurement of inequality in health", WSP 012. Centre for Analysis of Social Exclusion, London School of Economics and Political Science, London, UK
- Sumner, A. (2012), *Where Do the World's Poor Live? A New Update*. IDS Working Papers: 1–27. doi: 10.1111/j.2040-0209.2012.00393.x
- International Society for Equity in Health 2001, Working Definitions.
- Kakwani, N. C., A. Wagstaff, and E. van Doorslaer. 1997. "Socioeconomic Inequalities in Health: Measurement, Computation and Statistical Inference." *Journal of Econometrics* 77(1): 87–104.

- Kalua, F., Awotedu, A., Kamwanja, L. & Saka, J. 2009, *Science, Technology and Innovation for Public Health*.
- Kawachi, I., Subramanian, S. & Almeida-Filho, N. 2002, "A glossary for health inequalities", *Journal of epidemiology and community health*, vol. 56, no. 9, pp. 647-652.
- Kephart, G. & Asada, Y. 2009, "Need-based resource allocation: different need indicators, different results?", *BMC Health Services Research*, vol. 9, no. 1, pp. 122.
- Le Grand, J. 1987, "Equity, health, and health care", *Social Justice Research*, vol. 1, no. 3, pp. 257-274.
- Le Grand, J. 1982, *The strategy of equality: redistribution and the social services*, Allen & Unwin.
- Le Grand, J. & Rabin, M. 1986, *Trends in British health inequality, 1931-83*, Basil Blackwell.
- Lichtenberg FR. 2002. The effects of Medicare on health care utilization and outcomes. In: Garber AM (ed). *Frontiers in Health Policy Research*. Cambridge, MA: National Bureau of Economic Research, pp. 1–38.
- Lu, J.R., Leung, G.M., Kwon, S., Tin, K.Y.K., Van Doorslaer, E. & O'Donnell, O. 2007, "Horizontal equity in health care utilization evidence from three high-income Asian economies", *Social science & medicine*, vol. 64, no. 1, pp. 199-212.
- Macintyre, S. 1997, "The Black Report and beyond: what are the issues?", *Social science & medicine* (1982), vol. 44, no. 6, pp. 723.
- Makinen, M., Waters, H., Rauch, M., Almagambetova, N., Bitran, R., Gilson, L., McIntyre, D., Pannarunothai, S., Prieto, A.L. & Ubilla, G. 2000, "Inequalities in health care use and expenditures: empirical data from eight developing countries and countries in transition", *Bulletin of the World Health Organization*, vol. 78, no. 1, pp. 55-65.
- Mannesh, O. 2005, "Theories of Equity in health care, implications from developed and developing countries", *Iranian Journal of Public Health*, vol. 34.
- Marmot, M., Ryff, C.D., Bumpass, L.L., Shipley, M. & Marks, N.F. 1997, "Social inequalities in health: next questions and converging evidence", *Social science and medicine*, vol. 44, no. 6, pp. 901.
- Masiye, F., Chitah, B.M., Chanda, P. & Simeo, F. 2008, "Removal of user fees at primary health care facilities in Zambia: a study of the effects on utilisation and quality of care", *Regional Network for Equity in Health in east and souther Africa Discussion Paper*, , no. 57.
- McIntyre, D., Thiede, M. & Birch, S. 2009, "Access as a policy-relevant concept in low-and middle-income countries", *Health Econ Policy Law*, vol. 4, no. Pt 2, pp. 179-193.

- McIsaac, W., Goel, V. & Naylor, D. 1997, "Socio-economic status and visits to physicians by adults in Ontario, Canada.", *Journal of health services research & policy*, vol. 2, no. 2, pp. 94.
- Ministry of Finance and National Planning 2010, *Vision 2030*, Government of the Republic of Zambia, Lusaka.
- Ministry of Finance and National Planning 2005, *Economic Report 2005*, Government of the Republic of Zambia, Lusaka.
- Ministry of Health 2010, *National Health Strategic Plan 2011 - 2015*, Government of the Republic of Zambia, Lusaka.
- Ministry of Health 2008, *National Health Research Strategic Plan 2008- 2011*, Government of the Republic of Zambia, Lusaka.
- Ministry of Health 2006, *National Health Strategic Plan 2006- 2011*, Government of the Republic of Zambia, Lusaka.
- Mooney, G.H. 1983, "Equity in health care: confronting the confusion", *Effective health care*, vol. 1, no. 4, pp. 179-185.
- Morris, S., Devlin, N. & Parkin, D. 2007, *Economic analysis in health care*, Wiley.
- Morris, S., Sutton, M. & Gravelle, H. 2005, "Inequity and inequality in the use of health care in England: an empirical investigation", *Social Science and Medicine*, vol. 60, no. 6, pp. 1251-1266.
- Muzyamba, G. & Masabe, E. 1998, *Evaluation of the public welfare assistance scheme*, Government Printers, Lusaka.
- Newhouse JP. 1996. *Free for All? Lessons from the RAND Health Insurance Experiment*. Cambridge, MA: Harvard University Press.
- O'Donnell, O., Van Doorslaer, E., Wagstaff, A. & Lindelow, M. 2008, *Analyzing health equity using household survey data: a guide to techniques and their implementation*, World Bank Publications.
- Olsen, E.O. & Rogers, D.L. 1991, "The welfare economics of equal access", *Journal of public economics*, vol. 45, no. 1, pp. 91-105.
- Olsen, J.A. 1997, "Theories of justice and their implications for priority setting in health care", *Journal of health economics*, vol. 16, no. 6, pp. 625-639.
- Pamuk, E.R. 1985, "Social class inequality in mortality from 1921 to 1972 in England and Wales", *Population studies*, vol. 39, no. 1, pp. 17-31.
- Patychuk, D. & Seskar-Hencic, 2009, D. *Steps to equity ideas and strategies for health Equity in Ontario, 2008-2010*. Toronto (ON).

- Pessoto, U.C., Heimann, L.S., Boaretto, R.C., Castro, I.E.N., Kayano, J., Ibanhes, L.C., Junqueira, V., Rocha, J.L., Barboza, R. & Cortizo, C.T. 2007, "Health care services utilization and access inequalities in the Sao Paulo Metropolitan Region", *Ciência & Saúde Coletiva*, vol. 12, no. 2, pp. 351-362.
- Rawls, J. 1999, "A Theory of Justice, 1971", Harvard UP.
- Sala-i-Martin, X. 2005, *On the health-poverty trap*, Cambridge, MA: MIT Press.
- Schneider, M., Castillo-Salgado, C., Loyola-Elizondo, E., Bacallao, J., Mujica, O., Vidaurre, M. & Alleyne, G. 2002, "Trends in infant mortality inequalities in the Americas: 1955–1995", *Journal of epidemiology and community health*, vol. 56, no. 7, pp. 538-541.
- Schoen, C. & Doty, M.M. 2004, "Inequities in access to medical care in five countries: findings from the 2001 Commonwealth Fund International Health Policy Survey", *Health Policy*, vol. 67, no. 3, pp. 309-322.
- Sehamani, V. 2003, *Poverty Monitoring and Evaluation by civil society in Zambia: Rationale, Objectives and methodology*, Civil Society for Poverty Reduction (CSPR), Lusaka.
- Sen, A. 1992, *Inequality reexamined*, Clarendon Press.
- Sitali, M. 2007, *Policy Brief: Economic Partnership agreements: A challenge for trade and justice*, Jesuit Center for Theological Reflections (JCTR), Lusaka.
- Skinner JS, Wennberg JE, Fisher ES. 2001. *The Efficiency of Medicare*. NBER Working Paper 8395. Cambridge, MA: National Bureau of Economic Research
- Smith, S. 2009, "Equity in Health Care: A View from the Irish Health Care System", *An Adelaide Health Policy Brief*, Dublin, Adelaide Hospital Society, .
- Strauss, J. & Thomas, D. 1998, "Health, nutrition, and economic development", *Journal of economic literature*, , pp. 766-817.
- Sutton, M. 2002, "Vertical and horizontal aspects of socio-economic inequity in general practitioner contacts in Scotland", *Health Economics*, vol. 11, no. 6, pp. 537-549.
- Szwarcwald, C.L., Souza-Júnior, P.R.B. & Damacena, G.N. 2010, "Socioeconomic inequalities in the use of outpatient services in Brazil according to health care need: evidence from the World Health Survey", *BMC health services research*, vol. 10, no. 1, pp. 217.
- Tudor Hart, J. 1971, "The inverse care law", *The Lancet*, vol. 297, no. 7696, pp. 405-412.
- University of Zambia Department of Economics, Ministry of Health, TARSC Equity watch: assessing progress towards equity in health in zambia, EQUINET, Lusaka and Harare.

- Van de Poel, E., Hosseinpoor, A.R., Speybroeck, N., Van Ourti, T. & Vega, J. 2008, "Socioeconomic inequality in malnutrition in developing countries", *Bulletin of the World Health Organization*, vol. 86, no. 4, pp. 282-291.
- Van der Heyden, J., Demarest, S., Tafforeau, J. & Van Oyen, H. 2003, "Socio-economic differences in the utilisation of health services in Belgium", *Health policy*, vol. 65, no. 2, pp. 153-165.
- Van Der Hoog, M., 2010. *Measuring Equity in Health Care Delivery: A new Method Based on the Concept of Aristotelian Equality*. [Online] Netspar Available at: <http://arno.uvt.nl> [Accessed 23rd December 2012].
- Van Der Meer, J.B.W., Van Den Bos, J. & Mackenbach, J.P. 1996, "Socioeconomic differences in the utilization of health services in a Dutch population: the contribution of health status", *Health Policy*, vol. 37, no. 1, pp. 1-18.
- Van Doorslaer, E., Masseria, C. & Koolman, X. 2006a, "Inequalities in access to medical care by income in developed countries", *Canadian Medical Association journal*, vol. 174, no. 2, pp. 177-183.
- Van Doorslaer, E. & Wagstaff, A. 1992, "Equity in the delivery of health care: some international comparisons", *Journal of health economics*, vol. 11, no. 4, pp. 389-411.
- Van Doorslaer, E., Wagstaff, A., Van Der Burg, H., Christiansen, T., De Graeve, D., Duchesne, I., Gerdtham, U.G., Gerfin, M., Geurts, J. & Gross, L. 2000, "Equity in the delivery of health care in Europe and the US.", *Journal of health economics*, vol. 19, no. 5, pp. 553.
- Venkatapuram, S., Bell, R. & Marmot, M. 2010, "The right to sutures: social epidemiology, human rights, and social justice", *Health and Human Rights: An International Journal*, vol. 12, no. 2.
- Veugelers, P. & Yip, A. 2003, "Socioeconomic disparities in health care use: Does universal coverage reduce inequalities in health?", *Journal of epidemiology and community health*, vol. 57, no. 6, pp. 424-428.
- Wagstaff, A., Doorslaer, E.K.A. & Paci, P. 1989, "Equity in the finance and delivery of health care: some tentative cross-country comparisons", *Oxford Review of Economic Policy*, vol. 5, no. 1, pp. 89-112.
- Wagstaff, A., Paci, P. & Van Doorslaer, E. 1991, "On the measurement of inequalities in health", *Social science & medicine*, vol. 33, no. 5, pp. 545-557.
- Wagstaff, A. & Van Doorslaer, E. 2000, "Equity in health care finance and delivery", *Handbook of health economics*, vol. 1, pp. 1803-1862.
- Wagstaff, A. & van Doorslaer, E. 2000, "Measuring and testing for inequity in the delivery of health care", *Journal of Human Resources*, , pp. 716-733.

- Wagstaff, A. 2005. "The Bounds of the Concentration Index When the Variable of Interest Is Binary, with an Application to Immunization Inequality." *Health Economics* 14(4): 429–32.
- Wang, S., Chen, L., Hsu, S & Wang., S. 2012 Health care utilization and health outcomes: a population study of Taiwan *Health Policy and Planning* 2012;27:590–599
- Wennberg JE, Freeman JL, Shelton RM, Bubolz TA. 1989. Hospital use and mortality among Medicare beneficiaries in Boston and New Haven. *New England Journal of Medicine* 321: 1168–73.
- Whitehead, M. 1992, "The concepts and principles of equity and health", *International journal of health services*, vol. 22, no. 3, pp. 429-445.
- Williams, B. 1962, *The idea of equality*, in: P. Laslett and W.G. Runciman, eds., *Philosophy, politics and society* (Basil Blackwell, Oxford).
- World Health Organization 2004, "Geneva: World Health Organization", *WHO Handbook for Reporting Results of Cancer Treatments* (WHO Offset Publication No.48), .
- Zalta, E.N., Nodelman, U., Allen, C. & Perry, J. 2010, "Stanford Encyclopedia of Philosophy", Retrieved April, vol. 28, pp. 2010.
- Zere, E., Moeti, M., Kirigia, J., Mwase, T. & Kataika, E. 2007, "Equity in health and healthcare in Malawi: analysis of trends", *BMC Public Health*, vol. 7, no. 1, pp. 78.

Appendix A: Link between health care utilization and health outcomes

Presently, there are a large number of studies that seek to determine the effect health care utilization has on health outcomes. While adopting a wide range of approaches, no consensus has been reached (Auster et al. 1969, Hadley 1982, Brook et al. 1983, Currie and Gruber 1996, Hanratty 1996, Newhouse 1996, Wennberg et al. 1989, Skinner et al. 2001, Lichtenberg 2002a, Fisher et al. 2003, Cutler et al. 2006, Anderson et al. 2007). Some suggest that a positive link between the two while others suggest a negative link. Most of these studies explored the value of increased health care utilization on health outcomes in developed countries.

Most of the existing literature from developed countries where health care utilization might have reached a diminishing marginal utility and may not really be applicable to developing countries (Wang et al. 2012). Developing countries have not achieved such a level (Wang et al. 2012). And consequently, there is every reason to believe that a positive relation exists between health care utilization and health outcomes. For instance a study in a developing country, that sought to provide information on the potential adverse impact of decreased health care utilization on a number of health outcomes uncovered that mortality caused by diabetes mellitus and cerebrovascular diseases and other chronic non-communicable diseases increased significantly (Wang et al. 2012). Many ways to classify diseases and to evaluate the burden of disease have been put across. Whichever way one chooses to classify diseases, it is clear that several non-communicable chronic diseases have a high place on the burden list for low and middle income countries (Anderson et al. 2007). For example, in low income and lower middle-income countries, cardiovascular disease alone accounts for nearly 27% of deaths (Anderson et al. 2007). It is therefore not irrational to suggest that health care utilization is positively related to health outcomes in low-income countries.

Part B: Literature Review

University of Cape Town

Theoretical review of the concepts equality and equity in health care

This section starts by defining and giving a methodological overview of equality in health care use. This is then followed by an outline of theories of distributive justice, definitions of equity in health care and definitions of ‘need’ for health care. With all this, a final conceptualization of equity in health care utilization finally arrived at which is then followed by a methodological review.

Equality in the delivery of health care

Equality is in general considered to be a reasonably straightforward concept. Most literature on equalities, particularly in the health context, defines it as differences in health care use among groups of people occupying different social standings in society (Graham 2004).

Methodological approaches to measuring equality in health care

Whilst there appears to be a general agreement over what inequality in health care is, there is however less consensus over the methodology of assessment. Various methods have been put across and they range from simpler univariate analyses to more intricate multivariate analyses (Williams and Doessel 2006). Some of these methods are explored here.

The range approach

Being a bivariate approach, this method entails making a comparison between the top and bottom socioeconomic groups with respect to health care utilization (Wagstaff et al. 1991). In this case, inequality is represented as a ratio of one extreme value over the other. This approach is inherent to the shortcomings that it does not take into account the intermediate groups as well as their relative sizes and consequently, the results from using the range are often very misleading (Wagstaff et al. 1991). This problem even worsens when making comparisons with other population or other countries (Wagstaff et al. 1991).

The Lorenz curve and the Gini coefficient approach

A univariate approach to measuring inequality is the Lorenz curve and the resulting Gini coefficient. A Lorenz curve for health care use plots the cumulative proportion of the population against the cumulative proportion of health care use (Williams and Doessel 2006). The Gini coefficient is twice the area between the Lorenz curve and the line of equality

(Williams and Doessel 2006). Unlike the range, this approach is meritorious on the ground that it accounts for all individuals and not just those in extreme groups (Wagstaff et al. 1991). Proponents of this approach further state that by ignoring the socioeconomic dimension, it avoids some problems, such as the problems associated with varying socioeconomic group sizes (Wagstaff et al. 1991). However, this failure to stratify the population by socioeconomic status has been criticized by others who believe socioeconomic inequality is highly related to health care (Wilkinson 1986).

Index of dissimilarity approach

Another bivariate approach to measuring inequality found in literature is the index of dissimilarity. This approach entails calculating (a) each socioeconomic group's share of population health care use and (b) each socioeconomic group's population share. To measure the extent of inequality the absolute difference between (a) and (b) for each group is obtained, summed up across all groups and is then halved (Wagstaff et al. 1991). Like the Lorenz curve and Gini coefficient, this approach suffers from the criticism that it is insensitive to the socioeconomic dimension to inequality. This is because all that is relevant here is how a "socioeconomic group's share of the population health care use compares with its population share but not with how this disparity compares with the socioeconomic group's socioeconomic status" (Wagstaff et al. 1991).

The slope and relative index of inequality approach

Under this bivariate approach to measuring inequality, the mean health care use for all the socioeconomic groups is calculated which is followed by the ranking of groups by socioeconomic status rather than by their health care use (Wagstaff et al. 1991). Bars whose heights denote the mean health care use and whose widths denote the portion of population in socioeconomic groups are erected. The slope index of inequality (SII) is the slope of the regression line depicting the relationship between a socioeconomic group's health care use and its relative rank in the socioeconomic distribution (Wagstaff et al. 1991). This relationship can also be illustrated graphically. One advantage of the SII approach is that unlike the range and the Lorenz curve approaches it is sensitive to the distribution of the population across socioeconomic status (Wagstaff et al. 1991). If an equal absolute change in health care use occurs across socioeconomic groups, absolute inequality changes. But if one is interested in the relative change, the SII must to be divided by the mean health care use and

this gives rise to the relative index of inequality (RII) (Pamuk 1985). Like the SII, the RII can be graphically illustrated.

The concentration curve and concentration index

Another bivariate method that is proposed by Wagstaff et al. (1989) and indeed considered by many to be a good measure of inequality is the concentration curve and the resulting concentration index. A concentration curve shows the cumulative proportion of population (ranked from poorest to richest) against the cumulative proportion of health care use (Wagstaff et al. 1991). Amongst all the other approaches that offer a graphical representation of inequalities in health care (i.e. the RII and the SII), the concentration curve is considered to be a more useful visual representation specifically in facilitating inter-population/inter-country comparisons (Wagstaff et al. 1991). To visually show inequality in health care use for this study, we employ this approach. However, concentration curves alone are not sufficient to estimate the extent of inequality (van der Hoog 2010, O'Donnell et al. 2008). In addition to the concentration curve, a concentration index can be estimated. Similar to the RII and SII, individuals are ordered by their socioeconomic status from poorest to richest (van der Hoog 2010). The concentration index is calculated as twice the area between the concentration curve and the 45-degree line of equality (O'Donnell et al. 2008). This approach is considered a good approach in that it measures the extent of inequality and unlike the range it considers the entire population and is sensitive to the distribution of the population across socioeconomic groups (Wagstaff et al. 1991). This study therefore uses concentration curves and concentration indices to measure inequality in health care use.

Equity

Equity like beauty lies in the eyes of the beholder (Culyer and Wagstaff 1993 p:2)

Despite the relative importance accorded to equity by policymakers, it is a multi-dimensional concept that is subject to diverse interpretations. Common to most definitions of inequity, however, is the idea that disparities (frequently referred to as inequalities) are considered to be unfair, unjust or even socially unacceptable (Wagstaff et al. 1991, Braveman and Gruskin 2003, Chang 2002). Several philosophers have postulated various dimensions exhibiting diverse orientations on how societies' resource ought to be justly/fairly distributed.

Philosophical views which are often referred to, as theories of distributive justice will be explored in this section.

John Rawls offered a prominent theory of justice in 1971. In his theory he assumes that individuals act rationally, are equal and are self-interested and are therefore bound to choose to structure society in the following way:

- Each person is to have equal rights to a total system of basic liberties that correspond to a similar system of liberty for all (first principle) (Rawls 1999).
- Social and economic inequalities are to be organized in a way that they are attached to offices and positions that are open to all under conditions of fair equality of opportunity (second principle) (Rawls 1999).
- To provide the greatest benefit to the least advantaged (referred to as the difference or maximin principle) (third principle)(Rawls 1999).

Though Rawls did not have health or health care on the list of basic liberties, others have applied his theory to the health care field in a number of different ways (Burt 2010). Drawing on the “fair equality of opportunity” (i.e. Rawls’ second principle), Norman Daniels, applying this to health care, claims that the ultimate goal of health care is to uphold normal functioning of individuals and consequently the variety of opportunities that are available to these individuals. Daniels finally concludes that in attaining this principle and therefore equity, it is vital that there is universal access to suitable health care for all (Daniels 1985). Unlike Daniels, Ronald Green’s main focus was on Rawls’ first principle and argues that health care is on the list of the basic liberties (Green 2001). He further claims that health care is in the pathway to attaining other more valuable things and as a result there ought to be equal rights to accessing this health care (Green 2001).

Beginning by criticizing the Rawlsian principles of distributive justice, Amartya Sen provides yet another theory. He states that the use of basic social commodities/goods is not sufficient to explain the differences between individuals and also individuals’ capacities to transform these commodities into whatever it is they desire (Sen 1992). He therefore argues that it is necessary to focus on individuals’ capabilities to function (i.e. the means to achieving something) when dealing with fairness in the distribution of societies resources (Sen 1980). Sen’s theory of equality then states that there ought to be equality in the space of individual’s capabilities to achieve valuable things that contribute towards their well being

(Sen 1980). In the same way Rawls' theory did not originally include health or health care, Sen's own does not do so either, but it has been applied to health by others (Anand and Dolan 2005). Although Sen's theory mainly focuses on the equalization of capabilities to function and not on the equalization of the functionings themselves, in its application to health care some have focused on equalization of the actual functioning (namely health) (Wagstaff et al. 2000, Smith 2009, UNDP 1993). This arises from that fact that, even though two individuals have equal capabilities (i.e. an equal opportunity to access health care), they could still end up with different functionings (health) (Wagstaff and Van Doorslaer 2000). Because of this, one cannot infer that because the level of one's functioning is lower than that of the other individual, that the individual has had a lower level of capability (opportunity) (Wagstaff and Van Doorslaer 2000). Among those that maintained Sen's original equality of capabilities was Ruger, who applied it to health care by suggesting that equality in access to high quality health care instills equity in health care and should be the main goal (Ruger 2006).

The main difference between Sen's capability and Rawlsian theories is that the former is concerned with the means to attain outcomes (i.e. individual's ability to choose between alternative opportunities) while Rawls theories are concerned with the opportunity itself (Burt 2010).

Rawls' first principle (equality of opportunity) and Sen's theory of equality are considered to be milder forms of egalitarianism (Burt 2010, Smith 2009). Strict egalitarianism however requires the total equalization of a given entity (Burt 2010). Though not originally applied to health/ health care, in the health care context strict egalitarianism would require that health care utilization be equally distributed to all (Burt 2010). A further alteration to the theory is conditional egalitarianism. This kind integrates efficiency principles to the egalitarian principles. An example would be Rawls Maximin/difference principle, which allows an inequality situation so long as it benefits the least advantaged (Burt 2010). Conditional egalitarianism is at best considered tantamount to a Pareto improvement (Burt 2010).

Another alternative theory of justice is Libertarianism. Libertarians are highly concerned with respecting natural human rights and specifically focusing on Locke's natural rights, which are the right to life and the right to possessions (Wagstaff and Van Doorslaer 2000). So long as individuals acquire or transfer their possessions without interfering or violating the rights of others, then these possessions are considered fairly/ justly owned (Wagstaff and Van Doorslaer 2000). Applied to health by (Williams 1993), it is suggested that health care

should be primarily and fairly distributed according to individual's ability to pay. This principle mainly points towards a private health care system.

Another alternative theory of distributive justice is utilitarianism. Utilitarian's aim at maximizing the sum of individual utilities, therefore, the fairness/ justness of an act is judged by assessing its impact on total societal utility (Wagstaff and Van Doorslaer 2000, Mannesh 2005). Utility represents an individuals' level of satisfaction, benefit or happiness they acquire from utilizing a given commodity (Rice and Unruh 1998, Glied and Smith 2011). Therefore, total societal utility is the aggregate of all individual gains, satisfaction or benefits from utilizing a specific amount of commodities in an economy (Rice and Unruh 1998). Therefore, a just distribution is attained when institutions, commodities are arranged in a way that yields the greatest net benefit (utility) for the whole society (Smith 2009).

Equity in the delivery of health care services

What is equity in the context of health care? Existing literature offers an abundant number of definitions for it. These definitions are normally linked to different philosophical perspectives (Smith 2009). They also depend on what one espouses to be fair/just or socially acceptable. Much cited is Mooney (1983) and Le Grand (1982) who define equity in health care as "equality of expenditure per capita", "equality of health", "equality of access" and "distribution (utilization) according to need". Whitehead (1992) defines it as "equal quality of care" and "equal access to available care for equal need". In this section we briefly explore and compare these definitions. In so doing, we link them to their underlying philosophical perspective. Table 1 gives a summary of the linkages between theories of justice and definition of equity in health care use.

Table 1: Link between theories of distributive justice and definitions of equity in health care

Theory of distributive justice	Equality of what (under theory)?	Equality of what? In the context of health care	Corresponding definition to equity in health care use
Libertarianism	Rights and Privileges		Distribution of health care according to ability to pay
Rawls's Theory			
➤ Equality of opportunity/ equal liberties	Opportunities and liberties	Health care access	Equal access to health care
Sen's Theory			
	➤ Functioning's	Health	Health care is distributed so as to achieve equality of health
	➤ Capabilities to function	Health care opportunities (access)	Equal access to health care
Egalitarianism			
➤ Strict egalitarianism	Any entity	Quality of health care	Equal quality of care for all
➤ Conditional egalitarianism	Any entity conditional upon another entity	Health care conditional upon need	Health care distributed according to need

Equity in health care use as: Equality of expenditure per capita

Le Grand (1982) recommends that equity in the use of health care services occurs when health services are distributed on the basis of equal expenditure per capita. This definition underlies the budget allocation formula that is popularly used in many countries (Culyer et al. 1992). Based on this definition, an equitable distribution could be attained when available health service budget is shared equally among different geographical locations according to the population size in each locality. This definition of equity in health care has been criticized on the front that it makes no allowance for differentials in need for health care by individuals of different demographic characteristics and ignores differences in prevalence of disease for different social groupings (Whitehead 1992, Culyer wet al. 1992). And for this reason this definition is indeed not perceived as equitable.

Equity in health care use as: Equality of health status

Another definition of equity in health care that was advised by Mooney (1983) is that of equality of health status. This definition which has been labeled by Whitehead (1992) as the most ambitious definition, maintains that equity in health care delivery is attained when health care is distributed in a way that brings about equality of health status for all, in all localities and across groups of different social standing or at the very least to greatly narrow the health gap. Seeking to equalize health status coincides with Sen's theory of equality. This definition has been labeled as very unrealistic considering that use of health care services is just one of the many factors that contribute to health differences (Whitehead 1992). Since health status is a product of a number of past as well as present exposures and is dependent on genetic predispositions, attaining equality in health status entails an inter-sectorial approach that would include many societal policies including those that are focused on the social and physical environments, educational and economic policies (Acheson 2000). Therefore, taking health care service use in isolation as the sole factor affecting differences in health status would not by any means see equality in the health status of the masses (Whitehead 1992).

Equity in health care use as: Equal access to available care

Several authors including Aday, Anderson and Fleming (1980) advocated for access to health services as the main dimension of equity. Access is said to be present when structural and individual factors do not determine one's entry into the health care system. This definition of equity in health care, which conforms to Sen's theory of equality, is in most cases narrowed down to equal access to available care for equal need. Despite unanimously being differentiated from utilization, access has been conceptualized differently by different authors (Burt 2010).

Mooney et al. (1991), has shown a strong commitment to this principle with 'access' defined as 'utilization costs'⁶. Based on this interpretation, equity as equality of access would mean equalizing monetary and time costs; this would entail providing more health facilities in areas

⁶ Utilization costs being the monetary cost of seeking care and time cost (i.e. the opportunity cost of one's time)

of low income so as to ensure that waiting times and accessibility are similar (Wagstaff and Van Doorslaer 2000).

Alternatively, access has been defined as the availability of appropriate opportunities to utilize health care (Whitehead 1992). Access to available care for equal need implies equal entitlement to the available services for everyone, a fair distribution throughout a given locality (usually a country) (Whitehead 1992). Inequity normally occurs when facilities are bunched up in the urban or the more affluent areas. This kind of unequal distribution of resources is said to imply that health care services are only minimally available to individuals who seemingly need them most, considering that the least advantaged individuals in society are normally in higher need of health care-“inverse care law” (Whitehead 1992).

Access has also been defined as the empowerment of individuals to use services, where access is a multidimensional concept (comprising of three dimensions: availability, affordability and acceptability) (Thiede et al. 2007, McIntyre et al. 2009). The availability dimension focuses on “whether the appropriate health care providers or services are supplied in the right place and at the right time to meet the prevailing needs of the population” (McIntyre et al. 2009). The affordability dimension concentrates on the association between the total costs of health care and the users’ ability to pay these costs (McIntyre et al. 2009). Lastly, the acceptability dimension pays attention to the degree of fit between providers and clients’ expectations, practices, beliefs and attitudes towards each other (McIntyre et al. 2009).

Generally, advocates of the ‘equal access’ definition maintain that access to health care is conceivably a more conceptually important measure than others as it is, equal opportunity to use health care that ought to be the main issue of concern when health system’s pursue their goals of equity (Mooney et al. 1991). Whether that opportunity is taken up or not by the individuals is not so important (Mooney et al. 1991). Additionally, equality of access as a definition of equity in health care is said to be advantageous because, unlike other definitions, it respects consumer preferences⁷ and therefore is in line with Paretian welfare economics (Mooney et al. 1991). Conversely, many other health economists have proposed

⁷Consumer preferences are defined as the subjective (individual) tastes, as measured by utility, of various bundles of goods. They permit the consumer to rank these bundles of goods according to the levels of utility they give the consumer. Note that preferences are independent of income and prices. Ability to purchase goods does not determine a consumer’s likes or dislikes (see Rice 1997 for detailed explanations)

that this argument is unrealistic because according to them, consumer preferences (i.e. the idea that preferences are independent of income and prices) cannot be applied to health care (Rice and Unruh 1998, Williams 1981). Culyer et al. (1992) adds on to say that equality of access conforming to Paretian welfare economics is therefore not a point in its favor.

Equity in health care as: Equal quality of care

Equal quality of health care for all corresponds with the theory of strict egalitarianism. A proponent of this definition, Whitehead (1992), moves the access-defining debate away from outcomes and pays attention to the nature of care provided. She focuses on the systematic differences between different groups with respect to the speed with which care is provided, the quantity of care and the kindness with which care is provided as constituting (in) equity in health care. In a nutshell, to achieve equity, under this principle, all individuals must be awarded an equal standard of care. Allocating an equal quality of care (i.e. equal speed, kindness, standard etc.) to all patients regardless of severity of illness is likely to bring about an over-provision of care to the less critically ill while there may be an under-provision to the critically ill. Therefore, this kind of distribution is likely to move some individuals (the more severely ill ones) to a more inferior state than it may have been before the equal distribution (Culyer, Wagstaff 1993).

Equity in health care as: Distribution according to ability to pay

Deeply rooted in the libertarian philosophical perspective, this view of equity in health care mainly points towards a private health care sector where health care is allocated by individuals' ability (and sometimes willingness) to pay (Wagstaff 2000). Many have disregarded this definition of equity because it does not bring about fairness. It leads to disparities (inequalities) in utilization, which is likely to favor the rich (Smith 2009, Wagstaff 2000). This is so because, linking one's capability to pay for health care to one's utilization privilege brings about a deterrence effect because money acts as a financial barrier especially among the poor (Wagstaff 2000). This then reduces the chances of the poor seeking the necessary health care when it is needed and this is likely to perpetuate the ill health among the poor (Wagstaff and Van Doorslaer 2000, Cutler et al. 2008).

Equity in health care as: Distribution (Utilization) according to need

Stemming from the egalitarian philosophical perspective, the notion of 'distribution according to need' suggests that equity in health care use will be achieved if utilization of health care is rationed by the need for it and not on other structural factors (Mooney 1983). If disparities with respect to use of health care services are found among groups of different social standing, this does not spontaneously imply these differences are inequitable (Whitehead 1992). These differences in the use of health care services could be as a result of individuals exercising their right not to use health care and further comparison with some need indicator would be necessary. However, if the use of health care is restricted by socioeconomic disability or any other factor not related to "need" then inequity is present (Culyer and Wagstaff 1993). Distribution of health care according to need: though advantageous in the respect that it takes into consideration the need for the preferential treatment for those with greater need, this definition is disadvantaged by the lack of a concise agreement for the meaning of 'need' (Culyer et al. 1992). Often, need is equated with ill health. Ill individuals are believed to have a relatively high need for health care (Culyer and Wagstaff 1993). Alternatively, Culyer (1976) and Williams (1974) define need in terms of one's capacity to benefit from health care. An alternative definition offered by Culyer and Wagstaff (1993) is to define need as the amount of resources required to exhaust capacity to benefit.

Despite the confusion over what need might mean this is not a sufficient reason to not use this definition (Culyer et al. 1992). Another justification for the egalitarians proposition of the distribution according to need principle is that it promotes equality of health (Miller 1976). However, Culyer and Wagstaff (1993) oppose this view to say that it does not hold in reality. When two individuals have the same need (regardless of how need is defined), and are each accorded an equal amount of health care this will not guarantee that the two individuals will finally have equal health status as health status is affected by so many other factors other than health care (Whitehead 1992, Culyer and Wagstaff 1993). But Wagstaff and Van Doorslaer (2000) argue that it possibly could be that, when ill individuals present themselves for treatment sequentially, distribution of health care in line with need for it could potentially be the best that health care providers can do to decrease inequalities in health.

Distribution according to need encompasses two generic dimensions, horizontal and vertical dimensions⁸.

Definition of equity in health care use for this study

Which of these definitions and consequently theory commands support for this study? Since these definitions do not typically bring about the same requirement with respect to resource allocation nor do they entail the same implications for the distribution of health care, a choice has to be made. Recent debates concerning which interpretation of equity in health care delivery is best and has the greatest appeal seem far from being concluded (Wagstaff and Van Doorslaer 2000). Lu et al. (2007) offers that the distributional implication /perspective that a country's system applies is one dimension of performance that warrants attention because it is one of the main axes on which health systems are commonly appraised. Therefore, it is necessary to identify the distributional perspective that Zambia applies to its system. Adopting most of its institutional arrangement/systems from its colonial masters, Britain, that apparently reflects a pro-egalitarian⁹ bias, most goals and policies in Zambia to date show a pro-egalitarian bias. For instance through the well-known Zambia vision 2030, the Ministry of Health plainly states that one of its core objectives is to attain equality in access to and utilization of health care for all its citizens which ought not be attached to their ability to pay (Ministry of Finance and National Planning 2010). In this respect, the analyses that follow in this thesis focus on the definition related to 'distribution according to need'. This choice emanates from the fact that despite having some shortcomings, it is the most commonly used definition. In addition, as been stated already, once the ill seek health care sequentially, distributing health care accordance with need for it could potentially be the best option that health care providers have for decreasing inequalities in health (Wagstaff and Van Doorslaer 2000).

Horizontal and vertical equity

Horizontal equity requires equalization of treatment among those with equal need (Braveman et al. 2005). Specifically, in health care Fein (1972) defines horizontal equity as the provision of equal health care services to individuals with an identical level of need. If two individuals have the same need (whichever way one defines 'need') they ought to receive the same amount of treatment regardless of their socioeconomic status, sex, race, etc. Vertical equity

⁸ The two dimensions of equity, vertical and horizontal will be explained later

⁹ Britain's systems are pro egalitarian (see Wagstaff and Van Doorslaer (2000)).

on the other hand requires the unequal treatment of individuals with unequal needs (Braveman et al. 2005). It also entails giving ‘superior’ treatment to those with a higher level of need (Macinko and Starfield 2002). Vertical equity differs from horizontal equity in that it disregards equal treatment for equals but rather recognizes that even though individuals are deemed to having the same need; they have different starting points in life and therefore have to be treated in an unequal manner. In this vein, vertical equity is more inclined to offering better treatment towards those that have a seemingly worse experience (Mooney and Jan 1997).

For this study we take on the horizontal version. The choice of horizontal equity over vertical equity stems from the fact that; first and foremost, the analysis of horizontal equity is far less challenging than vertical equity in the sense that vertical equity requires one to make further value judgments about how the use of health care ought to vary amongst individuals with different health care needs (Gravelle et al. 2006). Secondly, horizontal equity is commonly used in similar studies (Gravelle et al. 2006, Sutton 2002, Morris et al. 2005).

What is need?

Having taken for equity, the distribution according to need definition, an exploration of how “need” is interpreted in literature is therefore essential. The very nature of ‘need’ has been a topic much debated. As a result, various interpretations for it have been put across.

Need as ill health

In most literature, particularly in studies exploring equity in health care, it is very common to find ‘need’ branded as ill health (Burt 2010). The equating of ‘need’ to ill health is firmly rooted in great philosophical work including the works of Gillion and Hemming (1985) and Williams (1962). These authors advise that individuals who are relatively more ill are held to have a relatively greater need for health care. This idea is also found in economic literature. For example, O'Donnell and Propper (1991) suggested that individuals of equal health status have equal need and individuals with unequal health status have unequal need.

One shortcoming with this perspective of need is that; it is hard to see why an ill individual can reasonably be considered as needing health care irrespective of whether that health care has the ability to improve or prevent further deterioration of individuals’ health status. According to Culyer and Wagstaff (1992), if technology that could potentially improve an

individuals' health status is not available, then that individual cannot, realistically be said to need health care. The two authors together with Acheson (1978), further state that such an individual would need medical research or comfort and may even more importantly need health, but may not need health care. For the above reasons, defining need in terms of ill health is considered too simple and has therefore been labeled unattractive. Further, it is said that this definition, does not explicitly show how much health care a person would actually need (Culyer and Wagstaff 1992).

Need as capacity to benefit

An alternative characterization of need, which is consistent with consequentialism¹⁰, is capacity to benefit. This definition was meant to address the shortcomings of need as presence of illness. Suggested by Williams (1974), Culyer (1976) and Barry (1965), capacity to benefit is based on the basic premise that an entity (which in our case is health care) can only be needed as long as it is a required condition for some final objective to be achieved. The authors suggest that two conditions must be met for need to be established (Culyer 1976, Williams 1974). The first being that; the entity should be required in order to achieve a stated objective and the second states that; the objective in itself should be adequately worthy as to justify the usage of such a persuasive concept of "need" rather than plain preference (Culyer 1976, Williams 1974).

When looking at health care, the 'needed' entity is health care itself and the ultimate goal would have to be improved health (Burt 2010). A marginal need is to be asserted, if the expected (marginal) productivity in terms of improved health is positive (Culyer 1976). Hence the claim that ineffective health care cannot be needed. Stated differently, for something to qualify as a need, there ought to be an expected capacity to benefit from the consumption of resources. Based on the second condition, there would be no need (for health care) even though effective means to improve health status (the objective) exists, if the objective is inadequately meritorious (Culyer 1976). This condition is highly questionable in

¹⁰ Consequentialism is a philosophy that looks in end results of an act (i.e. the final outcome) Consequentialism in this context suggests that an entity can only be needed if and only if it is a necessary condition for some ultimate goal to be attained [see Barry (1965)]. In the context of health care, this definition is consequentialist, because it links need to the outcome (health) and it is quantifiable in a metric that forms a direct link to resource allocation (expenditure).

that “who ought to judge how meritorious an objective is”? (Culyer and Wagstaff 1993). This raises a lot of subjectivity. Generally defining need as capacity to benefit, like need as illness, has been discredited on the aspect that it leaves unanswered the question of exactly how much of health care an individual would need (Culyer and Wagstaff 1993). Additionally, this conceptualization is considered unsatisfactory because it measures need in terms of the entity the health care use will affect (i.e. health) rather than in terms of the entity that is needed (health care) (Culyer, Wagstaff 1993, Wagstaff and Van Doorslaer 2000),

Need as expenditures required to exhaust capacity to benefit

An alternative characterization of need is one that according to Culyer and Wagstaff (1993), leads the discussion in the direction of the link between health care and its main output-which are health improvements (in comparison with what would have otherwise been, without health care use). It is said that, technological advancement that makes the treatment of a given health condition cheaper leaves an individual’s capacity to benefit unchanged, but the amount of health care expenditures has reduced (Culyer and Wagstaff 1993). Stating that this is a better characterization of need, Culyer and Wagstaff (1993) say that need is better defined as expenditure required to attain the maximum possible health improvement or differently, as the total expenditure necessary to decrease an individual’s capacity to benefit to the margin. Under this characterization, need is said to be zero if the marginal capacity to benefit is zero. In line with health care, if the marginal capacity to benefit is positive then need for health care would be the amount of expenditure that is essential to decrease the capacity to benefit to zero (Culyer and Wagstaff 1993). A probable disadvantage of this definition is that it conflates two concepts, the extent of need and the amount of resources required to meet that need (Hurley 2000). Based on this definition, an individual with a life threatening allergic reaction who would only require a low-priced anti-toxin would be said to have less need (as measured by expenditure) than an individual who has a moderate cataract who requires eye surgery (Hurley 2000). This therefore raises questions as to whether amount of expenditure to exhaust capacity to benefit actually reflects need (Hurley 2000). Additionally this definition would require additional information about specific diseases, medical personnel’s opinions as well as expected expenditure for various illnesses (Culyer and Wagstaff 1993, Burt 2010). Rarely is such information available especially in developing countries.

Choice of definition for need

For this study, we define ‘need’ as ill health. Despite its inherent shortcomings, this choice emanates from the fact that, firstly, it is the most commonly used definition in similar studies and secondly, measuring capacity to benefit and expenditure to exhaust capacity to benefit further requires epidemiological information and disease specific health care expenditures data which are not found in the *Zambian Living conditions and Monitoring Survey (LCMS)* data. The data on which this thesis is relies.

There are a number of ways of measuring ill health. They range from simple (one component) measures to more complex (composite) measures. One simple way involves a single component question that seeks to find out whether individuals have been ill in a specific period (normally ranging from 2 to 4 weeks) prior to the study (O'Donnell et al. 2008). Another simple measure, which also happens to be the most commonly used, entails asking individuals to rank their perceived health status (which is normally linked to one's ill/good health) (O'Donnell et al. 2008, Garcia et al. 2010). Because the two above self-reported measures are based on individual perceptions of their health, what individuals report is likely to be different from what actually is (Garcia et al. 2010). An alternative measure requires individuals to report if they have any chronic condition or disabilities (such as ability to care for one self, pain, immobility etc.). Like the first two measures, this measure involves individual's subjective assessments; however some of these could be verified medically (Garcia et al. 2010). More comprehensive measures involve the formulation of algorithms that combine a number of measures to create a single index such as the EQ5D and the health utility index (Ataguba and McIntyre 2012).

Specifically, “need” used in this study is based on initial illness, which combines 3 self-reported measures). In the *LCMS* respondents were asked to state whether they were ill in the two weeks prior to interview or not, if they had an illness for 3 months continuously and if they faced any challenges in performing normal activities. Those who reported yes to any of the three questions were then considered as having need for health care.

Conceptualization of equity in the delivery of health care

Equity in health care utilization in this study is defined as the distribution of health care according to need (illness). Whilst taking the horizontal aspect of it, equity will specifically be defined as the ‘equal distribution (utilization) of health care for equal need’.

Methodological approaches to measuring horizontal inequity (i.e. equal utilization for equal need)

Le Grand's intergroup comparison approach

An early approach suggested by LeGrand (1978) involves making intergroup comparisons. It involves estimating and comparing the cost per person reporting sickness in each socioeconomic group or estimating the share of expenditure by each socioeconomic group and making a comparison with each group's share of sickness (LeGrand 1978). Le Grand's intergroup approach relies on comparing the top and bottom socioeconomic groups and can therefore be labeled a range approach to inequity measurement. Like all range approaches this measure is criticized on the grounds that it not only ignores intermediate groups and fails to consider the relative sizes of the groups (Wagstaff et al. 1991). Further, Le Grand's analysis, assumes that only ill persons receive care (LeGrand 1978). By not considering the non-ill who may also consume health care it commits ecological fallacy (Collins and Klein 1980). This is so because; the ill population and those who are actually receiving health care may not actually be the same (Collins and Klein 1980).

The Collins-Klein approach

Aimed at overcoming the shortcomings of Le Grand's range approach, Collins and Klein (1980) proposed an alternative. This approach begins by dividing the population into different need groups which is followed by a comparison of health care resources received by each socioeconomic group within each of the need groups (Collins and Klein 1980, Wagstaff et al. 1991). One weakness of this approach is that mean health care resources could be the same across the different need categories even though inequity in health care is present. Therefore, this method is not intuitively appealing (Wagstaff et al. 1991). Wagstaff et al. (1991) further criticizes this approach noting that it does not measure the extent of socioeconomic inequity but merely suggests the presence of it.

The regression approach

Another approach offered by Puffer (1986) is one that estimates an equation linking health care use to measures of need (which in most cases is proxied by health status), socioeconomic status, other demographic variables and interaction variables between

socioeconomic status and other variables. Puffer defines equity as equal access to health care for equal need but his approach nonetheless applies to equal utilization for equal need (Wagstaff et al. 1991). One single regression could be estimated for all socioeconomic groups but separate ones for the different groups could also be estimated. Socioeconomic related inequity in health care can therefore be measured by comparing regression coefficients. Equity in health care is said to occur when the intercept and coefficients are equal for all the income groups (Wagstaff and Van Doorslaer 2000). By comparing the regression coefficients it is only possible to state whether there is inequity or not but it is not possible to determine if inequity is pro-poor or pro-rich (Wagstaff et al. 1991, Wagstaff and Van Doorslaer 2000).

Concentration curve/index approach

Wagstaff et al. (1989) suggested the use of concentration curves and indices as better ways of measuring inequity. As previously defined a concentration curve depicts the cumulative proportion of the population ranked by socioeconomic status plotted against the cumulative proportion of health care utilization (Wagstaff et al. 1989). However, at this point health care need has not yet been adjusted for and two main approaches of doing this have been found in literature; direct and indirect standardization approaches.

- **Direct standardization approach**

This approach entails dividing the population into socioeconomic groups then computing need standardized health care. This is done by relating the need characteristics of the sample to the mean health care within the different socioeconomic groups (Wagstaff et al. 1991, Wagstaff and Van Doorslaer 2000). These need standardized health care use shows how much health care people in each socioeconomic group would get if they all had the same level of need as that of the entire sample (Wagstaff, Van Doorslaer 2000). From this information, standardized concentration curves could be obtained. A standardized concentration curve plots the cumulative proportion of need-standardized health care against the cumulative proportion of the population ranked by socioeconomic status (Wagstaff and Van Doorslaer 2000). Horizontal inequity is then found as the area between the standardized concentration curve and the line of equality. This produces a direct standardized-based horizontal equity index. Standardizing need through the direct approach is flawed in that it always requires the use of grouped data (Wagstaff and Van Doorslaer 2000). Wagstaff and

Van Doorslaer (2000) further conclude that the directly standardized approach is not very useful in that the resulting directly standardized horizontal equity index that is estimated is highly dependent on the number of socioeconomic groups.

- Indirect standardization approach

Due to the shortcomings of the direct approach, another option offered, and one that is employed in this study is the indirect standardization approach of need. This could be used for both grouped as well as for individual data (Wagstaff and Van Doorslaer 2000). This approach estimates a figure for each group/individual showing the quantity of health care that they would get if they had been treated equally with others with the same level of need (Wagstaff and Van Doorslaer 2000). In order to measure the extent of horizontal inequality, two concentration curves are obtained; the unstandardized health care use concentration curve and the need standardized concentration curve. Estimating the size of the area between the two concentration curves can therefore assess the extent of inequity. This is an indirectly standardized horizontal inequity index.

Empirical review

Objective of the review

This section reviews literature concerning equality and equity in the utilization of health care services, examining studies on methods used, definitions of equity in health care adopted, how need for health care is defined and more importantly, to show the typical findings of the presence of either pro-rich/ pro-poor inequalities in health care utilization. In light of this, the aim of this section is to identify gaps so as to generate some ideas about the way in which new research in this field ought to be directed.

Methods of selecting studies

Studies from both developed and developing countries were included in this review. Using the main words/phrases; equity, inequity, equality, inequality, health care utilization, health care delivery and access, studies were searched for on Google scholar, Medline, PubMed and Google. Additionally, a manual search through some of the identified studies' references was also performed.

The inclusion criteria for studies were that:

- The study had to specifically focus on measurement of inequalities and/or inequities in health care utilization or utilization of specified health care services.
- The study had to be in English

Studies reviewed

In total, nineteen studies were reviewed, of which eleven are from developed countries. Out of the remaining eight, five were from sub-Saharan Africa.

University of Cape Town

Table 2: Summary of findings from developed countries

Study	Country (s) and (year of analysis)	How inequality/inequity is measured	Has country(s) of analysis attained Universal coverage?	Socioeconomic status measure	Definition of equity	Definition of need	Study focus	Findings and Explanations
(Lu et al. 2007)	South-Korea (1998) Taiwan (2001) Hong Kong (2002)	Concentration indices	Yes	Household income	Equal treatment for equal need	Interaction between self assessed health status, activity limitation and age & gender	Horizontal Inequity in health care utilization	<p>South Korea: pro-poor inequality in doctor, GP and specialist care utilization. This pro-poor inequality is explained by the presence of Medicaid that caters for the poor and the absence of co-payments. The poor are admitted more to hospitals for social reasons. On the other hand, pro-rich inequity for tertiary facilities is observed where there are some co-payments</p> <p>Taiwan: Generally equity holds, however pro-poor inequity in primary health care centers and pro-rich inequity in higher tertiary centers. Pro-poor use of western doctors and hospital admissions which are as a result of deliberate policy interventions such as mobile health services and exemptions of co-payments for the poor</p> <p>Hong Kong: pro-rich inequalities in western doctor use, GP use, and specialist care. The concentration of private coverage among the better off individuals in the population is the major driver of the utilization distributions of all service types and consequently the pro-rich inequities</p>

Table 2 continued: summary findings for developed countries

(Shadmi et al. 2011)	Israel (using 2009 data)	Multivariate logistic regression	Yes	Possession of social security weaver	Equal utilization for equal need	Age and gender index and comorbidity index Morbidity burden index	Horizontal inequity in health care utilization	Pro-poor utilization of primary, specialist, diagnostic and hospitalization services Pro-poor for primary and hospitalization. And pro-rich for specialist and diagnostic services. A Possible explanation for the pro-rich inequitable use of health services is that, persons of low SES face non-financial barriers to health service use These barriers include poorer availability of services, cultural and language gaps that may affect minorities, who constitute large percentages of low SES populations, another reason is differences in preferences.
(Korda et al. 2009)	Australia (using 2004 data)	Relative index of inequity (RII)	Yes	Income	Equal distribution for equal need	Self reported health status	Horizontal equity in health care utilization	Pro-poor inequity in general doctor use and hospital services. On the other hand, there is equality in GP use and a pro-rich inequity in specialist care. these findings are due to the absence of co-payments for doctor, hospital and GP services

Table 2: continued: summary findings for developed countries

(Van Doorslaer and Masseria 2004)	21 OECD countries (Using data from 1999 to 2002)	Concentration indices	All except USA and Mexico	Disposable income after tax	Equal distribution for equal need	Interactions of Age & sex index, self-assessed health status and comorbidity due to chronic illness	Horizontal equity in all doctor visits, Then separated into GP and specialized care	<p>Inequalities in doctor use is pro-rich in all countries, however when adjusted for “need”, general doctor use was found to be pro-rich in about half of the countries including USA and Mexico while in the other half no evidence of inequalities was found.</p> <p>In terms of GP services, the majority of countries (i.e. 15 including USA and Mexico) showed no sign of inequity and 8 countries, including UK showed pro-poor inequity and Finland showed pro-rich inequity</p> <p>For specialist care all countries found pro-rich inequity this is because the rich are covered by private health insurance in most countries</p>
(Gundgaard 2006)	Denmark (2000 to 2001 data)	Concentration indices	Yes	Household income	Equal distribution for equal need	Interaction between Age & gender and self-assessed health status	Horizontal equity in primary health care, prescription medicine, and ambulatory visits	<p>Generally, there is a pro-poor inequality, however when adjusted for need, no inequity was observed. This is because, for health care there is no co-payment needed. For specialized, health care (where there is some form of co-payment) a pro-rich distribution was found</p>

Table 2: continued: summary of findings for developed countries

(Schoen, Doty 2004)	USA, UK, Australia, new-Zealand and Canada (2001 data for all countries)	Logistic regression	All except USA	National median household income	Access to health care	Interactions between Self reported health status, chronic disease and injury	Horizontal equity	<p>Generally in the US inequalities and inequities in access to health care are found. Findings suggest that the absence of a national insurance system that provides basic coverage to all and a reliance on the voluntary purchase of private insurance with marked variations in the scope of benefits results in widespread access inequities by income.</p> <p>In the UK, there is both equality and equity in general health care utilization even in specialist care due to the restricted role of private health insurance and low out of pocket payments</p> <p>In the other 3 countries, inequalities do not extend to basic health care services that are free (i.e. with no financial barriers)</p>
(Vikum et al. 2012)	Norway (2006-2008 data)	Concentration indices	Yes	Household income	Equal access for equal need	Self reported health status	Horizontal equity in health care utilization	<p>In general, no inequalities were found</p> <p>However when adjusted for need, there were pro-rich inequities in GP as well as specialist services which is due to the differences in patient expectations and attitudes about benefits derived by using specialist care</p>

Table 2 continued: findings from developed countries

Van de Meer (1996)	Netherlands	Logistic regression	Yes	Education	Equal treatment for equal need	Self reported health status	Horizontal Inequity in health care utilization	Pro-poor inequalities in all health care services when need is adjusted for, GP use remains pro-poor but specialist care becomes pro-rich. Attitude differences between socioeconomic groups in seeking specialist medical attention are the reason for the pro-rich distribution.
(Van der Heyden et al. 2003)	Belgium (Using 1997 data)	Logistic regression	Yes	Education level and household income	Equal use for equal need	Interaction between chronic illness, functional limitation and self-assessed health status	Horizontal equity in health services	Pro-poor inequalities in primary health care are found. When adjusted for need, no inequities are found. For specialized care, pro-rich inequalities are found. Factors like the awareness of available specialist services, perception over one's own health and the availability of specialists, determine the observed differences

Table 2 continued: summary of findings from developed countries

(Finkelstein 2001)	Canada (Ontario) (Using 1995 data)	Generalized regression	Yes	Income	Equal use for equal need	Self assessed health status	Equity in access to physician and specialized care	Pro-rich inequalities in physician use and when adjusted for need, no evidence of inequity is found.
(McIsaac, et al. 1997)	Canada	Logistic regression	yes	Income	Equal use for equal need	Self perceived health status	Equity in health care utilization	No inequities in primary care, due to the fact that there are no financial barriers but pro-rich inequities in specialist care is found due to differences in attitudes about benefits derived by using specialist care

Empirical findings

Developed countries

Mixed results about inequality/inequity in health care utilization are obtained from developed countries. Most of these studies looked at inequalities/inequities in health care utilization across various types and levels of care. Majority of these revealed that the most advantaged individuals utilize more specialist health care services than their less prosperous counterparts (Schoen and Doty 2004, Van Doorslaer and Masseria 2004, Van der Heyden et al. 2003, Van Der Meer et al. 1996). However, equitable use of specialist care was also found in the UK (Schoen and Doty 2004). With respect to primary health care utilization, it was largely equitably distributed in a number of studies (Schoen and Doty 2004, Vikum et al. 2012, McIsaac et al. 1997, Van Doorslaer and Maseria 2004). Conversely, pro-poor utilization of primary health is also found in Taiwan, Australia, Netherlands and Belgium (Lu et al. 2007, Van der Heyden et al. 2003, Korda et al. 2009). Additionally, Schoen and Doty (2004) in the analysis of four developed countries found pro-rich inequities in primary health care use in USA. Similar results were found in Finland (Van Doorslaer and Masseria 2004). These mixed findings could be explained by the fact that some countries have attained universal coverage while others have not. Another possible reasons could be that there are inequity measurement variations and different conceptualizations of health care need (Kephart and Asada 2009).

A health system is said to have attained universal coverage when it provides health care that is affordable and offers financial protection to all citizens for a specific health care benefit package when it is needed (Carrin et al. 2008). Contrary to the general belief that universal coverage systems have equitable distribution of health care, countries that have attained universal coverage exhibit some inconsistencies in findings. With respect to inequalities in utilization, some studies have shown no inequalities (Schoen and Doty 2004, Vikum et al. 2012). However, pro-poor inequalities were found in other studies (Lu et al. 2007, Gundgaard 2006, Van der Heyden et al. 2003). Also, pro-rich inequalities were found in Hong Kong (Lu et al. 2007). When need for health was taken into consideration, generally, an equitable distribution especially in primary care use was shown in a majority of studies (Lu et al. 2007, Schoen and Doty 2004, Vikum et al. 2012, Van der Heyden et al. 2003, Finkelstein 2001). But, a fair number of studies also revealed pro-rich distributions (Lu et al. 2007, Gundgaard 2006, Schoen, Doty 2004, Finkelstein 2001). Additionally, pro-poor findings

were also found in Australia and the Netherlands (Korda et al. 2009, Van Der Meer et al. 1996)

Various measures of “need” for health care are used for “need-based adjustments” in the health care inequity literature for developed countries. These measures include: age and gender indices, self-reported health status, morbidity counts and more commonly composite indices comprising at least two of the above mentioned measures. It is generally said that one’s choice of ‘need’ measurement affects the degree of inequity found and that the more comprehensive the measure of need is, the higher the chances of finding inequity in a given distribution (Van Der Meer et al. 1996, Shadmi et al. 2011). Shadmi et al. (2011), adopted two measures of need, a more comprehensive measure; the morbidity index and also used a less comprehensive measure, particularly, age and gender indices. Using the latter measure, pro-poor inequities in primary, specialist, diagnostic and hospitalization were found (Shadmi et al. 2011). Studies that defined need as self-reported health status show varying results. For example, in a Norwegian study, Vikum et al. (2012) found no evidence of inequalities in health care use and when adjusted for need, the study found pro-rich utilization of primary health care. In contrast, Finkelstein's (2001) Canadian study, observed pro-rich inequalities in general health care utilization and after ‘need’ was taken into account, the distribution of health care was equitable. Similarly, studies that used the more complex interaction measure, which include (Lu et al. (2007), Gundgaard (2006) and Van Doorslaer and Masseria (2004) found varying results. Lu et al. (2007) and Gundgaard (2006), both reveal pro-poor inequalities. Van Doorslaer and Masseria (2004) found pro-rich inequalities in Primary facility use in Finland. After adjusting for need, in general, no inequities especially for primary facilities were found in most of these studies (Lu et al. 2007, Gundgaard 2006, Schoen and Doty 2004, Van Doorslaer and Masseria 2004). Yet, pro-rich inequities were found too in Portugal, Finland and Sweden (Van Doorslaer and Masseria 2004)

As has been shown in the preceding review of articles from developed countries, mixed results are found. It has also been shown that difference in universal coverage status (i.e. those that have attained and those that have not) and the differences in how ‘need’ for health care is defined may not be behind the inconsistent findings. These countries differ in benefit policy, levels of co-payment, the existence of a Social Health Insurance scheme and the reliance on private health insurance. And these differences could possibly explain the inconsistencies in findings. The absence of patient co-payments (i.e. no financial barriers), as

expected encourages the poor to utilize health care. It is the main contributing factor to the pro-poor distribution in primary health care utilization found in South Korea, Taiwan, Israel, Australia and Canada (Lu et al. 2007, Shadmi et al. 2011). Additionally, this absence of financial barriers contributes towards an equitable distribution of primary care in Australia, UK, Norway and New Zealand (Schoen, and Doty 2004, Vikum et al. 2012). Social health insurance provides basic coverage to all (rich and poor) and therefore the presence of it in South Korea contributes towards the pro-poor inequities. On the other hand, its absence in the US has been highlighted as the main factor for the pro-rich inequities in primary, tertiary as well as specialist care (Schoen and Doty 2004). A health system's reliance on the voluntary private insurance leads to clear differences in the scope of benefits and results in extensive access inequities by income (Schoen and Doty 2004). This is typical of the US health system and this reliance together with the absence of SHI cause the outstanding pro-rich distribution (Schoen, and Doty 2004). On the other hand, countries whose health systems have a restricted role of private insurance such as the UK show equitable distributions of health care utilization (Schoen and Doty 2004). Although specialist services in countries such as Norway, Israel, Belgium and Canada are offered free of charge, they are found to be pro-rich (Vikum et al. 2012 Van der Heyden et al. 2003, Shadmi et al. 2011, McIsaac, et a. 1997). Strikingly, the main reason cited for this is that, poor people have different perceptions and attitudes (often more negative) concerning the benefits derived from using this kind of care (Vikum et al. 2012, Van der Heyden et al. 2003, Shadmi et al. 2011 McIsaac, et a. 1997, Van Der Meer et al. 1996). In addition, availability constraints in the US, Belgium and cultural barriers in Israel also contribute towards this pro-rich distribution (Shadmi et al. 2011, Van der Heyden et al. 2003, Schoen and Doty 2004).

Table 3: Summary of findings from developing countries

Study	Country (s) and (year(s) of analysis)	How inequity/inequality is measured	Has country(s) of analysis attained Universal coverage	Measure of socioeconomic status	Definition of equity	Definition of need	Study focus	Findings and Explanations
Balarajan et al. (2011)	India (2005)	Rate difference and rate ratios	No	Wealth and education	Access to health care	N/A as it focuses only on measuring inequality	Inequalities in access to maternal and child health care services to proxy utilization	Pro-rich inequalities due to high financial and availability barriers
Prinja et al. (2012)	India (2004)	Concentration curves, equity ratios and concentration indices	No	Monthly per capita consumption expenditure	Equal treatment for equal need	Episode of illness prior to study	Horizontal equity in public health care use	Pro-rich inequity at public health care facilities due to high out of pocket payments.
Zere and McIntyre 2003.	South Africa (Using 1993, 1995, 1998 data)	Concentration indices	No	Income	Equal treatment for equal need	Self reported illness	Horizontal equity in primary, and secondary facilities	Public sector primary facility use was pro-poor this was as a result of the post apartheid clinic building program and free primary services Hospital use in all years was pro-rich

Table 3 continued: findings from developing countries

(Szwarcwald et al. 2010)	Brazil (2003)	Multivariate logistic regression	No	Years of schooling	Distribution of health care according to need	Self rated health	Horizontal equity in outpatient use	Pro-rich utilization owing to the fact that richer individuals use more preventative services than do the poor, there is unequal access to health facilities, services are less available to lower SES groups and financial/human and technical resources are supply factors that influence the pro-rich utilization pattern in Brazil
Shabnam et al., 2011)	Bangladesh (2004-2007 data)	Multivariate logistic regression and concentration indices	No	Wealth index	Not defined as this is merely an inequality study	n/a as this study focuses on inequality	Inequality in utilization of health care (health care is proxied by use of delivery health care)	Pro-rich inequalities in health care. This is because poor people especially in rural areas have constrained physical access to health facilities. Religious, cultural factors and low levels of education constrain use of health care among the poor
(Makinen et al. (2000).	Burkina Faso, Guatemala (Kazakhstan (Kyrgyzstan, Paraguay South Africa, Thailand (using 1992-1997 data) and Zambia (1996)	Rate difference and rate ratios	No	Wealth and education	Access to health care	N/A as it focuses only on measuring inequality	Inequalities in access to maternal and child health care services to proxy utilization	Pro-rich inequalities due to high financial and availability barriers

Table3 continued findings from developing countries

Zere et al. (2007)	Malawi (using 1992, 2000 and 2004)	Concentration curves and concentration indices	No	Composite measure of wealth index	Equal access for equal need	Episode of illness prior to study	Vertical equity health care utilization proxied by mother and child interventions	Pro-rich inequities in the use of interventions Vertical inequities in the use of health care Presence of the inverse care law. This pro-rich distribution may be due to access constraints such as physical distance, low perceived quality and cultural barriers faced by the poor
(Cisse et al. 2007)	Abidjan -(Ivory Coast), Bamako (Mali), Darkar (Senegal) and Conakry (guinea) (using 1998-1999 data in all cities)	Concentration curves and indices	None	Consumption expenditure	Equal treatment for equal need	Self reported morbidity	Horizontal equity in health care delivery	Pro-rich distribution of health care. After adjusting for need, No inequity in Abidjan and Bamako (i.e. distribution is equitable) Dakar and Conakry: there was pro-rich inequity in the distribution due to high and regressive out of pocket payments and the absence of social health insurance
(Bonfrer et al. 2012)	14 sub-Saharan countries (1996-2008) including Zambia (2003,2007)	Concentration indices	None	Not stated in study	Not stated in study	Self reported health status and ill health index	Inequalities and inequities in maternal and general health care use	Maternal health care use is very pro-rich in all countries Pro-rich inequities in general health care use in all countries except the more developed Mauritius The study concludes pro-poor inequities are due to financial barriers as well as the unequally distributed education On the other hand Mauritius shows no inequity because financial barriers are very limited, and there is an increased supply of health care

Less developed countries

Unlike that of developed countries, literature pertaining to health care utilization equality and equity in less developed countries is quite scanty. The results obtained are somewhat consistent. Despite the commitment of developing country governments, particularly those reviewed here, to pursuing pro-poor health policies and interventions dynamically, there is large evidence of pro-rich inequalities/inequities in health care utilization (Cisse et al. 2007, Zere et al. 2007, Shabnam, et al. 2011, Szwarcwald et al. 2010). This is the case, despite defining and adopting different ways of measuring inequities/inequalities. Definitions of need for health care range from capacity to benefit to the most commonly used, self-reported illness. Regardless of how need was defined, pro-rich inequities in health care utilization were generally found, with an exception of Mauritius and Abidjan (Ivory Coast) where no evidence of inequalities were found (Cisse et al. 2007, Bonfrer et al. 2012). The above findings are based on studies that did not explore facility specific inequities. However, a study that explored facility specific inequities revealed pro-poor distribution for primary facilities and pro-rich distribution for higher-level hospital use (Zere and McIntyre 2003).

The results from developing countries indicate four main reasons for the pro-rich inequalities/ inequities. Firstly, physical inaccessibility has been highlighted as one of the main reasons for the poor-rich findings (Balarajan et al. 2011, Szwarcwald et al. 2010, Shabnam et al. 2011, Zere et al. 2007, Bonfrer et al. 2012). Health facilities are normally unequally distributed with the poor facing more difficulties in accessing care. Secondly, despite having user fees removed in the majority of these countries, out of pocket payment remains high and even regressive thereby deterring the poor from using health care (Balarajan et al. 2011, Prinja et al. 2012, Cisse et al. 2007). Thirdly, the absence of social health insurance coverage for the poor, in these countries, is likely to have substantial negative effects on health care (Balarajan et al. 2011). These countries however do not have social health insurance and this too has been highlighted as a potential cause to the inherent distribution (Balarajan et al. 2011, Cisse et al. 2007). Unequally distributed levels of education is also said to have an important bearing on unequally distributed health care usage (Shabnam et al., 2011, Bonfrer et al. 2012). Lastly, a cross-country analysis suggests that governance and the strength of health system is yet an important driver in determining differences in usage levels (Bonfrer et al. 2012). Mauritius, which is supposedly said to have better governance, exhibits equitable health care utilization (Bonfrer et al. 2012).

Characteristically, none of the less developed countries on which inequalities/inequity was assessed has attained universal coverage. When compared with developed countries that also have not attained universal coverage, a similarity of pro-rich inequalities and inequities can be observed.

Unlike studies from developed countries that focused on assessing inequalities and inequities in actual health care utilization, a good number of studies from less developed countries mainly take a much narrower focus by using specific health interventions such as maternal and child care to proxy health care utilization (Balarajan et al. 2011, Shabnam et al. 2011, Bonfrer et al. 2012, Zere et al. 2007). In contrast to developed country studies that assess both inequalities as well as inequities, some studies in less developed countries tend to focus solely on assessing inequalities in health care utilization (Balarajan et al. 2011, Makinen et al. 2000).

With regards to Zambia, studies pertaining to health care inequalities/inequities, just like the rest of the less developed countries are very scarce. Only two studies have been found – Makinen et al. (2000) and Bonfrer et al. (2012). Makinen et al. (2000) makes a cross-country assessment of eight countries, where Zambia is one of them. This study employs a narrow approach and focuses only on assessing inequality as opposed to both inequality and inequity and uses 1995 data for Zambia. This study's findings conform to the general trend and reveals pro-rich inequality. On the other hand, Bonfrer et al. (2012) examined the extent to which health care utilization was distributed according to need in 18 African countries, with Zambia inclusive. Using 2007 data for Zambia, this study revealed pro-rich socioeconomic inequalities in the general use of health care services after adjusting for need (which was measured by an ill-health index).

Discussion of Empirical findings

The literature on measuring equality/equity in health care utilization in less developed countries is scarce. The few that exist mostly reveal pro-rich inequality and inequity (Makinen et al. 2000, Schoen and Doty 2004, Shabnam et al. 2011, Bonfrer et al. 2012, Zere et al. 2007, Szwarcwald et al. 2010).

Amongst these few health care utilization inequity and inequality studies, a fair number use maternal and child health care to proxy general health care utilization (Balarajan et al. 2011, Shabnam et al. 2011, Bonfrer et al. 2012, Zere et al. 2007). Although measuring inequalities in specific health outcomes and utilization of maternal and child health care services are essential for assessing developing countries' health system, they only represent a small component of the health system. Therefore, they only shed light on a few aspects of the great challenges that face the entire system.

This study aims to fill the gap in information in less developed countries by measuring socioeconomic inequalities in health care utilization in Zambia further than the more often previously observed inequalities that use maternal and child health care services as a proxy for general utilization.

The two studies analyzing inequality/inequity in health care utilization¹¹ that have Zambia as one of the countries of analysis are based on 1995 and 2007 data (Makinen et al. 2000, Bonfrer et al. 2012). Since the country has recently undergone more health reforms, such as building of more primary health facilities in rural communities more recent results are required to examine the performance of the Zambian health system to reductions in inequalities and inequities (University of Zambia Department of Economics, Ministry of Health, TARSC 2011)

Some studies from developing countries, and one out of two for the Zambian studies, explicitly focused on measuring inequalities in health care utilization and not inequities (Balarajan et al. 2011, Makinen et al. 2000). Equality in health care utilization means equal distribution of health care across socioeconomic groups (Braveman and Gruskin 2003). Admittedly, different authors have acknowledged that seeking to equalize health care use across groups does not guarantee fairness. This is because different socioeconomic groups may have different needs (Braveman and Gruskin 2003, Glied and Smith 2011). Therefore, examining inequalities alone will not serve an instrumental purpose in that they will not provide adequate information for meaningful policy recommendations. This study seeks therefore, to add onto the sparse literature that explores both inequalities and inequity in health care utilization.

Most studies from less developed countries did not disaggregate by facility type.

¹¹ These two studies specifically used health care itself rather than the commonly used maternal and child health outcomes to proxy health care utilization.

Disaggregating by facility type offers a clearer picture of the inequity and enables the determination of the source of inequity. This study disaggregates by facility type.

To summarize, this study aims to:

- Fill the knowledge gap that exists in less developed countries and specifically in Zambia beyond the more commonly assessed inequalities/inequities in health outcomes.
- To disaggregate the analysis by facility type; an act not used in most developed country studies
- To provide more recent evidence for Zambia so as to check if previously proclaimed inequities have persisted even after introducing more health reforms which include among others building of more primary health facilities in rural areas.
- To provide a single country analysis beyond the cross country analyses that included Zambia

University of Cape Town

References

- Acheson, D. 2000, "Health inequalities impact assessment", *Bulletin of the World Health Organization*, vol. 78, no. 1, pp. 75-76.
- Acheson, R.M. 1978, "The definition and identification of need for health care.", *Journal of epidemiology and community health*, vol. 32, no. 1, pp. 10-15.
- Aday, L.A., Anderson. R., Fleming, G.V., 1980, *Health care in the US: Equitable to whom?* Sage Publications, Beverly Hills, CA.
- Almqvist, A. 2010, "socioeconomic inequity in Zambian children's health status—differences between rural and urban areas." Master's Thesis, Lund University, Department of Economics
- Anand, P. & Dolan, P. 2005, "Equity, capabilities and health.", *Social science & medicine*, .
- Ataguba, J.E. & McIntyre, D. 2012, "Paying for and receiving benefits from health services in South Africa: is the health system equitable?", *Health policy and planning*, vol. 27, no. suppl 1, pp. i35-i45.
- Balarajan, Y., Selvaraj, S. & Subramanian, S. 2011, "Health care and equity in India", *Lancet*, vol. 377, no. 9764, pp. 505.
- Barry, B. 1990, *Political Argument: a reissue with a new introduction*, University of California Press.
- Barry, B. 1965, *Political argument*, Routledge and Kegan Paul, London.
- Bonfrer, I., Poel, E., Grimm, M. & Doorslaer, E.K.A. 2012, *Does health care utilization match needs in Africa? Challenging conventional needs measurement*, .
- Braveman, P. & Gruskin, S. 2003, "Defining equity in health", *Journal of epidemiology and community health*, vol. 57, no. 4, pp. 254-258.
- Braveman, P.A., Cubbin, C., Egerter, S., Chideya, S., Marchi, K.S., Metzler, M. & Posner, S. 2005, "Socioeconomic status in health research", *JAMA: the journal of the American Medical Association*, vol. 294, no. 22, pp. 2879-2888.
- Burt, J.A. 2010 'Equity, need and access in health care: a mixed methods investigation of specialist palliative care use in relation to age'. Doctoral thesis, UCL (University College London).
- Carrin, G., Mathauer, I., Xu, K. & Evans, D.B. 2008, "Universal coverage of health services: tailoring its implementation", *Bulletin of the World Health Organization*, vol. 86, no. 11, pp. 857-863.
- Chang, W. 2002, "The meaning and goals of equity in health", *Journal of epidemiology and community health*, vol. 56, no. 7, pp. 488-491.

- Cisse, B., Luchini, S. & Moatti, J.P. 2007, "Progressivity and horizontal equity in health care finance and delivery: What about Africa?", *Health Policy*, vol. 80, no. 1, pp. 51-68.
- Collins, E. & Klein, R. 1980, "Equity and the NHS: self-reported morbidity, access, and primary care.", *British medical journal*, vol. 281, no. 6248, pp. 1111-1115.
- Culyer, A.J. 2001, "Equity-some theory and its policy implications", *Journal of medical ethics*, vol. 27, no. 4, pp. 275-283.
- Culyer, A.J. 1976, *Need and the National Health Service: economics and social choice*, Rowman and Littlefield (Totowa, N.J.)
- Culyer, A.J., Van Doorslaer, E. & Wagstaff, A. 1992, "Access, utilisation and equity: a further comment", *Journal of health economics*, vol. 11, no. 2, pp. 207-210.
- Culyer, A.J. & Wagstaff, A. 1993, "Equity and equality in health and health care", *Journal of health economics*, vol. 12, no. 4, pp. 431-457.
- Culyer, T.J. & Wagstaff, A. 1992, "Need, equity and equality in health and health care", *Centre for Health Economics, University of York Working Papers*, .
- Cutler, D.M., Lleras-Muney, A. & Vogl, T. 2008, *Socioeconomic status and health: dimensions and mechanisms*, .
- Daniels, N. 1985, *just health care*, Cambridge University Press.
- Fein, R. 1972, "On achieving access and equity in health care", *The Milbank Memorial Fund quarterly*, vol. 50, no. 4, pp. 157-190.
- Finkelstein, M.M. 2001, "Do factors other than need determine utilization of physicians' services in Ontario?", *Canadian Medical Association journal*, vol. 165, no. 5, pp. 565-570.
- Garcia, L.P., Höfelmann, D.A. & Facchini, L.A. 2010, "Self-rated health and working conditions among workers from primary health care centers in Brazil", *Cadernos de Saúde Pública*, vol. 26, no. 5, pp. 971-980.
- Gillion, C. & Hemming, R. 1985, "Social expenditure in the United Kingdom in a comparative context: trends, explanations and projections", *The Future of Welfare*, , pp. 22-36.
- Glied, S. & Smith, P.C. 2011, *The Oxford Handbook of Health Economics*, OUP Oxford.
- Graham, H. 2004, "Social determinants and their unequal distribution: clarifying policy understandings", *Milbank Quarterly*, vol. 82, no. 1, pp. 101-124.
- Gravelle, H., Morris, S. & Sutton, M. 2006, "18 Economic studies of equity in the consumption of health care", *The Elgar Companion to Health Economics*, , pp. 193.

- Green, R.M. 2001, "Access to healthcare: going beyond fair equality of opportunity", *American Journal of Bioethics*, vol. 1, no. 2, pp. 22-23.
- Gundgaard, J. 2006, "Income-related inequality in utilization of health services in Denmark: evidence from Funen County", *Scandinavian Journal of Public Health*, vol. 34, no. 5, pp. 462-471.
- Gwatkin, D.R., Bhuiya, A. & Victora, C.G. 2004, "Making health systems more equitable", *Lancet*, vol.
- Hurley, J. "An overview of the normative economics of the health sector" in handbook of health economics, volume 1, editors Culyer, A., J. and Newhouse, J. 2000 Elsevier science 364, no. 9441, pp. 1273-1280.
- Illsley, Raymond and Le Grand, Julian (1985) *Measurement of inequality in health*. WSP012. Centre for Analysis of Social Exclusion, London School of Economics and Political Science, London, UK.
- Kephart, G. & Asada, Y. 2009, "Need-based resource allocation: different need indicators, different results?", *BMC Health Services Research*, vol. 9, no. 1, pp. 122.
- Korda, R.J., Banks, E., Clements, M.S. & Young, A.F. 2009, "Is inequity undermining Australia's 'universal' health care system? Socio-economic inequalities in the use of specialist medical and non-medical ambulatory health care", *Australian and New Zealand Journal of Public Health*, vol. 33, no. 5, pp. 458-465.
- Le Grand, J. 1982, *The strategy of equality: redistribution and the social services*, Allen & Unwin.
- LeGrand, J. 1978, "The distribution of public expenditure: the case of health care", *Economica*, , pp. 125-142.
- Lu, J.R., Leung, G.M., Kwon, S., Tin, K.Y.K., Van Doorslaer, E. & O'Donnell, O. 2007, "Horizontal equity in health care utilization evidence from three high-income Asian economies", *Social science & medicine*, vol. 64, no. 1, pp. 199-212.
- Macinko, J.A. & Starfield, B. 2002, "Annotated bibliography on equity in health, 1980-2001", *International Journal for Equity in Health*, vol. 1, no. 1, pp. 1.
- Makinen, M., Waters, H., Rauch, M., Almagambetova, N., Bitran, R., Gilson, L., McIntyre, D., Pannarunothai, S., Prieto, A.L. & Ubilla, G. 2000, "Inequalities in health care use and expenditures: empirical data from eight developing countries and countries in transition", *Bulletin of the World Health Organization*, vol. 78, no. 1, pp. 55-65.
- Mannesh, O. 2005, "Theories of Equity in health care, implications from developed and developing countries", *Iranian Journal of Public Health*, vol. 34.
- McIntyre, D., Thiede, M. & Birch, S. 2009, "Access as a policy-relevant concept in low-and middle-income countries", *Health Econ Policy Law*, vol. 4, no. Pt 2, pp. 179-193.

- McIsaac, W., Goel, V. & Naylor, D. 1997, "Socio-economic status and visits to physicians by adults in Ontario, Canada." *Journal of health services research & policy*, vol. 2, no. 2, pp. 94.
- Miller, D. 1976, *Social Justice*, Clarendon Press, Oxford.
- Ministry of Finance and National Planning 2010, *Vision 2030*, Government of the Republic of Zambia, Lusaka.
- Mooney, G., Hall, J., Donaldson, C. & Gerard, K. 1991, "Utilisation as a measure of equity: weighing heat?" *Journal of health economics*, vol. 10, no. 4, pp. 475-480.
- Mooney, G. & Jan, S. 1997, "Vertical equity: weighting outcomes? or establishing procedures?", *Health Policy*, vol. 39, no. 1, pp. 79-87.
- Mooney, G.H. 1983, "Equity in health care: confronting the confusion", *Effective health care*, vol. 1, no. 4, pp. 179-185.
- Morris, S., Sutton, M. & Gravelle, H. 2005, "Inequity and inequality in the use of health care in England: an empirical investigation", *Social Science and Medicine*, vol. 60, no. 6, pp. 1251-1266.
- O'Donnell, O. & Propper, C. 1991, "Equity and the distribution of UK National Health Service resources", *Journal of health economics*, vol. 10, no. 1, pp. 1-19.
- O'Donnell, O., Van Doorslaer, E., Wagstaff, A. & Lindelow, M. 2008, *Analyzing health equity using household survey data: a guide to techniques and their implementation*, World Bank Publications.
- Pamuk, E.R. 1985, "Social class inequality in mortality from 1921 to 1972 in England and Wales", *Population studies*, vol. 39, no. 1, pp. 17-31.
- Prinja, S., Kanavos, P. & Kumar, R. 2012, "Health care inequities in north India: Role of public sector in universalizing health care", *The Indian journal of medical research*, vol. 136, no. 3, pp. 421.
- Puffer, F. 1986, "Access to primary health care: a comparison of the US and the UK", *Journal of social policy*, vol. 15, no. 3, pp. 293-313.
- Rawls, J. 1999, *"A Theory of Justice, 1971"*, Harvard UP.
- Rice, T.H. & Unruh, L. 1998, *The economics of health reconsidered*, Health Administration Press Chicago^ eIL IL.
- Schoen, C. & Doty, M.M. 2004, "Inequities in access to medical care in five countries: findings from the 2001 Commonwealth Fund International Health Policy Survey", *Health Policy*, vol. 67, no. 3, pp. 309-322.
- Sen, A. 1992, *Inequality reexamined*, Clarendon Press.

- Sen, A. 1980, "Equality of what?", *Tanner lectures on human values*, vol. 1, pp. 195-220.
- Shabnam, J., Gifford, M. & Dalal, K. 2011, "Socioeconomic inequalities in the use of delivery care services in Bangladesh: a comparative study between 2004 and 2007", *Health*, vol. 3, no. 12, pp. 762-771.
- Shadmi, E., Balicer, R.D., Kinder, K., Abrams, C. & Weiner, J.P. 2011, "Assessing socioeconomic health care utilization inequity in Israel: impact of alternative approaches to morbidity adjustment", *BMC public health*, vol. 11, no. 1, pp. 609.
- Smith, S. 2009, "Equity in Health Care: A View from the Irish Health Care System", *An Adelaide Health Policy Brief, Dublin, Adelaide Hospital Society*, .
- Sutton, M. 2002, "Vertical and horizontal aspects of socio-economic inequity in general practitioner contacts in Scotland", *Health Economics*, vol. 11, no. 6, pp. 537-549.
- Szwarcwald, C.L., Souza-Júnior, P.R.B. & Damacena, G.N. 2010, "Socioeconomic inequalities in the use of outpatient services in Brazil according to health care need: evidence from the World Health Survey", *BMC health services research*, vol. 10, no. 1, pp. 217.
- Thiede, M., Akweongo, P., McIntyre, D. & Mooney, G. 2007, "Exploring the dimensions of access.", *The economics of health equity*, , pp. 103-123.
- Tobin, J. 1970, "On limiting the domain of inequality", *Journal of Law and Economics*, , pp. 263-277.
- UNDP 1993, *Human Development Report*, Oxford University Press, New York.
- Van de Poel, E., Hosseinpoor, A.R., Speybroeck, N., Van Ourti, T. & Vega, J. 2008, "Socioeconomic inequality in malnutrition in developing countries", *Bulletin of the World Health Organization*, vol. 86, no. 4, pp. 282-291.
- Van der Heyden, J., Demarest, S., Tafforeau, J. & Van Oyen, H. 2003, "Socio-economic differences in the utilisation of health services in Belgium", *Health policy*, vol. 65, no. 2, pp. 153-165.
- Van Der Hoog, M., 2010. Measuring Equity in Health Care Delivery: A new Method Based on the Concept of Aristotelian Equality. [Online] Netspar Available at: <http://arno.uvt.nl> [Accessed 23rd December 2012].
- Van Der Meer, J.B.W., Van Den Bos, J. & Mackenbach, J.P. 1996, "Socioeconomic differences in the utilization of health services in a Dutch population: the contribution of health status", *Health Policy*, vol. 37, no. 1, pp. 1-18.
- Van Doorslaer, E. & Masseria, C. 2004, *Income-related inequality in the use of medical care in 21 OECD countries*, OECD.

- Van Doorslaer, E., Wagstaff, A., Van Der Burg, H., Christiansen, T., De Graeve, D., Duchesne, I., Gerdtham, U.G., Gerfin, M., Geurts, J. & Gross, L. 2000, "Equity in the delivery of health care in Europe and the US.", *Journal of health economics*, vol. 19, no. 5, pp. 553.
- Vikum, E., Krokstad, S., Westin, S., Akhavan, S., Soeung, S., Grundy, J., Sokhom, H., Chang Blanc, D., Thor, R. & Dallolio, L. 2012, "Socioeconomic inequalities in health care utilisation in Norway: the population-based HUNT3 survey", *International Journal for Equity in Health*, vol. 11, no. 1, pp. 48.
- Wagstaff, A. 2000, "Socioeconomic inequalities in child mortality: comparisons across nine developing countries", *Bulletin of the World Health Organization*, vol. 78, no. 1, pp. 19-29.
- Wagstaff, A., Doorslaer, E.K.A. & Paci, P. 1989, "Equity in the finance and delivery of health care: some tentative cross-country comparisons", *Oxford Review of Economic Policy*, vol. 5, no. 1, pp. 89-112.
- Wagstaff, A. & Van Doorslaer, E. 2000, "Equity in health care finance and delivery", *Handbook of health economics*, vol. 1, pp. 1803-1862.
- Wagstaff, A. & van Doorslaer, E. 2000, "Measuring and testing for inequity in the delivery of health care", *Journal of Human Resources*, , pp. 716-733.
- Wagstaff, A., Van Doorslaer, E. & Paci, P. 1991, "On the measurement of horizontal inequity in the delivery of health care", *Journal of health economics*, vol. 10, no. 2, pp. 169-205.
- Whitehead, M. 1992, "The concepts and principles of equity and health", *International journal of health services*, vol. 22, no. 3, pp. 429-445.
- Wilkinson, R.G. 1986, "Socio-economic differences in mortality: interpreting the data on their size and trends", *Class and health: Research and longitudinal data*, , pp. 1-20.
- Williams, A. 1993, "Equity in health care: the role of ideology", *Equity in the finance and delivey of health care: an international perspective*, Oxford University Press, Oxford, , pp. 287-298.
- Williams, A. 1981, *Welfare economics and health status measurement*, University of York.
- Williams, A. 1974, "Need as a demand concept (with special reference to health)", *Economic problems and social goals*. London: Martin Robertson, , pp. 60-76.
- Williams, B. 1962, "The idea of equality".
- Williams, R.F.G. & Doessel, D.P. 2006, "Measuring inequality: tools and an illustration", *International journal for equity in health*, vol. 5, no. 1, pp. 5.
- Zere E, McIntyre D. Equity in self-reported adult illness and use of health service in South Africa: inter-temporal comparison. *Journal of Health, Population Nutrition* 2003;21(3):205–15.

Zere, E., Moeti, M., Kirigia, J., Mwase, T. & Kataika, E. 2007 "Equity in health and healthcare in Malawi: analysis of trends", *BMC Public Health*, vol. 7, no. 1, pp. 78.

Part C: Journal Manuscript

Proposed journal: International Journal for equity in Health¹²

University of Cape Town

¹² Instructions for authors appear in the appendix

Socioeconomic inequalities in Zambia's public health care delivery system

Jane Phiri¹³

Abstract

Background: Internationally, inequities in health care utilization have received considerable attention because of the well-known association between health and economic growth. Previous studies and surveys have revealed pro-rich inequities in health care utilization in the country. However, these studies are based on old data sets. This study seeks therefore, to assess if socioeconomic related inequalities/inequities in health service utilization in Zambia still persist.

Methods: This study uses data from the 2010 Zambia Living Conditions and Monitoring Survey (LCMS). To investigate inequalities, concentration curves and concentrations indices are used. To investigate inequity we compute a horizontal equity index: an index of inequity across socioeconomic status groups, based on standardizing health service utilization for health care need. Horizontal equity requires that individuals with equal need ought to be treated the same.

Results: There is evidence of pro-poor inequality in public primary health care utilization but pro-rich inequality in hospital use. After controlling for need, the pro-poor distribution is maintained at primary facilities and similarly a pro-rich distribution at hospitals is revealed. On the other hand, pro-rich inequity is observed when all the public facilities are combined.

Conclusion: While further research that explores possible reasons for the findings in the study is necessary, the pro-poor distributions of public primary health facilities use, calls for initiatives that focus on primary facilities that serve the poor and where possible, attempts should be made to ensure a pro-poor distribution at the hospital level. This should be in line with need for care.

¹³Address: Health Economics Unit, School of Public Health and Family Medicine, University of Cape Town, Observatory, 7925, South Africa . Correspondence: jchiphiri@yahoo.com

Key words: equity, inequity, equality, inequality, health care utilization, health care delivery, access

Introduction

Based on a compelling social justice argument and also on the basis of the well-known association between health and economic growth, inequities in health care utilization have spurred a great deal of interest among governments, decision makers and international organizations [1-3]. Moreover, these inequities can contribute to and intensify disparities in health and quality of life [4,5]. They may worsen the health-poverty trap^a thereby hindering economic development [1,5]. Despite this being the case, there is evidence of inequities in the utilization of health services as well as the presence of the inverse care law in many developing countries [6-9]. Inverse care law refers to a situation where the poor bear the highest burden of ill health and yet take delivery of lower health services than do their richer and in-better health counterparts [10]. There is therefore, need for pro-poor health initiatives in developing countries, especially in Africa where socioeconomic inequalities are high [11,12].

In Zambia, equity in the distribution of health care utilization has been recognized as an important matter in developing public policies aimed at reducing poverty and fostering development. For example, in Zambia's Vision 2030, the government through the Ministry of Health (MoH) has acknowledged the right to equality in access to and utilization of good quality health care for all Zambians regardless of socioeconomic status [13]. This issue is particularly pertinent in a developing country like Zambia where socioeconomic inequality is quite high and previous studies show the existence of the inverse care law [14,15].

In 1991, as part of the International Monetary Funds' policy recommendations, Zambia, introduced Structural Adjustment Programs (SAPs), which included among others, introduction of user fees for health services and reduction in public expenditure on health [16]. These policies were aimed at reducing macroeconomic stagnation [16,17]. However, evidence shows that the poor were greatly affected by the initiation of these programs as it led to a decrease in health service utilization amongst them [16,18,19]. Socioeconomic health disparities were observed with the poor facing worse health than their richer counterparts- the socioeconomic gradient [15]. The socioeconomic gradient refers to the negative association between socioeconomic status and health [9]. In response to these negative effects, the

Zambian government initiated pro-poor policies and initiatives that aimed at promoting equity and efficiency in health service provision, increasing health service utilization rates especially among the poor, improving health outcomes, responding to the people's needs whilst at the same time guaranteeing financial risk protection [20]. To this effect, in 1995 the entire health system was decentralized and user fees were abolished in all rural facilities in 2006 [21,22]. In the following years, this was rolled out to all primary facilities through out the country [22].

In light of the pro-poor initiatives, Zambia's health care system recorded some improvements. Generally, some health indicators improved and health service utilization increased especially at primary facilities [22,23]. Despite these improvements, surveys conducted have revealed the persistence of socioeconomic disparities in health outcomes (i.e. continued presence of the socioeconomic gradient), and unequally distributed barriers in access to and utilization of health services, disfavoring the poor [14,15].

It is generally accepted that policies that seek to promote equity in utilization of health services offer good potential of moderating/reducing underlying health differences and, over the longer term, providing more equal opportunities for health and productivity [24]. An important step towards achieving this, involves generating evidence on the presence and the extent of inequality currently present [25]. Most socioeconomic inequality studies undertaken in Zambia specifically focus on health outcomes and specific health interventions, [13,26,27]. Although these kinds of studies provide important information for health systems appraisal, they only represent a small element of the health system, consequently, merely touching on a few aspects of the great challenges facing the entire system. Only two previous studies in Zambia have explicitly explored inequalities/inequities in health care utilization and both revealed pro-rich inequalities [13,28]. However, both these studies were undertaken not too long after the pro-poor reforms were introduced. In addition, neither of the two disaggregated their analyses by facility level. This study as a result, seeks to provide more recent evidence and to determine whether amidst more recent health reforms inequities still persist. Also, this study disaggregates by facility levels and therefore offers a clearer picture of inequities.

Equality in the delivery of health care means the absence of differences in utilization by socioeconomic status [29]. Equity in the delivery of health service occurs when utilization is equal for everyone after considering the differences in needs (which in this case are measured using self-reported illness) [30]. The general idea is that utilization of health services should

roughly be the same for everyone regardless of socioeconomic status. Equity in health care delivery has two dimensions to it: horizontal and vertical equity. While horizontal equity means equal treatment for individuals with equal need, vertical equity means unequal treatment for individuals with different health need [31]. This study uses the horizontal equity dimension that is most commonly used in similar studies.

This study analyses whether there still are socioeconomic inequalities and inequities in the utilization of health care service in Zambia. Specifically focusing on public health care utilization.

Methods

Data source

The data used in this study is obtained from the 2010 Zambian Living Conditions Monitoring Survey (LCMS), which is popularly known as the Indicator Monitoring Survey. This is a nationally representative survey that aims to monitor the levels of development and poverty in the country [32]. Conducted by the Central Statistical Office (CSO) between January and April of 2010, this survey used a two-staged stratified cluster sampling strategy. The first step involved the selection of 1000 Standard Enumeration Areas (SEAs) with Probability Proportional to Estimated Size (PPES) within the respective strata [32]. This was followed by the systematic selection of approximately 20,000 households from an enumeration area register, which comprised both rural and urban locations, and from all the nine provinces [32]. In terms of content, the survey includes a wide range of information including information on the health, living conditions of individuals and households, economic activities as well as demographic characteristics.

Measuring socioeconomic status

The choice of socioeconomic status for this study is consumption expenditure. Consumption expenditure is considered a more reliable measure as compared to both income and asset index. Unlike income, it is less variable, less susceptible to being under-reported and unlike asset index, offers a better reflection of current living conditions [2,33]. Despite having its own shortcomings consumption expenditure is a better method to use in situations where an organized labor market is lacking [2]. Household consumption expenditure was assessed for

the following categories; food, transport, utilities, housing, beverages and tobacco, durable and non-durable household goods, household produced commodities and frequently purchased services. Questions captured different recall periods; therefore, conversion factors were applied to come up with a common reference period. In this study, household expenditure is adjusted for household size and composition [33,34] using an adult equivalent scale (E), which is obtained as follows:

$$E=(A+\alpha K)^\beta \quad (1)$$

where A= number of adults (at least 16 years old), K= number of children (below 16 years), α is child adjustment which is a measure of the weight accorded to children relative to adults [35]. β is elasticity, capturing economies of scale [34]. Various authors have recognized the subjectivity of identifying α and β (i.e. equivalence scale coefficients) especially for developing countries [34]. Authors therefore recommend values in the range of 0.3 to 0.5 for α and 0.75 to 1.0 for β because food accounts for a large proportion of total consumption consequently; economies of scale are relatively limited [34]. Following recommendation α and β are in this study set equal to 0.5 and 0.75 respectively (see [34-36]). For validity sake, a simulation of the analysis will be performed using the extreme values of 0.3 and 1.0 for α and β respectively.

Measuring Need

The variable 'need' used in this study is based on self-assessed illness. This represents respondents who reported being ill and/or injured in the 2 weeks prior to the survey and/or declared being continuously ill in the previous three months and/or facing difficulties in performing normal tasks. Merely relying on an individual's declaration of their illness is considered by many to be an ineffective measure of need for health care because it is a very subjective measure with a tendency for being under-reported among the poor [4]. Despite involving individual's subjective assessments, functional limitation and being ill for a long time, are said to be good predictors of actual illness and consequently need for health care [37]. This is so because, when verified medically, these measures are normally found to be accurate [37].

Measuring Utilization

Utilization is measured by self-reported use/visit of public health facilities. Respondents were asked to state whether they visited a health facility or not and which kind of facility they visited if at all they did. Gender differences in health care utilization are well established. It is commonly revealed in studies that deal with morbidity/illness and health care utilization that women generally report more ill health symptoms, report worse health status and are also more likely to seek medical attention [9]. Further, older persons are more susceptible to being ill and ideally ought to use more health care services [9]. In addition both age and sex are related to socioeconomic status [2]. This means that age and sex are confounding variables. It is for this reason that health care utilization in this study is adjusted for age and sex. Measuring inequities in health care utilization in the Netherlands, Van de Meer also standardizes health care utilization by age and sex [2]. The reason behind this standardization is not to build a casual, or structural, model of health care utilization determination. However, the analysis remains descriptive, but a more distinguished relationship between a health care utilization variable and socioeconomic status is established [33]. Such adjustment could be done using the direct or indirect standardization. This study uses indirect standardization because standardizing using the direct approach always requires the use of grouped data [33]. Additionally, it is not considered to be a very useful approach because the resulting directly standardized health variable that is estimated is highly dependent on the number of socioeconomic groups [33]. When employing the indirect standardization method, the first step involves the estimation of the predicated health care utilization value h_i^X (one that incorporates age and sex). h_i^X is obtained as follows [33]:

$$h_i^X = \hat{\alpha} + \sum \beta_j x_{ij} \quad (2)$$

with x_{ij} being the standardizing variable (i.e. age and sex).

Finally, age and sex standardized health care utilization h_i^{IS} is obtained using the following process [34]:

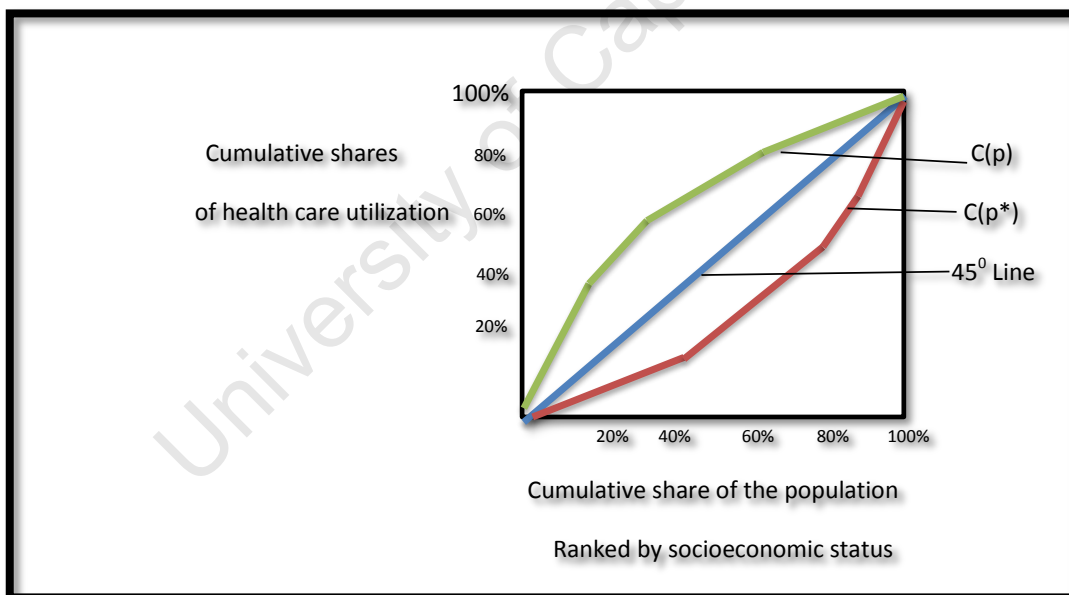
$$h_i^{IS} = h_i - h_i^X + \mu \quad (3)$$

The indirectly standardized health care utilization variable h_i^{IS} is obtained using h_i (the actual utilization value), h_i^X (the predicted value that incorporated age and sex which was obtained in equation (2)) and μ (the mean of the health care utilization variable).

Measuring inequality in health care utilization

This study uses concentration curves to graphically examine the socioeconomic pro-poor/pro-richness of the distribution of health care utilization. A concentration curve plots the cumulative share of the health variable (which in this case is age-sex standardized, health care utilization) against the cumulative shares of households in the population ranked from poorest to richest [38,39]. Figure 1 is an example of concentration curve for health care utilization. If the concentration curve $C(p)$ falls above the 45 degree line (i.e. the line of equality) then health care utilization is concentrated among the poor whilst if the concentration curve $C(p^*)$ falls below the line of equality then the opposite is the case [39]. Further, if the concentration curve matches with the line of equality then health care utilization is equally distributed across groups.

Figure 1: concentration curve for health care utilization



Formal statistical tests of dominance between concentration curves and the line of equality will be obtained^b [33]. This is because concentration curves are estimated from survey data and there is a possibility of sampling variability and therefore comparing of curves is insufficient for establishing statistical dominance [33].

The study also computes concentration indices (CIs) to quantify the extent of inequality. A concentration index measures the extent of the inequality in the health care utilization that is

systematically related with socioeconomic status [40]. It takes on values between -1 (when the population's health care utilization is concentrated among the poor) and $+1$ (when the population's health care utilization is concentrated among the rich).

The concentration index (CI) has been defined as twice the area between the concentration curve, say $C(p)$, and the line of equality and is estimated as two times the covariance between health care utilization and the fractional rank [33]:

$$CI = \frac{2}{\mu} cov(h, r) \quad (4)$$

where h is health care utilization and r is the fractional rank.

The age-sex standardized CIs and their standard errors are to be more conveniently obtained using the ordinary least square (OLS) regression [39]:

$$2 \sigma_r^2 (h_i^{IS} / \mu^{IS}) = \alpha_0 + \alpha_1 r_i + \varepsilon_i \quad (5)$$

Where h_i^{IS} is indirectly standardized health care utilization, μ^{IS} is the mean of h_i^{IS} , σ_r^2 is the variance of r_i , where r_i is the weighted relative fractional rank of the i^{th} household in the consumption expenditure distribution. α_1 the OLS estimate of the slope coefficient gives the standardized concentration index (CI_{IS}) estimate.

It has been revealed that the lower and upper limits of the concentration index for a dichotomous variable are not -1 and 1 respectively but lies between $\mu - 1$ and $1 - \mu$, where μ is the mean of variable [39]. There has been some debate concerning how best to normalize this. Wagstaff recommends a normalization process that involves dividing by the concentration index by $1 - \mu$. Erreygers, criticizes Wagstaff's method on a number of respects including the fact that it does not possess the mirror effect property (i.e. inequality in use being equal to inequality in non-use) [39]. Erreygers further criticizes Wagsataff's approach and suggests that it "blow(s) up the levels of measured inequality for distributions with either high or low means" [41 p.3]. However, Wagstaff approach exhibits little variation between the normalized index and the ordinary index and the ordering of inequality also remains the same for both measures [41]. In addition, Erreygers normalized concentration index can be obtained by scaling the Wagstaff's normalized index [41]. Therefore in this study, the

Wagstaff's normalization is used.

Since health care utilization used in this study is a dichotomous variable, normalization of the concentration index is in order. Following Wagstaff's normalization, normalized concentration indices (C_H) are computed as follows [40]:

$$C_H = CI_{IS} / (1 - \mu^{IS}) \quad (6)$$

with CI_{IS} and μ^{IS} as previously defined.

Measuring Inequity in utilization

The concept of horizontal equity in the health care utilization context requires that persons with equal need, use health care services equally [31]. Based on this principle, this study measures the degree of inequity in health care delivery using a common approach previously proposed [39]. Under this approach, comparing each socioeconomic group's share of need with its share of health service use assesses the extent of horizontal inequity. The index of inequity (HI) that is used for this purpose is defined as two times the area between the need and health service use concentration curves [39]. A positive HI value signifies a pro-rich inequity and a negative value signifies a pro-poor inequity and a value of zero shows that health care utilization and need are proportionally distributed across the socioeconomic distribution [6]. The horizontal equity index is mathematically obtained by subtracting the concentration index for need from the concentration index of health care utilization.

Analogous to why and how health care utilization was standardized for sex and age, need is also standardized. With the exact same analogy, as that of equation (2) and (3), and by replacing the health care utilization variable with the need variable, an age-sex standardized need measure is obtained. The age-sex standardized concentration index for need (CI_N) and the normalized need concentration index (C_N) are obtained in a similar way.

The normalized/age-sex standardized horizontal equity index is numerically computed as the difference between the normalized health service utilization index C_H and the normalized need concentration index C_N .

$$HI = C_H - C_N \quad (9)$$

Results

Descriptive statistics

Table 1: Distribution of need variables and facility use stratified by socioeconomic quintiles

Variable	Q1	Q2	Q3	Q4	Q5	Average
	Percent (%)	Percent (%)	Percent (%)	Percent (%)	Percent (%)	Percent (%)
Need variables						
Ill/injured	21.79	22.6	19.93	18.82	16.75	87.32
Continuous illness	23	22.26	19.15	21.45	14.14	9.53
Functional incapability	16.2	20.69	25.2	23.77	14.14	3.14
Need (ill/injured, continuous illness, Functional incapability)	21.8	22.5	19.85	19	16.6	
Facility utilization						
Health centers	35.58	31.9	19.02	7.96	5.52	2.27
Clinics	24.82	23.92	21.63	18.88	10.75	55.63
Hospitals	15	20.93	23.28	21.48	19.34	42.1
All government facilities	20.93	22.84	22.27	19.70	14.25	

Table 1 provides the socioeconomic quintile stratified descriptive statistics of the sample. In total, 19398 households and resultantly 102,882 individuals were used in the analysis. Overall, about 13% of the population reported needing health care. Table 1 suggests that

higher proportions of poorer quintiles reported being ill/injured and/or having been continuously ill for 3 months prior to the interview and/or facing limitations in usual activities. This conforms to the generally held opinion that the poor have disproportionately larger health care need. Illness/injuries contributed about 87% to total health care need while continuous illness and functional limitation contributed 9% and 3% respectively. As seen from the table there were marked differences in average facility utilization. Clinics accounted for 55% of all public facility utilization while hospitals accounted for 42% and health center utilization accounted for just 2%.

Table 2: Socioeconomic related inequality and inequity in public health care utilization

Facility	Concentration Index [95% confidence interval]	Horizontal Equity Index [95% confidence interval]
Health posts	-0.3378* [-0.4707 -0.2084] se = 0.0678	-0.2752* [-0.4081 -0.1422] se = 0.0678
Clinics	-0.1174* [-0.1461 -0.08862] se = 0.0147	-0.0505* [-0.0835 -0.0259] se = 0.0147
Hospitals	0.0512* [0.0244 0.0779] se = 0.0137	0.1138* [0.0871 0.1406] se = 0.0137
All facilities combined	-0.0532* [-0.0734 -0.0331] se = 0.0103	0.0094 [-0.0108 0.0296] se = 0.0103

*Statistically significant (p<0.01) Concentration and Horizontal Equity indices

se= Standard Errors

Concentration index for need = -0.0626 statistically significant (p<0.01)

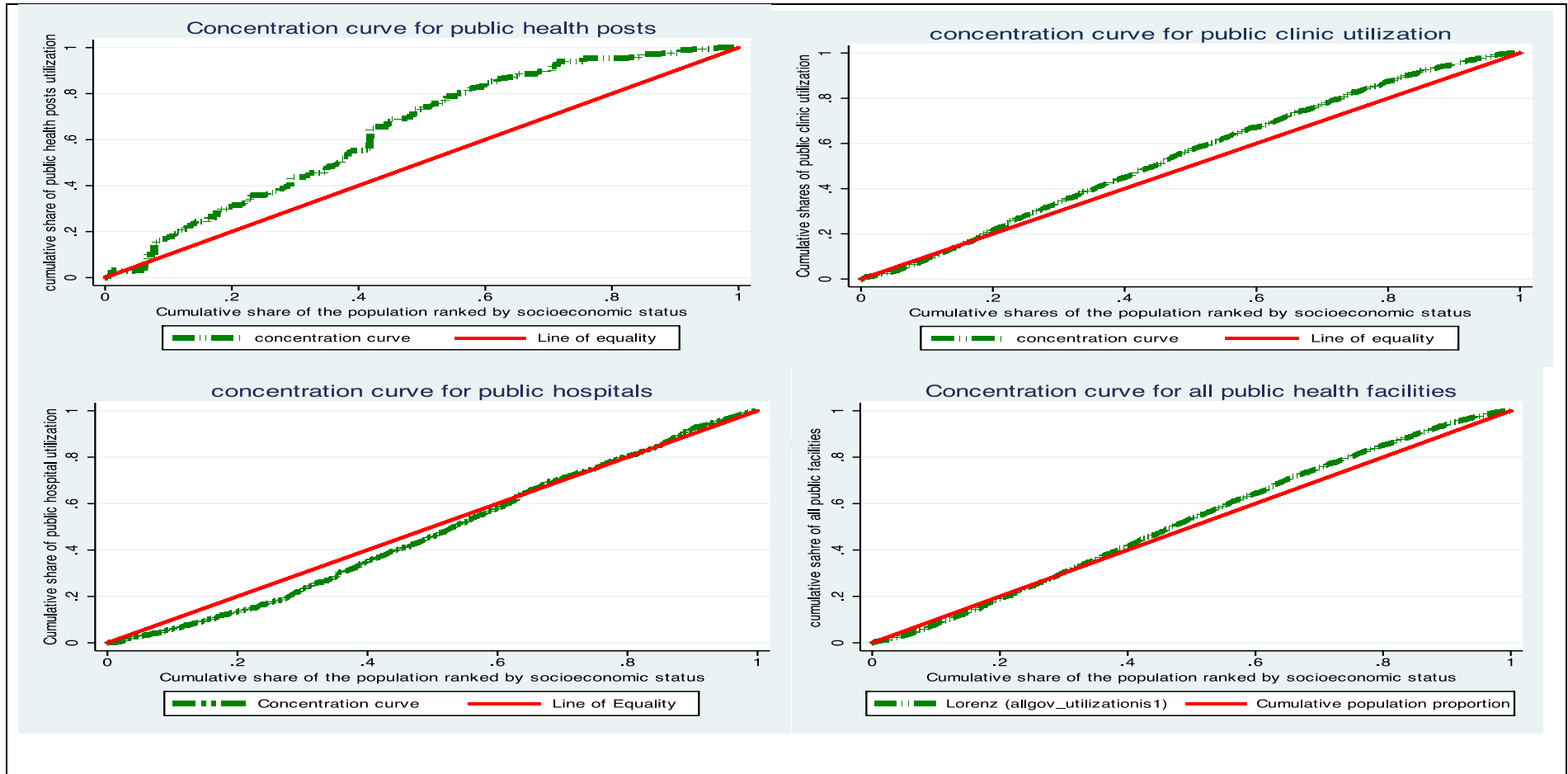
Inequality and inequity in health care utilization

The graphs reported in Fig. 2, where 45-degree lines of equality and the concentration curves for health care utilization are plotted, give a visual sense of this presence of inequalities. With the concentration curve for public health posts lying above the line of equality, it is suggested that utilization of this kind of facility is to the advantage of the poor. Dominance tests show that this curve dominates the line of equality. The concentration curves for clinics and all facilities combined despite crossing the line of equality mostly lie above their respective lines of equality, implying that utilization is to the advantage of the poor. On the contrary, the concentration curve for hospital utilization mostly lies below and also crosses the line of equality. This is indicative a pro-rich utilization at these facilities. This is confirmed by results presented in table 2 (second column), which shows statistically significant negative concentration indices for health posts, clinics and for all facilities combined. Accordingly, a statistically significant positive concentration index for hospital use was found.

When need is adjusted for, similar results are obtained (see Third column of table 2). The significantly negative horizontal equity indices for health post and clinics indicate unequal utilization for given need that is to the advantage of the worse-off. While horizontal inequity appears to favor the poor for primary public facilities (i.e. health posts and clinics), the magnitude of inequity varies, with a stronger pro-poor bias observed at health posts. Similarly, when pro-rich inequalities in hospital use are adjusted for health care need, pro-rich inequities are still found. On the other hand, despite the pro-poor inequalities in all public facilities combined, when adjusted for need, significant pro-rich inequity is detected, though insignificant at conventional levels. This shows that unequal utilization in all public facilities combined favors the rich. However, this was not statistically significant at conventional levels.

The results presented above are for the base case scenario (i.e. where α and β (i.e. the equivalence scale coefficients) are 0.5 and 0.75 respectively. When α and β are set to 0.3 and 1.0 respectively (i.e. the extreme recommended values), the actual concentration indices and horizontal indices values change but the decision rules of pro-poorness and pro-richness remain identical to the base case scenario.

Figure 2: Concentration curves for health care utilization



Discussion

Previous studies specifically focusing on health care utilization in Zambia have revealed that utilization is concentrated among individuals of higher socioeconomic status [14, 28]. These studies did not stratify by level of care and by sponsorship orientation (i.e. public or private funded). In addition, only one study took 'need' for health care into consideration [14]. Further, these studies were undertaken not too long after the pro-poor reforms (i.e. user fee removal) were put in place. While these studies are enlightening, this study provides more recent evidence, considering that more pro-poor health initiatives such as building of more health facilities within rural communities occurred long after these studies were done. Further, this study stratifies the analysis by level of care, so as to have a clearer picture of the presence and extent inequity for the different facility levels.

Overall, this study's results indicate that the rich utilize public health facilities more, especially public hospitals. Besides having lower need, the rich have higher use for all public care combined. These results suggest the presence of the inverse care law, which states that poor people, who are also confronted with higher 'need', use fewer health care services [10]. This is in line with the findings of previous studies that revealed distributions in general health care that favored the rich [14,28]. Similarly, pro-rich distributions are found in studies from other developing countries [8,9,42].

When stratified by level of care, the poor have greater use of primary facilities (i.e. health posts and clinics) in relation to need. This pro-poor distribution with regard to these facilities is similar to the results reported by Van de Walle and Zere and McIntyre, who all concluded that primary facilities offer the best option for reaching the poor [43,44]. In the same vein, primary facility use has been found to disproportionately benefit the poor in other countries outside Africa including Taiwan, South Korea and Israel [42,45]. Other studies, though not explicitly focusing on equity in health care utilization, but on monetary benefits of utilizing health care find similar results. In Kenya, Chuma and others found that the poor derive more benefits from using public primary facilities [46]. Mtei and others obtained similar results in Tanzania [47].

In the case of Zambia, considering the removal of user fees at primary health facilities it may not be unrealistic to see a pro-poor distribution. It is possible that the pro-poor inequities in primary health care use could be attributed to the reduced physical access barriers, as the

numbers of health posts and clinics have been increased with most of them located within communities [15].

The pro-poor public primary facility use has implications for ensuring equity in overall health care utilization in Zambia. Evidence of pro-poor utilization patterns of health care is an important shift that could be used for advocating greater allocation of resources to public primary facilities that have been found to greatly benefit the poor. Further, this pro-poor distribution of public health care utilization calls for initiatives to improve quality of health care services provided at these facilities. Given the well-known link between health and health care utilization, this is likely to reduce the known inequities in health, thereby, promoting the health of the poor [2].

On the other hand, public hospital utilization is highly concentrated among the rich when need was taken into account. This result concurs with the results of Zere and McIntyre who explored horizontal inequity in health care utilization in South Africa [44]. However, these authors did not distinguish between public and private hospitals. Comparable results in terms of monetary benefits were also found in some African countries, where the benefits of using public hospitals were highly concentrated among the well-off [46,47].

These pro-rich results for hospital use have some policy implications. Government policies aimed at improving physical and financial accessibility of public hospitals would probably be a move in the right direction considering that such measures have been shown to yield positive results, at primary facilities.

The main strength of this study is its ability to specifically disaggregate the analysis by different health care facility levels, which has not really been a main focus of health care utilization inequity studies done in developing countries. Because of this stratification it is actually revealed that the pro-rich distribution of overall public health care services is due to the pro-rich distribution of higher-level facilities, particularly hospitals. In addition, this study standardizes the utilization and need variables for age and sex, an approach that is not done in most studies. Doing so enables the estimation of a more refined description of the relationship between the two variables (health care utilization and need) and socioeconomic status [33].

This study also has a few limitations. Firstly, like all other studies that use household survey data, the data collected from the 2010 Zambia LCMS, particularly for the variables of

health care utilization, and need measurement used in this study, were subject to respondents recall biases [48]. Secondly, based on the fact that medical determination of need for health care services is hardly a feasible task within the LCMS context and that the LCMS unlike other surveys did not ask respondents to explicitly rank their health status, this study uses self-reported illness to measure 'need' for health care. It has generally been stated that socioeconomic differences affect respondent's ability to interpret some symptoms as marking an episode of illness [14]. Respondents of different socioeconomic groups may have dissimilar evaluations about what normal health status ought to be. It is generally noted that poorer groups are less likely to report illness by modifying their illness perception as a coping strategy to prevent them from incurring the costs associated with illness [6]. However, a composite variable that accounts for functional limitations and duration of illness was used to reduce the bias in using only self-reported illness. Additionally, this study does not take into consideration the quality of health care between facilities. Another limitation of this study which arises from the use of concentration curves/indices is that these methods assume that the average population relationship between the need for and the use of care implies that vertical equity holds [33]. This may not always be the case.

In summary, the study finds pro-poor inequalities and inequities at public primary facilities (health posts and clinics) and pro-rich inequities for hospital utilization in Zambia. These lead to a pro-rich distribution when all public facilities are combined. There is however a need for further research, beyond the quantification of inequality/inequity, to inquire what features actually drive this distribution of health care utilization.

Conclusion

It is acknowledged that good health is essential in achieving economic growth. Also, suitable access to and utilization of health care is an essential aim of policies seeking to fight poverty and reduce inequality. In Zambia, this aim has been endorsed. This study uses data from the 2010 Living Conditions and Monitoring Survey to assess inequities in public health care utilization. Pro-poor distributions for primary facility use and pro-rich distribution for higher-level hospital use was found. This reveals that government resources, at least at the primary care level, are targeted at the poor. However, this is not the case for higher-level hospitals and for all public facilities combined. This calls for initiatives that focus on strengthening primary facilities that serve the poor. In addition, deliberate policy efforts whose aim is to

reduce access barriers ought to be put in place so as to ensure that health care utilization at higher-level facilities is distributed in accordance with need for it.

List of Abbreviations

LCMS Living Conditions and Monitoring Survey

SAPs Structural Adjustment Programs

MoH Ministry of Health

MoFNP Ministry of Finance and National Planning

Competing Interest

The author declares that they are no competing interests.

Author's contribution.

JP, who conceived the idea for the study and its design, was also responsible for data analyses and preparation of the manuscript.

Author's information.

JP is a Master's student in Public Health, specializing in Health Economics at the University of Cape Town.

Acknowledgement

The authors are grateful to Strategies for Health Insurance and Equity in Less Developed countries (SHIELD) project for the funding and assistance in conducting this study. Further acknowledgements go to the Zambian SHIELD project members for procuring the data from CSO.

Endnotes

- (a) Poor health conditions and poverty reinforce each other making it difficult for the poor to break out of poverty. The two reinforce each other in that; poor health causes low economic productivity, which in turn causes poverty. Whilst living in poverty individuals are susceptible to ill health and the cycle continues [see [5]]. (b) Using the Multiple Correspondence Analysis (MCA) decision rule where non-dominance exists if there is no significant difference at any quantile [see 33].

References

- [1] Strauss, J. & Thomas, D. "Health, nutrition, and economic development", *Journal of Economic Literature*, 1998, pp. 766-817.
- [2] Van de Walle, D., Assessing the welfare impacts of public spending. *World Development*, 1998;26(3):15–26.
- [3] Aghion P, Bolton P. A theory of trickle-down growth and development. *Reviews Ecology Study* 1997;64(2):151–72.
- [4] Cutler, D.M., Lleras-Muney, A. & Vogl, T. *Socioeconomic status and health: dimensions and mechanisms*, 2008.
- [5] Sala-i-Martin, X. 2005. *On the health-poverty trap*, in *Health and Economic Growth: Findings And Policy Implications* edited by Guillem López i Casanovas, Berta Rivera, Luis Currais Cambridge, MA: MIT Press. 2005
- [6] Cisse, B., Luchini, S. & Moatti, J.P. "Progressivity and horizontal equity in health care finance and delivery: What about Africa?", *Health Policy*, 2007 vol. 80, no. 1, pp. 51-68.
- [7] Balarajan, Y., Selvaraj, S. & Subramanian, S. "Health care and equity in India", *Lancet*, 2011 vol. 377, no. 9764, pp. 505.
- [8] Prinja, S., Kanavos, P. & Kumar, R. "Health care inequities in north India: Role of public sector in universalizing health care", *The Indian Journal of Medical Research*, 2012, vol. 136, no. 3, pp. 421.
- [9] Szwarcwald, C.L., Souza-Júnior, P.R.B. & Damacena, G.N. "Socioeconomic inequalities in the use of outpatient services in Brazil according to health care need: evidence from the World Health Survey", *BMC Health Services Research*, 2010, vol. 10, no. 1, pp. 217.
- [10] Tudor Hart, J. "The inverse care law", *The Lancet*, 1971 vol. 297, no. 7696, pp. 405-412.
- [11] Preker AS, Langenbrunner JC, editors. *Spending wisely. Buying health services for the poor*. The World Bank; 2005.
- [12] McIntyre D, Gilson L. Putting equity in health back onto the social policy agenda: experience from South Africa. *Social Science Medicine* 2002; 54(11): 1637–56.

- [13] Ministry of Finance and National Planning, *Vision 2030*, Government of the Republic of Zambia, 2010, Lusaka.
- [14] Bonfrer, I., Poel, E., Grimm, M. & Doorslaer, E.K.A. *Does health care utilization match needs in Africa? Challenging conventional needs measurement*, 2012.
- [15] University of Zambia Department of Economics, Ministry of Health, TARSC *Equity watch: assessing progress towards equity in health in Zambia*, EQUINET, Lusaka and Harare.
- [16] Sitali, M. "Policy Brief: Economic Partnership agreements: A challenge for trade and justice", Jesuit Center for Theological Reflections (JCTR), 2007, Lusaka.
- [17] Hjortsberg, C. & Mwikisa, C. "Cost of access to health services in Zambia", *Health Policy and Planning*, 2002, vol. 17, no. 1, pp. 71-77.
- [18] Muzyamba, G. & Masabe, E. "Evaluation of the public welfare assistance scheme", Government Printers, 1998, Lusaka.
- [19] Sehamani, V. "Poverty Monitoring and Evaluation by civil society in Zambia: Rationale, Objectives and methodology", Civil Society for Poverty Reduction (CSPR), 2003, Lusaka.
- [20] Ministry of Health, *National Health Strategic Plan 2006- 2011*, Government of the Republic of Zambia, 2006, Lusaka.
- [21] Cheelo, C., Chama, C., Pollen, G., Carasso, B., Palmer, N., Jonsson, D., Lagarde, M. & Chansa, C. "Do user fee revenues matter? Assessing the influences of the removal of user fees on health financial resources in Zambia" 2010.
- [22] Masiye, F., Chitah, B.M., Chanda, P. & Simeo, F. "Removal of user fees at primary health care facilities in Zambia: a study of the effects on utilisation and quality of care", *Regional Network for Equity in Health in east and southern Africa Discussion Paper*, 2008, no. 57.
- [23] Blas, E. & Limbambala, M. "User-payment, decentralization and health service utilization in Zambia", *Health Policy and Planning*, 2008, vol. 16, no. suppl 2, pp. 19-28.
- [24] Brown, C. J., Pagán, J. A., Rodríguez-Oreggia, E. 2002 Inequality in Health Care Utilization in Mexico Center of Border Economic Studies The University of Texas-Pan American, Working Paper #2002-12 November 2002
- [25] Patychuk, D. & Seskar-Hencic, D. *Steps to equity: ideas and strategies for health Equity in Ontario, 2008-2010*. Toronto (ON): 2008. Retrieved Jun 20, 2009, .
- [26] Van de Poel, E., Hosseinpoor, A.R., Speybroeck, N., Van Ourti, T. & Vega, J. 2008, "Socioeconomic inequality in malnutrition in developing countries", *Bulletin of the World Health Organization*, vol. 86, no. 4, pp. 282-291.

- [27] Almqvist, A. "Socioeconomic inequity in Zambian children's health status—differences between rural and urban areas.", 2010 . WHAT JOURNAL???
- [28] Makinen, M., Waters, H., Rauch, M., Almagambetova, N., Bitran, R., Gilson, L., McIntyre, D., Pannarunothai, S., Prieto, A.L. & Ubilla, G. "Inequalities in health care use and expenditures: empirical data from eight developing countries and countries in transition", *Bulletin of the World Health Organization*, 2000, vol. 78, no. 1, pp. 55-65.
- [29] Kawachi, I., Subramanian, S. & Almeida-Filho, N. "A glossary for health inequalities", *Journal of Epidemiology and Community Health*, 2002, vol. 56, no. 9, pp. 647-652.
- [30] Whitehead, M. "The concepts and principles of equity and health", *International Journal of Health Services*, 1992, vol. 22, no. 3, pp. 429-445.
- [31] Braveman, P.A., Cubbin, C., Egerter, S., Chideya, S., Marchi, K.S., Metzler, M. & Posner, S. "Socioeconomic status in health research", *JAMA: the Journal of the American Medical Association*, 2005, vol. 294, no. 22, pp. 2879-2888.
- [32] Central Statistical Office (CSO) Ministry of Health (MOH) Tropical Diseases Research Centre (TDRC) University of Zambia, and Macro International Inc. 2009, "Zambia Demographic and Health Survey 2007", .
- [33] O'Donnell, O., Van Doorslaer, E., Wagstaff, A. & Lindelow, M. *Analyzing health equity using household survey data: a guide to techniques and their implementation*, World Bank Publications 2008.
- [34] Deaton, A. & Zaidi, S. Guidelines for constructing consumption aggregates for welfare analysis, 2002, World Bank Publications.
- [35] Akazili, C. 2010, *Equity in health care financing in Ghana*. PhD Thesis, University of Cape Town
- [36] Ataguba, J.E. & McIntyre, D. "Paying for and receiving benefits from health services in South Africa: is the health system equitable?", *Health Policy and Planning*, 2012, vol. 27, no. suppl 1, pp. i35-i45.
- [37] Garcia, L.P., Höfelmann, D.A. & Facchini, L.A. 2010, "Self-rated health and working conditions among workers from primary health care centers in Brazil", *Cadernos de Saúde Pública*, vol. 26, no. 5, pp. 971-980.
- [38] Kawachi, I., Subramanian, S. & Almeida-Filho, N. "A glossary for health inequalities", *Journal of Epidemiology and Community Health*, 2002, vol. 56, no. 9, pp. 647-652.
- [39] Wagstaff, A., Van Doorslaer, E. & Paci, P. "On the measurement of horizontal inequity in the delivery of health care", *Journal of Health Economics*, 1991, vol. 10, no. 2, pp. 169-205.
- [40] Wagstaff, A. "The Bounds of the Concentration Index When the Variable of Interest Is Binary, with an Application to Immunization Inequality." *Health Economics*, 2005, 14(4): 429–32.

- [41] Ataguba, J.E., Akazili, J., McIntyre, D. "Socioeconomic-related health inequality in South Africa: evidence from General Household Surveys" *International Journal for Equity in Health*, 2011, 10:48
- [42] Shabnam, J., Gifford, M. & Dalal, K. "Socioeconomic inequalities in the use of delivery care services in Bangladesh: a comparative study between 2004 and 2007", *Health*, 2011, vol. 3, no. 12, pp. 762-771.
- [43] Van de Walle, D. The distribution of subsidies through public health services in Indonesia, 1978-87. *In: van de Walle D, Nead K, editors. Public spending and the poor: theory and evidence. Baltimore, MD: Johns Hopkins University Press, 1995:226-58.*
- [44] Zere E, McIntyre D. Equity in self-reported adult illness and use of health service in South Africa: inter-temporal comparison. *Journal of Health, Population Nutrition* 2003;21(3):205–15.
- [45] Lu, J.R., Leung, G.M., Kwon, S., Tin, K.Y.K., Van Doorslaer, E. & O'Donnell, O. "Horizontal equity in health care utilization evidence from three high-income Asian economies", *Social Science & Medicine*, 2007, vol. 64, no. 1, pp. 199-212.
- [46] Chuma, J., Maina, T., Ataguba, J. "Does the distribution of health care benefits in Kenya meet the principles of universal coverage" *BMC Public Health*, 2012, 12:20
- [47] Mtei, G., Makawia, S., Ally, M., Kuwawenaruwa, A., MeheuS, F., & Borghi, J. "Who pays and who benefits from health care? An assessment of equity in health care financing and benefit distribution in Tanzania Health Policy and Planning 2012;27:i23–i34
- [48] Sudman S, Bradburn NM: Effects of time and memory factors on response in surveys. *Journal of the American Statistical Association* 1973, 68:805-15.

Section D: Policy Brief

University of Cape
Town

Socioeconomic inequalities in Zambia's public health care delivery system

Key Points

- ◆ The poor have a relatively greater need for health care than the rich
- ◆ Poorer Zambians mainly visit primary health facilities (i.e. health posts and clinics) compared to the rich that mainly visit public hospitals
- ◆ In total, combining visits to primary and hospital levels, richer Zambians visit more public health facilities than the poor relative to their need for health care.
- ◆ Since the poor use more primary facilities than the rich, this calls for initiatives aimed at strengthening public primary health care system in Zambia.



Introduction

Socioeconomic inequalities and inequities in health care utilization are receiving growing attention among policy makers worldwide. This is because individuals with better health use more health services than the poor who need them most. However, socioeconomic inequalities and inequities in health care utilization have not been extensively explored in sub-Saharan Africa. During the late 1980's Zambia's economy was not performing to expectations. In order to improve this situation, the government in the early 1990's introduced reforms, which included reducing public expenditure on health and education.

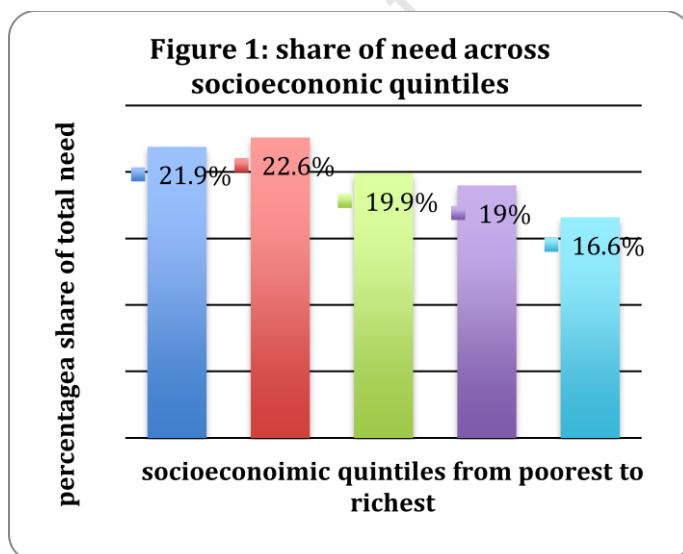
Consequently, user fees at all public health facilities care were introduced. The period during and after the introduction of these reforms was typically characterized by high levels of inequalities in health, health care use and development indicators between different socioeconomic groups. To address this, the new government in 1993 initiated efforts aimed at improving the plight of the poor. These measures included, among others, making health facilities easily reachable and later on in 2006 removal of user fees at all primary health facilities. However these measures did not totally achieve the desired objectives. Inequalities in use of health services still continued with the poor bearing a disproportionate burden of illness. There is a recent need to explore if successive governments have been able to reduce the inequalities in Zambian health system. This policy brief examines this issue using data from the 2010 Zambia Living Conditions and Monitoring Survey.

Box 1

Socioeconomic inequality in health care utilization refers the differences in health care use that is related to individuals' socioeconomic position. Socioeconomic inequity, on the other hand refers to differences in health service use that is not determined by individuals' need for health care

Who has the greatest need for health care?

Generally, we are interested in a situation whereby the use of health services is determined by need for care. Those with poorer health ought to receive more health services than other groups with relatively less need for health care. In this study, 'need' for health care services, determined by the



burden of illness, is more on the poor: the poorer groups have disproportionately more need than do the rich. [See figure 1].

Are there differences in use of public health care between different socioeconomic groups?

The use of public clinics and health posts (also known as public primary health facilities) is in favor of the poor. On the contrary, the use of public hospital is in favor of the rich. When all the public health facilities are combined, the result is in favor of the rich. This means that the rich visit public health facilities more than the poor that shoulder a greater burden of illness. Table 1 summarizes, who, between the rich and poor use health services more in comparison with their respective burden of illness.

Table1: summary of who uses more health care relative to need

Facility	Who benefits from using facility in comparison to burden of illness?
Public health posts	In favor of the poor
Public clinics	In favor of the poor
Public hospitals	In favor of the rich
All public facilities	In favor of the rich

Policy recommendations

Based on the outcome of this research, it is likely that the deliberate health policy measures, by successive governments, to address the concerns of the poor such as the building of clinics and health posts within communities and the removal of user fees at primary facilities have made these facilities easily reachable and affordable. However, this is not so for hospital use. The rich are using more hospitals services than the poor. These findings have important policy implications.

- ◆ This calls for focus on strengthening public primary health care systems. Ways of doing this would include, allocating additional funding to these facilities and also broadening the benefit package.
- ◆ It would also be helpful to extend the reforms at primary health care levels, e.g. user fee removal, to higher facilities such as hospitals. This is because these reforms have proven to be useful in giving access to the poor. However, it is important to bear in mind that user fee removal calls for careful preparation coupled with suitable accompanying measures to enable adequate funding. One option for alternative funding could be the introduction of a pre payment arrangement, particularly, a national health insurance scheme.

Support and funding

This study is supported and funded by the Strategies for Health Insurance and Equity in Less developed countries (SHIELD) project. The project is in turn funded by the International Development Research Council (IDRC). SHIELD project focuses on generating evidence aimed at promoting equity.

Bibliography

- Balarajan, Y., Selvaraj, S. & Subramanian, S. 2011, "Health care and equity in India", *Lancet*, vol. 377, no. 9764, pp. 505.
- Bonfrer, I., Poel, E., Grimm, M. & Doorslaer, E.K.A. 2012, *Does health care utilization match needs in Africa? Challenging conventional needs measurement*, .
- Cisse, B., Luchini, S. & Moatti, J.P. 2007, "Progressivity and horizontal equity in health care finance and delivery: What about Africa?", *Health Policy*, vol. 80, no. 1, pp. 51-68.
- Masiye, F., Chitah, B.M., Chanda, P. & Simeo, F. 2008, "Removal of user fees at primary health care facilities in Zambia: a study of the effects on utilization and quality of care", *Regional Network for Equity in Health in east and southern Africa Discussion Paper*, no. 57.
- Muzyamba, G. & Masabe, E. 1998, *Evaluation of the public welfare assistance scheme*, Government Printers, Lusaka.
- Strauss, J. & Thomas, D. 1998, "Health, nutrition, and economic development", *Journal of economic literature*, pp. 766-817.

University of Zambia Department of Economics, Ministry of Health, TARSCEquity watch: assessing progress towards equity in health in Zambia, EQUINET, Lusaka and Harare.

Van de Walle, D., Assessing the welfare impacts of public spending. *World Development*, 1998; 26(3): 15–26.

Section E: Appendices

University of Cape
Town

Appendix 1: Plagiarism Declaration

1. I know that plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.
2. I have used the Harvard style for the protocol, literature review and Vancouver for the journal manuscript. Each quotation in this thesis from the work(s) of other people has been attributed, and has been cited and referenced.
3. This mini-dissertation is my own work. I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work.

Name: JANE PHIRI

Student Number: PHRJAN002

Signature:

Signed by candidate

Date: 22 May 2013

University of Cape
Town

Appendix 2: Human Research ethics approval

HREC Ref 629/2012 – 17 Dec 2012

UNIVERSITY OF CAPE TOWN



Faculty of Health Sciences
Human Research Ethics Committee
Room 551-24 Groote Schuur Hospital Old Main Building
Observatory 7925
Telephone (021) 406 6336 • Facsimile (021) 406 6411
e-mail: hurec@hsc.uct.ac.za

7 December 2012

HREC REF: 629/2012

Ms J Phiri
c/o Mr J Alaguba
Public Health & Family Medicine
Falmouth Building

Dear Ms Phiri

PROJECT TITLE: SOCIOECONOMIC INEQUALITIES IN ZAMBIA'S PUBLIC HEALTH CARE DELIVERY SYSTEM

Thank you for responding to the issues raised by the Faculty of Health Sciences Human Research Ethics Committee in your letter dated 5th December 2012.

It is a pleasure to inform you that the HREC has formally approved the above-mentioned study.

Approval is granted for one year till the 15th December 2013

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: www.health.uct.ac.za/ospacch/humanethics/forms)

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please quote the HREC REF in all your correspondence.

Yours sincerely

PROFESSOR M BLOCKMAN
CHAIRPERSON, PHS HUMAN ETHICS
Federal Wide Assurance Number: PWA00001637

Institutional Review Board (IRB) number: IRR00001938

This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC SA), Food and Drug Administration (FDA-USA), International Convention on Harmonisation Good Clinical Practice (ICH-GCP) and Declaration of Helsinki guidelines.

HREC Ref 629/2012 – 17 Dec 2012

The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines; Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code of Federal Regulation Part 312.55 and 312.61

Appendix 3: Journal manuscript instructions

International Journal for Equity in Health

Research Articles

Preparing main manuscript text

Overview of manuscript sections for Research Articles

Manuscripts for Research Articles submitted to *International Journal for Equity in Health* should be divided into the following sections (in this order):

- [Title page](#)
- [Abstract](#)
- [Additional non-English language abstract](#)
- [Keywords](#)
- [Introduction](#)
- [Methods](#)
- [Results and discussion](#)
- [Conclusions](#)
- [List of abbreviations used](#) (if any)
- [Competing interests](#)
- [Authors' contributions](#)
- [Authors' information](#)
- [Acknowledgements](#)
- [Endnotes](#)
- [References](#)
- [Illustrations and figures](#) (if any)
- [Tables and captions](#)
- [Preparing additional files](#)

Title page

The title page should:

list the full names, institutional addresses and email addresses for all authors and indicate the corresponding author

Please note:

- the title should include the study design, for example "A versus B in the treatment of C: a randomized controlled trial X is a risk factor for Y: a case control study"
- abbreviations within the title should be avoided

Abstract

The Abstract of the manuscript should not exceed 350 words and must be structured into separate sections: **Introduction**, the context and purpose of the study; **Methods**, how the study was performed and statistical tests used; **Results**, the main findings; **Conclusions**, brief

summary and potential implications. Please minimize the use of abbreviations and do not cite references in the abstract. **Trial registration**, if your research reports the results of a controlled health care intervention, please list your trial registry, along with the unique identifying number (e.g. **Trial registration**: Current Controlled Trials ISRCTN73824458). Please note that there should be no space between the letters and numbers of your trial registration number. We recommend manuscripts that report randomized controlled trials follow the [CONSORT extension for abstracts](#).

Additional non-English language abstract

An additional non-English language abstract can be included within the article. The additional abstract should be placed after the official English language abstract in the submitted manuscript file and should not exceed 350 words. Please ensure you indicate the language of your abstract. In addition to English, we can support German, Spanish, French, Norwegian and Portuguese abstracts.

Keywords

Three to ten keywords representing the main content of the article.

Introduction

The Introduction section should be written in a way that is accessible to researchers without specialist knowledge in that area and must clearly state - and, if helpful, illustrate - the background to the research and its aims. Reports of clinical research should, where appropriate, include a summary of a search of the literature to indicate why this study was necessary and what it aimed to contribute to the field. The section should end with a brief statement of what is being reported in the article.

Methods

The methods section should include the design of the study, the setting, the type of participants or materials involved, a clear description of all interventions and comparisons, and the type of analysis used, including a power calculation if appropriate. Generic drug names should generally be used. When proprietary brands are used in research, include the brand names in parentheses in the Methods section.

For studies involving human participants a statement detailing ethical approval and consent should be included in the methods section. For further details of the journal's editorial policies and ethical guidelines see ['About this journal'](#).

For further details of the journal's data-release policy, see the policy section in ['About this journal'](#).

Results and discussion

The Results and discussion may be combined into a single section or presented separately. Results of statistical analysis should include, where appropriate, relative and absolute risks or risk reductions, and confidence intervals. The Results and discussion sections may also be broken into subsections with short, informative headings.

Conclusions

This should state clearly the main conclusions of the research and give a clear explanation of their importance and relevance. Summary illustrations may be included.

List of abbreviations

If abbreviations are used in the text they should be defined in the text at first use, and a list of abbreviations can be provided, which should precede the competing interests and authors' contributions.

Competing interests

A competing interest exists when your interpretation of data or presentation of information may be influenced by your personal or financial relationship with other people or organizations. Authors must disclose any financial competing interests; they should also reveal any non-financial competing interests that may cause them embarrassment were they to become public after the publication of the manuscript.

Authors are required to complete a declaration of competing interests. All competing interests that are declared will be listed at the end of published articles. Where an author gives no competing interests, the listing will read 'The author(s) declare that they have no competing interests'.

When completing your declaration, please consider the following questions:

Financial competing interests

- In the past five years have you received reimbursements, fees, funding, or salary from an organization that may in any way gain or lose financially from the publication of this manuscript, either now or in the future? Is such an organization financing this manuscript (including the article-processing charge)? If so, please specify.
- Do you hold any stocks or shares in an organization that may in any way gain or lose financially from the publication of this manuscript, either now or in the future? If so, please specify.
- Do you hold or are you currently applying for any patents relating to the content of the manuscript? Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript? If so, please specify.
- Do you have any other financial competing interests? If so, please specify.

Non-financial competing interests

Are there any non-financial competing interests (political, personal, religious, ideological, academic, intellectual, commercial or any other) to declare in relation to this manuscript? If so, please specify.

If you are unsure as to whether you, or one your co-authors, has a competing interest please discuss it with the editorial office.

Authors' contributions

In order to give appropriate credit to each author of a paper, the individual contributions of authors to the manuscript should be specified in this section.

An 'author' is generally considered to be someone who has made substantive intellectual contributions to a published study. To qualify as an author one should 1) have made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; 2) have been involved in drafting the manuscript or revising it critically for important intellectual content; and 3) have given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content. Acquisition of funding, collection of data, or general supervision of the research group, alone, does not justify authorship.

We suggest the following kind of format (please use initials to refer to each author's contribution): AB carried out the molecular genetic studies, participated in the sequence alignment and drafted the manuscript. JY carried out the immunoassays. MT participated in the sequence alignment. ES participated in the design of the study and performed the statistical analysis. FG conceived of the study, and participated in its design and coordination and helped to draft the manuscript. All authors read and approved the final manuscript.

All contributors who do not meet the criteria for authorship should be listed in an acknowledgements section. Examples of those who might be acknowledged include a person who provided purely technical help , writing assistance, or a department chair who provided only general support.

Authors' information

You may choose to use this section to include any relevant information about the author(s) that may aid the reader's interpretation of the article, and understand the standpoint of the author(s). This may include details about the authors' qualifications, current positions they hold at institutions or societies, or any other relevant background information. Please refer to authors using their initials. Note this section should not be used to describe any competing interests.

Acknowledgements

Please acknowledge anyone who contributed towards the article by making substantial contributions to conception, design, acquisition of data, or analysis and interpretation of data, or who was involved in drafting the manuscript or revising it critically for important intellectual content, but who does not meet the criteria for authorship. Please also include the source(s) of funding for each author, and for the manuscript preparation. Authors must describe the role of the funding body, if any, in design, in the collection, analysis, and interpretation of data; in the writing of the manuscript; and in the decision to submit the manuscript for publication. Please also acknowledge anyone who contributed materials essential for the study. If a language editor has made significant revision of the manuscript, we recommend that you acknowledge the editor by name, where possible.

The role of a scientific (medical) writer must be included in the acknowledgements section, including their source(s) of funding. We suggest wording such as 'We thank Jane Doe who provided medical writing services on behalf of XYZ Pharmaceuticals Ltd.'

Authors should obtain permission to acknowledge from all those mentioned in the Acknowledgements section.

Endnotes

Endnotes should be designated within the text using a superscript lowercase letter and all notes (along with their corresponding letter) should be included in the Endnotes section. Please format this section in a paragraph rather than a list.

References

All references, including URLs, must be numbered consecutively, in square brackets, in the order in which they are cited in the text, followed by any in tables or legends. Each reference must have an individual reference number. Please avoid excessive referencing. If automatic numbering systems are used, the reference numbers must be finalized and the bibliography must be fully formatted before submission.

Only articles, datasets, clinical trial registration records and abstracts that have been published or are in press, or are available through public e-print/preprint servers, may be cited; unpublished abstracts, unpublished data and personal communications should not be included in the reference list, but may be included in the text and referred to as "unpublished observations" or "personal communications" giving the names of the involved researchers. Obtaining permission to quote personal communications and unpublished data from the cited colleagues is the responsibility of the author. Footnotes are not allowed, but endnotes are permitted. Journal abbreviations follow Index Medicus/MEDLINE. Citations in the reference list should include all named authors, up to the first 30 before adding '*et al.*'.

Any *in press* articles cited within the references and necessary for the reviewers' assessment of the manuscript should be made available if requested by the editorial office.

Style files are available for use with popular bibliographic management software:

- [BibTeX](#)
- [EndNote style file](#)
- [Reference Manager](#)
- [Zotero](#)

Examples of the *International Journal for Equity in Health* reference style are shown [below](#). Please ensure that the reference style is followed precisely; if the references are not in the correct style they may have to be retyped and carefully proofread.

All web links and URLs, including links to the authors' own websites, should be given a reference number and included in the reference list rather than within the text of the manuscript. They should be provided in full, including both the title of the site and the URL, in the following format: **The Mouse Tumor Biology Database** [http://tumor.informatics.jax.org/mtbwi/index.do]. If an author or group of authors can clearly

be associated with a web link, such as for weblogs, then they should be included in the reference.

Examples of the *International Journal for Equity in Health* reference style

Article within a journal
Koonin EV, Altschul SF, Bork P: **BRCA1 protein products: functional motifs.** *Nat Genet* 1996, **13**:266-267.

Article within a journal supplement
Orengo CA, Bray JE, Hubbard T, LoConte L, Sillitoe I: **Analysis and assessment of ab initio three-dimensional prediction, secondary structure, and contacts prediction.** *Proteins* 1999, **43**(Suppl 3):149-170.

In press article
Kharitonov SA, Barnes PJ: **Clinical aspects of exhaled nitric oxide.** *Eur Respir J*, in press.

Published abstract
Zvaifler NJ, Burger JA, Marinova-Mutafchieva L, Taylor P, Maini RN: **Mesenchymal cells, stromal derived factor-1 and rheumatoid arthritis [abstract].** *Arthritis Rheum* 1999, **42**:s250.

Article within conference proceedings
Jones X: **Zeolites and synthetic mechanisms.** In *Proceedings of the First National Conference on Porous Sieves: 27-30 June 1996; Baltimore.* Edited by Smith Y. Stoneham: Butterworth-Heinemann; 1996:16-27.

Book chapter, or article within a book
Schnepf E: **From prey via endosymbiont to plastids: comparative studies in dinoflagellates.** In *Origins of Plastids. Volume 2.* 2nd edition. Edited by Lewin RA. New York: Chapman and Hall; 1993:53-76.

Whole issue of journal
Ponder B, Johnston S, Chodosh L (Eds): **Innovative oncology.** In *Breast Cancer Res* 1998, **10**:1-72.

Whole conference proceedings
Smith Y (Ed): *Proceedings of the First National Conference on Porous Sieves: 27-30 June 1996; Baltimore.* Stoneham: Butterworth-Heinemann; 1996.

Complete book
Margulis L: *Origin of Eukaryotic Cells.* New Haven: Yale University Press; 1970.

Monograph or book in a series
Hunninghake GW, Gadek JE: **The alveolar macrophage.** In *Cultured Human Cells and Tissues.* Edited by Harris TJR. New York: Academic Press; 1995:54-56. [Stoner G (Series Editor): *Methods and Perspectives in Cell Biology*, vol 1.]

Larger datasets or tables too wide for a landscape page can be uploaded separately as additional files. Additional files will not be displayed in the final, laid-out PDF of the article, but a link will be provided to the files as supplied by the author.

Tabular data provided as additional files can be uploaded as an Excel spreadsheet (.xls) or comma separated values (.csv). As with all files, please use the standard file extensions.

Preparing additional files

Although *International Journal for Equity in Health* does not restrict the length and quantity of data included in an article, we encourage authors to provide datasets, tables, movies, or other information as additional files.

Please note: All Additional files **will be published** along with the article. Do not include files such as patient consent forms, certificates of language editing, or revised versions of the main manuscript document with tracked changes. Such files should be sent by email to editorial@equityhealthj.com, quoting the Manuscript ID number.

Results that would otherwise be indicated as "data not shown" can and should be included as additional files. Since many weblinks and URLs rapidly become broken, *International Journal for Equity in Health* requires that supporting data are included as additional files, or deposited in a recognized repository . Please do not link to data on a personal/departmental website. The maximum file size for additional files is 20 MB each, and files will be virus-scanned on submission.

Additional files can be in any format, and will be downloadable from the final published article as supplied by the author. reuse. *e.g.* We recommend CSV rather than PDF for tabular data.

Certain supported files formats are recognized and can be displayed to the user in the browser. These include most movie formats (for users with the Quicktime plugin), mini-websites prepared according to our guidelines, chemical structure files (MOL, PDB), geographic data files (KML).

If additional material is provided, please list the following information in a separate section of the manuscript text:

- File name (e.g. Additional file 1)
- File format including the correct file extension for example .pdf, .xls, .txt, .pptx (including name and a URL of an appropriate viewer if format is unusual)
- Title of data
- Description of data

Additional files should be named "Additional file 1" and so on and should be referenced explicitly by file name within the body of the article, e.g. 'An additional movie file shows this in more detail [see Additional file 1]'.

Additional file formats

Ideally, file formats for additional files should not be platform-specific, and should be viewable using free or widely available tools. The following are examples of suitable formats.

- Additional documentation
 - PDF (Adobe Acrobat)
- Animations
 - SWF (Shockwave Flash)
- Movies
 - MP4 (MPEG 4)
 - MOV (Quicktime)
- Tabular data
 - XLS, XLSX (Excel Spreadsheet)
 - CSV (Comma separated values)

As with figure files, files should be given the standard file extensions.

Style and language

General

Currently, *International Journal for Equity in Health* can only accept manuscripts written in English. Spelling should be US English or British English, but not a mixture.

There is no explicit limit on the length of articles submitted, but authors are encouraged to be concise.

International Journal for Equity in Health will not edit submitted manuscripts for style or language; reviewers may advise rejection of a manuscript if it is compromised by grammatical errors. Authors are advised to write clearly and simply, and to have their article checked by colleagues before submission. In-house copyediting will be minimal. Non-native speakers of English may choose to make use of a copyediting service.

Language editing

For authors who wish to have the language in their manuscript edited by a native-English speaker with scientific expertise, BioMed Central recommends [Edanz](#). BioMed Central has arranged a 10% discount to the fee charged to BioMed Central authors by Edanz. Use of an editing service is neither a requirement nor a guarantee of acceptance for publication. Please contact [Edanz](#) directly to make arrangements for editing, and for pricing and payment details.

Help and advice on scientific writing

The abstract is one of the most important parts of a manuscript. For guidance, please visit our page on [Writing titles and abstracts for scientific articles](#).

Tim Albert has produced for BioMed Central a [list of tips](#) for writing a scientific manuscript. [American Scientist](#) also provides a list of resources for science writing. For more detailed guidance on preparing a manuscript and writing in English, please visit the [BioMed Central author academy](#).

Abbreviations

Abbreviations should be used as sparingly as possible. They should be defined when first used and a list of abbreviations can be provided following the main manuscript text.

Typography

- Please use double line spacing.
- Type the text unjustified, without hyphenating words at line breaks.
- Use hard returns only to end headings and paragraphs, not to rearrange lines.
- Capitalize only the first word, and proper nouns, in the title.
- All pages should be numbered.
- Use the *International Journal for Equity in Health* [reference format](#).
- Footnotes are not allowed, but endnotes are permitted.
- Please do not format the text in multiple columns.
- Greek and other special characters may be included. If you are unable to reproduce a particular special character, please type out the name of the symbol in full. **Please ensure that all special characters used are embedded in the text, otherwise they will be lost during conversion to PDF.**

University of Cape
Town

Appendix 4: Detailed Description of the Living Conditions Monitoring Survey (source: Living conditions and monitoring Survey Report 2006 and 2010)

Objectives of the Living Conditions Monitoring Surveys

The LCMS surveys were intended to highlight and monitor the living conditions of the Zambian society in the two reference periods of 2006 and 2010. The surveys included a set of priority indicators on poverty, welfare and living conditions, which have been repeated from previous surveys.

The main objective of the LCMS surveys was to provide the basis for comparison of poverty estimates derived from cross-sectional survey data between 2006 and 2010.

In addition, the survey provides a basis on which to:

Monitor the impact of government policies on the well being of the Zambian population.

Monitor the level of poverty and its distribution in Zambia.

Provide various users with a set of reliable indicators against which to monitor development.

Identify vulnerable groups in society and enhance targeting in policy implementation.

For the purpose of computing indicators to meet the stated objectives, the LCMS questionnaires included the following topics: Demography and migration Orphan hood Health Education Economic Activities Income Household Expenditure Household Assets Household Amenities and Housing Conditions Household Access to facilities Self-assessed poverty and household coping strategies, and Household Agricultural production

Sample design and coverage

The LCMS covered the entire nation on a sample basis. It covered both rural and urban areas in all the nine provinces. The survey was designed to provide data for each and every district in Zambia. A sample of 1,000 Standard Enumeration Areas (SEAs) was drawn to cover approximately 20,000 households.

Sample stratification and allocation

The sampling frame used for the LCMS VI was developed from the 2000 Census of Population and Housing. The country is administratively demarcated into 9 provinces, which are further divided into 72 districts. The districts are further subdivided into 150 constituencies, which are in turn divided into wards. For the purposes of conducting CSO surveys, Wards are further divided into Census Supervisory Areas (CSA), which are further subdivided into Standard Enumeration areas (SEAs). For the purposes of this survey, SEAs constituted the Primary Sampling Units (PSUs).

In order to have reasonable estimates at district level and at the same time take into account variation in the sizes of the districts, the survey adopted the Square Root sample allocation method. This approach offers a compromise between equal and proportional allocation i.e. small sized strata (Districts) are allocated larger samples compared to proportional allocation. However, it should be pointed out that the sample size for the smallest districts is still fairly small, so it is important to examine the confidence intervals for the district-level estimates in order to determine whether the level of precision is adequate. The allocation of the sample points to rural and urban strata was done in such a way that it was proportional to their sizes in each district. Although this method was used, it was observed from the LCMS 2006 that the coefficient of variation (CV) of the poverty estimates was highest in districts, which are predominantly urban and lowest in rural districts. This means that the sample size in some urban districts may have been inadequate to measure poverty with a good level of precision. That is, given the higher variability in the urban districts, a larger sample size would be required. Also some districts had very low CV estimates, indicating a higher level of precision for the poverty estimates. In order to try and improve the precision of the poverty estimates for the urban districts, the initial distribution of the sample was adjusted. It was necessary to increase the number of PSUs for some districts without increasing the budget and at the same time not compromising significantly the precision of the poverty estimates for rural areas. Rural districts, which had the lowest CVs in the 2006 LCMS results, had their sample size reduced, and these were in turn distributed to districts with the highest CVs. The distribution of the sample for the LCMS 2006 and LCMS 2010 were initially the same but changed after the later was adjusted.

Coverage

In the LCMS 2010, all the 1000 sampled SEAs were enumerated representing 100 percent coverage at national level.

The household response rate was calculated as the ratio of originally selected households with completed interviews over the total number of households selected. The household response rate was also generally very high with a national average of 98 percent of the originally selected households for the survey period.

Sample selection

The LCMS VI employed a two-stage stratified cluster sample design whereby during the first stage, 1000 SEAs were selected with Probability Proportional to Estimated Size (PPES) within the respective strata. The size measure was taken from the frame developed from the 2000 Census of Population and Housing. During the second stage, households were systematically selected from an enumeration area listing. The survey was designed to provide reliable estimates at the district, provincial, rural/urban and national levels. However, the reliability for some indicators may be limited for the smaller districts, given the limited sample size. This will be determined by the tabulation of sampling errors and confidence intervals.

Selection of Standard Enumeration Areas (SEAs)

The SEAs in each stratum were selected as follows:

- (i) Calculating the sampling interval (I) of the stratum.
- (ii) Calculate the cumulated size of the cluster (SEA)
- (iii) Calculate the sampling numbers
- (iv) Comparing each sampling number with the cumulated sizes

The first SEA with a cumulated size that was greater or equal to the random number was selected. The subsequent selection of SEAs was achieved by comparing the sampling numbers to the cumulated sizes of SEAs in the same manner.

Selection of households

Listing of all the households in the selected SEAs was done before a sample of households to be interviewed was drawn. In the case of rural SEAs, households were stratified and listed according to their agricultural activity status. Therefore, there were four explicit strata created at the second sampling stage in each rural SEA namely, the Small Scale Stratum (SSS), the Medium Scale Stratum (MSS), the Large Scale Stratum (LSS) and the Non-agricultural Stratum (NAS). For the

purposes of the LCMS VI, Seven, five and three households were selected from the SSS, MSS and NAS, respectively. The large-scale households were selected on a 100 percent basis. The urban SEAs were explicitly stratified into low cost, medium cost and high cost areas according to CSO's and local authority classification of residential areas.

From each rural and urban SEA, 15 and 25 households were selected, respectively. However, the number of rural households selected in some cases exceeded the prescribed sample size of 15 households depending on the availability of large scale farming households.

Assigning fully responding households sampling serial numbers preceded the selection of households from various strata. The circular systematic sampling method was used to select households. The method assumes that households are arranged in a circle and the following relationship applies:

Let $N = nk$,

Where: N = Total number of households assigned sampling serial numbers in a stratum n = Total desired sample size to be drawn from a stratum in a SEA, k = The sampling interval in a given SEA calculated as $k=N/n$.

Data collection

Data collection was done by way of personal interviews using a structured questionnaire. The questionnaire was designed to collect information on the various aspects of the living conditions of the households.

Estimation procedure

Sample weights

Due to the disproportionate allocation of the sample points to various strata, sampling weights are required to correct for differential representation of the sample at the national and sub-national levels. The weights of the sample are in this case equal to the inverse of the product of the two selection probabilities employed (one for each stage of selection).

Post Stratification Adjustment

The LCMS 2010 collected data on all usual household members in section 1 of the questionnaire. The weighted sum of the total number of household members (household size) is supposed to

give a fairly good and accurate estimate of the current population in a particular domain such as district, province, rural/urban and national level for which this survey was designed.

The weighted results generated by the LCMS 2010 underestimated the total population when compared to the CSO projected population. One of the main reasons is because of problems with the coverage of the listing. This is partly due to having the listing exercise in the field done concurrently with the questionnaire interviews by the same enumerators, which might have led to work overload that can contribute greatly to the listing problems. The other major listing problem is boundaries which no longer exist, i.e. the features used in 2000 have changed or have completely disappeared altogether. These frame problems will only be solved after the finalization of the new frame based on the Census 2010 and continuous frame updating thereafter.

The solution for now is the adjustment of the weights to reflect the 2010 population projections i.e. post-stratification of the weights or population weighting. The current Preliminary Census 2010 results were not available at the time the weights were generated. It should be pointed out that the preliminary census results were based on the concept of de facto population (usual members present and visitors), and institutional population was also included in these results. The population estimate from the surveys uses the concept of de jure (usual household members). This is the same concept used to generate the sampling frame and the population projections. This procedure is used for all national household surveys done by CSO.

Data processing and analysis

The Living Conditions Monitoring Survey data were entered using CSPro version 4.0 software. Two teams did the 2010 data entry, one team in the Provinces and another one at CSO headquarters. The data were then compared and matched by a team of matchers. Errors identified by matchers were corrected as a way of completing data entry. The major advantage of double entry (verification) is that data entry errors generated by the data entry operator are greatly minimized. The data were then exported to SAS, SPSS and Stata formats for data cleaning, tabulation and analysis.

Appendix 5: Living Conditions and Monitoring Survey (LCMS) Questionnaire

STATISTICAL DEPARTMENT

HOUSEHOLD NO.



REPUBLIC OF ZAMBIA

CENTRAL STATISTICAL OFFICE
 P.O. BOX 30809, LUSAKA, ZAMBIA
 TEL No. 096 253892/096 253893/096 253894
 FAX No. 096 253895/096 253896
 Email: csos@stat.gov.zm
 Website: www.stat.gov.zm

QUESTIONNAIRE NO. OF
 FORM

L	C	M	S	-	B
---	---	---	---	---	---

LIVING CONDITIONS MONITORING SURVEY VI (LCMS VI) – 2010

HOUSEHOLD QUESTIONNAIRE

HOUSEHOLD IDENTIFICATION PARTICULARS	CODE NUMBER
1. PROVINCE NAME	┌
2. DISTRICT NAME	┌┐
3. CONSTITUENCY NAME	┌┐┐
4. WARD NAME	┌┐┐┐
5. CSA NUMBER	┌┌
6. SEA NUMBER	┌
7. RURAL.....1 URBAN.....2	┌
8. SITUATION: RURAL: 1. Small Scale 2. Medium Scale 3. Large Scale 4. Non-Significant URBAN: 5. Low Cost 6. Medium Cost 7. High Cost	┌┌
9. HOUSEHOLD NUMBER (HIN)	┌
10. VILLAGE OR LOCALITY NAME	
11. CHIEF'S/CHIEFTAINSHIP AREA (RURAL AREAS ONLY) FOR URBAN AREAS RECORD III	┌┌┌
12. HOUSEHOLD SELECTION STATUS: 1. Originally selected household 2. Replacement household	┌
13. IF REPLACEMENT HOUSEHOLD, REASON FOR REPLACING: 1. Reluctant 2. Non contact 3. Unable to contact because 4. Other (Specify)	┌┐
14. ENUMERATED HOUSEHOLD Name of Head: _____ Address: _____ Starting Serial Number: _____	┌┌┌┌
15. NAME OF MAIN RESPONDENT SERIAL NUMBER FROM HOUSEHOLD ROSTER	┌

16. TOTAL NUMBER OF PERSONS WHO LIVE IN THIS HOUSEHOLD (INCLUDE USUAL MEMBERS
ABSENT) [][]

17. ENUMERATOR'S NAME..... DATE OF INTERVIEW

DD	MM	YY

18. SUPERVISOR'S NAME..... DATE OF CHECKING

DD	MM	YY

SECTION 3: HEALTH FOR ALL PERSONS

INTRODUCTION: I am now going to ask you about the health status of the members of the household.....

	1	2
Did ... have cough or cold during the last 12 weeks?	1	2
YES ONLY..... 1		
NO		
YES BUT NOT DURING LAST 12 WEEKS..... 2		
NO		
DON'T KNOW..... 3		
Did ... have any other illness during the last 12 weeks?		
YES ONLY..... 1		
NO		
DON'T KNOW..... 2		
Was any illness during the last 12 weeks due to any of the following diseases?		
YES ONLY..... 1		
NO		
DON'T KNOW..... 2		
1. COMMON COLD		
2. INFLUENZA		
3. MEASLES		
4. CHICKENPOX		
5. SCARLET FEVER		
6. DYSENTERY		
7. SHIGELLA		
8. TYPHOID		
9. MALARIA		
10. OTHER		
11. NONE OF THESE		
12. OTHER		
13. NONE		
14. OTHER		
15. NONE		
16. OTHER		
17. NONE		
18. OTHER		
19. NONE		
20. OTHER		
21. NONE		
22. OTHER		
23. NONE		
24. OTHER		
25. NONE		
26. OTHER		
27. NONE		
28. OTHER		
29. NONE		
30. OTHER		
31. NONE		
32. OTHER		
33. NONE		
34. OTHER		
35. NONE		
36. OTHER		
37. NONE		
38. OTHER		
39. NONE		
40. OTHER		
41. NONE		
42. OTHER		
43. NONE		
44. OTHER		
45. NONE		
46. OTHER		
47. NONE		
48. OTHER		
49. NONE		
50. OTHER		
51. NONE		
52. OTHER		
53. NONE		
54. OTHER		
55. NONE		
56. OTHER		
57. NONE		
58. OTHER		
59. NONE		
60. OTHER		
61. NONE		
62. OTHER		
63. NONE		
64. OTHER		
65. NONE		
66. OTHER		
67. NONE		
68. OTHER		
69. NONE		
70. OTHER		
71. NONE		
72. OTHER		
73. NONE		
74. OTHER		
75. NONE		
76. OTHER		
77. NONE		
78. OTHER		
79. NONE		
80. OTHER		
81. NONE		
82. OTHER		
83. NONE		
84. OTHER		
85. NONE		
86. OTHER		
87. NONE		
88. OTHER		
89. NONE		
90. OTHER		
91. NONE		
92. OTHER		
93. NONE		
94. OTHER		
95. NONE		
96. OTHER		
97. NONE		
98. OTHER		
99. NONE		
100. OTHER		

SECTION 3: HEALTH (CONT'D)

PID	4		5		6		7	
	How much of this was given with ...'s medication/consultation in the last two weeks? (GIVE AMOUNT IN KWACHA)	Was it given regularly?	GOVERNMENT DISTRICT 01 MISSION INDUSTRIAL 02 INDUSTRIAL 03 INDUSTRIAL 04 PRIVATE DISTRICT 04 PHARMACY/CHEMIST 05 PRIVATE 05 NEXIDON 07 TRADITIONAL HEALER 07 OTHER (SPECIFY) 08	Which health or other institution/personnel did you visit first for this illness/injury?	Was attended to during the illness 01 02 03 04 05 06 07 08 09 10 11 01 02 03 04 05 06 07 08 09 10 11 01 02 03 04 05 06 07 08 09 10 11

SECTION 3: HEALTH (CONT'D)

Q10	Q	P	DP	Q1
	What are the most common types of the condition in the family in the past?	What is the condition in the family in the past 12 months?	What are the most common types of the condition in the past 12 months?	Do you have this condition in the past 12 months?
				YES NO
	PREPARATION			
	SCIENTIFIC LOW COST..... 1		SCIENTIFIC LOW COST..... 1	
	SCIENTIFIC HIGH COST..... 2	YES... 1	SCIENTIFIC HIGH COST..... 2	
	SCIENTIFIC VERY HIGH COST..... 3	NO... 2	SCIENTIFIC VERY HIGH COST..... 3	
	SCIENTIFIC UNKNOWN..... 4		SCIENTIFIC UNKNOWN..... 4	
	SCIENTIFIC NONE..... 5		SCIENTIFIC NONE..... 5	
	SCIENTIFIC OTHER..... 6		SCIENTIFIC OTHER..... 6	
	SCIENTIFIC UNUSUAL..... 7		SCIENTIFIC UNUSUAL..... 7	
	SCIENTIFIC UNKNOWN..... 8		SCIENTIFIC UNKNOWN..... 8	
	SCIENTIFIC OTHER..... 9		SCIENTIFIC OTHER..... 9	
	SCIENTIFIC UNUSUAL..... 10		SCIENTIFIC UNUSUAL..... 10	
	SCIENTIFIC UNKNOWN..... 11		SCIENTIFIC UNKNOWN..... 11	
	SCIENTIFIC OTHER..... 12		SCIENTIFIC OTHER..... 12	
	SCIENTIFIC UNUSUAL..... 13		SCIENTIFIC UNUSUAL..... 13	
	SCIENTIFIC UNKNOWN..... 14		SCIENTIFIC UNKNOWN..... 14	
	SCIENTIFIC OTHER..... 15		SCIENTIFIC OTHER..... 15	
	SCIENTIFIC UNUSUAL..... 16		SCIENTIFIC UNUSUAL..... 16	
	SCIENTIFIC UNKNOWN..... 17		SCIENTIFIC UNKNOWN..... 17	
	SCIENTIFIC OTHER..... 18		SCIENTIFIC OTHER..... 18	
	SCIENTIFIC UNUSUAL..... 19		SCIENTIFIC UNUSUAL..... 19	
	SCIENTIFIC UNKNOWN..... 20		SCIENTIFIC UNKNOWN..... 20	
	SCIENTIFIC OTHER..... 21		SCIENTIFIC OTHER..... 21	
	SCIENTIFIC UNUSUAL..... 22		SCIENTIFIC UNUSUAL..... 22	
	SCIENTIFIC UNKNOWN..... 23		SCIENTIFIC UNKNOWN..... 23	
	SCIENTIFIC OTHER..... 24		SCIENTIFIC OTHER..... 24	
	SCIENTIFIC UNUSUAL..... 25		SCIENTIFIC UNUSUAL..... 25	
	SCIENTIFIC UNKNOWN..... 26		SCIENTIFIC UNKNOWN..... 26	
	SCIENTIFIC OTHER..... 27		SCIENTIFIC OTHER..... 27	
	SCIENTIFIC UNUSUAL..... 28		SCIENTIFIC UNUSUAL..... 28	
	SCIENTIFIC UNKNOWN..... 29		SCIENTIFIC UNKNOWN..... 29	
	SCIENTIFIC OTHER..... 30		SCIENTIFIC OTHER..... 30	
	SCIENTIFIC UNUSUAL..... 31		SCIENTIFIC UNUSUAL..... 31	
	SCIENTIFIC UNKNOWN..... 32		SCIENTIFIC UNKNOWN..... 32	
	SCIENTIFIC OTHER..... 33		SCIENTIFIC OTHER..... 33	
	SCIENTIFIC UNUSUAL..... 34		SCIENTIFIC UNUSUAL..... 34	
	SCIENTIFIC UNKNOWN..... 35		SCIENTIFIC UNKNOWN..... 35	
	SCIENTIFIC OTHER..... 36		SCIENTIFIC OTHER..... 36	
	SCIENTIFIC UNUSUAL..... 37		SCIENTIFIC UNUSUAL..... 37	
	SCIENTIFIC UNKNOWN..... 38		SCIENTIFIC UNKNOWN..... 38	
	SCIENTIFIC OTHER..... 39		SCIENTIFIC OTHER..... 39	
	SCIENTIFIC UNUSUAL..... 40		SCIENTIFIC UNUSUAL..... 40	
	SCIENTIFIC UNKNOWN..... 41		SCIENTIFIC UNKNOWN..... 41	
	SCIENTIFIC OTHER..... 42		SCIENTIFIC OTHER..... 42	
	SCIENTIFIC UNUSUAL..... 43		SCIENTIFIC UNUSUAL..... 43	
	SCIENTIFIC UNKNOWN..... 44		SCIENTIFIC UNKNOWN..... 44	
	SCIENTIFIC OTHER..... 45		SCIENTIFIC OTHER..... 45	
	SCIENTIFIC UNUSUAL..... 46		SCIENTIFIC UNUSUAL..... 46	
	SCIENTIFIC UNKNOWN..... 47		SCIENTIFIC UNKNOWN..... 47	
	SCIENTIFIC OTHER..... 48		SCIENTIFIC OTHER..... 48	
	SCIENTIFIC UNUSUAL..... 49		SCIENTIFIC UNUSUAL..... 49	
	SCIENTIFIC UNKNOWN..... 50		SCIENTIFIC UNKNOWN..... 50	
	SCIENTIFIC OTHER..... 51		SCIENTIFIC OTHER..... 51	
	SCIENTIFIC UNUSUAL..... 52		SCIENTIFIC UNUSUAL..... 52	
	SCIENTIFIC UNKNOWN..... 53		SCIENTIFIC UNKNOWN..... 53	
	SCIENTIFIC OTHER..... 54		SCIENTIFIC OTHER..... 54	
	SCIENTIFIC UNUSUAL..... 55		SCIENTIFIC UNUSUAL..... 55	
	SCIENTIFIC UNKNOWN..... 56		SCIENTIFIC UNKNOWN..... 56	
	SCIENTIFIC OTHER..... 57		SCIENTIFIC OTHER..... 57	
	SCIENTIFIC UNUSUAL..... 58		SCIENTIFIC UNUSUAL..... 58	
	SCIENTIFIC UNKNOWN..... 59		SCIENTIFIC UNKNOWN..... 59	
	SCIENTIFIC OTHER..... 60		SCIENTIFIC OTHER..... 60	
	SCIENTIFIC UNUSUAL..... 61		SCIENTIFIC UNUSUAL..... 61	
	SCIENTIFIC UNKNOWN..... 62		SCIENTIFIC UNKNOWN..... 62	
	SCIENTIFIC OTHER..... 63		SCIENTIFIC OTHER..... 63	
	SCIENTIFIC UNUSUAL..... 64		SCIENTIFIC UNUSUAL..... 64	
	SCIENTIFIC UNKNOWN..... 65		SCIENTIFIC UNKNOWN..... 65	
	SCIENTIFIC OTHER..... 66		SCIENTIFIC OTHER..... 66	
	SCIENTIFIC UNUSUAL..... 67		SCIENTIFIC UNUSUAL..... 67	
	SCIENTIFIC UNKNOWN..... 68		SCIENTIFIC UNKNOWN..... 68	
	SCIENTIFIC OTHER..... 69		SCIENTIFIC OTHER..... 69	
	SCIENTIFIC UNUSUAL..... 70		SCIENTIFIC UNUSUAL..... 70	
	SCIENTIFIC UNKNOWN..... 71		SCIENTIFIC UNKNOWN..... 71	
	SCIENTIFIC OTHER..... 72		SCIENTIFIC OTHER..... 72	
	SCIENTIFIC UNUSUAL..... 73		SCIENTIFIC UNUSUAL..... 73	
	SCIENTIFIC UNKNOWN..... 74		SCIENTIFIC UNKNOWN..... 74	
	SCIENTIFIC OTHER..... 75		SCIENTIFIC OTHER..... 75	
	SCIENTIFIC UNUSUAL..... 76		SCIENTIFIC UNUSUAL..... 76	
	SCIENTIFIC UNKNOWN..... 77		SCIENTIFIC UNKNOWN..... 77	
	SCIENTIFIC OTHER..... 78		SCIENTIFIC OTHER..... 78	
	SCIENTIFIC UNUSUAL..... 79		SCIENTIFIC UNUSUAL..... 79	
	SCIENTIFIC UNKNOWN..... 80		SCIENTIFIC UNKNOWN..... 80	
	SCIENTIFIC OTHER..... 81		SCIENTIFIC OTHER..... 81	
	SCIENTIFIC UNUSUAL..... 82		SCIENTIFIC UNUSUAL..... 82	
	SCIENTIFIC UNKNOWN..... 83		SCIENTIFIC UNKNOWN..... 83	
	SCIENTIFIC OTHER..... 84		SCIENTIFIC OTHER..... 84	
	SCIENTIFIC UNUSUAL..... 85		SCIENTIFIC UNUSUAL..... 85	
	SCIENTIFIC UNKNOWN..... 86		SCIENTIFIC UNKNOWN..... 86	
	SCIENTIFIC OTHER..... 87		SCIENTIFIC OTHER..... 87	
	SCIENTIFIC UNUSUAL..... 88		SCIENTIFIC UNUSUAL..... 88	
	SCIENTIFIC UNKNOWN..... 89		SCIENTIFIC UNKNOWN..... 89	
	SCIENTIFIC OTHER..... 90		SCIENTIFIC OTHER..... 90	
	SCIENTIFIC UNUSUAL..... 91		SCIENTIFIC UNUSUAL..... 91	
	SCIENTIFIC UNKNOWN..... 92		SCIENTIFIC UNKNOWN..... 92	
	SCIENTIFIC OTHER..... 93		SCIENTIFIC OTHER..... 93	
	SCIENTIFIC UNUSUAL..... 94		SCIENTIFIC UNUSUAL..... 94	
	SCIENTIFIC UNKNOWN..... 95		SCIENTIFIC UNKNOWN..... 95	
	SCIENTIFIC OTHER..... 96		SCIENTIFIC OTHER..... 96	
	SCIENTIFIC UNUSUAL..... 97		SCIENTIFIC UNUSUAL..... 97	
	SCIENTIFIC UNKNOWN..... 98		SCIENTIFIC UNKNOWN..... 98	
	SCIENTIFIC OTHER..... 99		SCIENTIFIC OTHER..... 99	
	SCIENTIFIC UNUSUAL..... 100		SCIENTIFIC UNUSUAL..... 100	

SECTION 6: INCOME FOR ALL PERSONS AGED 5 YEARS AND ABOVE, INCLUDING AGRICULTURAL INCOME

<p>1. Did any member of the household receive any income from the sale of the following crop produced crops?</p> <p>Yes 1 No 2 (if any crop)</p>		<p>2. How much income did all members of your household (combined) receive in the last 12 months from the sale of</p>	
	CROPS	AMOUNT IN WORDS (KWACHA)	AMOUNT IN FIGURES (KWACHA)
1	Hybrid Maize _____		_____
2	Local Maize _____		_____
3	Cassava _____		_____
4	Groundnuts _____		_____
5	Rice _____		_____
6	Millet _____		_____
7	Sorghum _____		_____
8	Bean _____		_____
9	Soya beans _____		_____
10	Sweet Potatoes _____		_____
11	Irish Potatoes _____		_____
12	Vegetables _____		_____
13	Cotton _____		_____
14	Others _____		_____
15	Net Income _____		_____

SECTION 6: INCOME FOR ALL PERSONS AGED 5 YEARS AND ABOVE, INCLUDING AGRICULTURAL INCOME (Cont'd)

1. Did any member of this household receive any income from the sale of the following poultry		1. How many were consumed by all members of your household in the last twelve (12) months?		1. How much income did all members of your household (combined) receive from the sale of in the last twelve (12) months
Yes.....1		No.....2		
POULTRY		NUMBER SOLD/CONSUMED		INCOME FROM SALES OR VALUE OF CONSUMPTION [KWACHA]
23.1	Sale of <i>oona</i> chickens			
23.2	<i>Oona</i> chickens consumed			
23.3	Sale of <i>oona</i> guinea fow	<input type="checkbox"/>		
23.4	<i>Oona</i> guinea fow consumed	<input type="checkbox"/>		
23.5	Sale of <i>oona</i> ducks and geese			
23.6	<i>Oona</i> ducks and geese consumed	<input type="checkbox"/>		
23.7	Sale of <i>oona</i> turkeys			
23.8	<i>Oona</i> turkeys consumed	<input type="checkbox"/>		
23.9	Sale of <i>oona</i> rabbits	<input type="checkbox"/>		
23.10	<i>Oona</i> rabbits consumed			
23.11	Sale of <i>oona</i> pigeons	<input type="checkbox"/>		
23.12	<i>Oona</i> pigeons consumed			
23.13	Sale of <i>oona</i> quails	<input type="checkbox"/>		
23.14	<i>Oona</i> quails consumed	<input type="checkbox"/>		
23.15	Sale of <i>oona</i> eggs	<input type="checkbox"/>		
23.16	<i>Oona</i> eggs consumed	<input type="checkbox"/>		
OTHER FARMING INCOME				

SECTION 4: INCOME FOR ALL PERSONS AGED 5 YEARS AND ABOVE (Cont'd)

PH	38 How much non regular allowances did you receive last month, that is, overtime payments, insurance allowance, bonus, etc. from your main job?	39 How much is your regular gross monthly salary/wage including regular allowances such as housing and transport allowances, regular overtime, retention allowance, from your second job?	40 How much are regular allowances did you receive last month, that is overtime payments, insurance allowance, bonus, etc. from your second job?																				
<input type="checkbox"/>	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					_____	_____
<input type="checkbox"/>	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					_____	_____
<input type="checkbox"/>	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					_____	_____
<input type="checkbox"/>	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					_____	_____
<input type="checkbox"/>	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					_____	_____
<input type="checkbox"/>	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					_____	_____
<input type="checkbox"/>	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					_____	_____
<input type="checkbox"/>	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					_____	_____
<input type="checkbox"/>	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					_____	_____
<input type="checkbox"/>	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					_____	_____

SECTION 6. INCOME FOR ALL PERSONS AGED 5 YEARS AND ABOVE. (Cont'd)

FID	27. How much interest on savings and loan accounts in the last month?	28. How much interest on dividends on stocks, securities, bonds, treasury bills, etc. was received during the last 12 months?	29. How much interest on bonds from any other source in month?																																																												
_____	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																				
_____	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																				
_____	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																				
_____	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																				
_____	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																				
_____	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																				
_____	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																				
_____	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																				
_____	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																				
_____	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																					<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																				

LAST 2 WEEKS	PURCHASE				OWN PRODUCTION				UNIT CODES	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
	Did this household purchase any items during the last 2 weeks?	During the last 2 weeks, how much did your household purchase (TOTAL) (IN TONNES)?	How many (UNIT S) of (FPM) did your household purchase that amount?	During the last 2 weeks, how many (UNIT S) of your produce (FPM) did your household consume?	During the last 2 weeks, how much would this (FPM) cost if purchased today?	How much would this (FPM) cost if purchased today?	During the last 2 weeks, how many (UNIT S) of household member's produce did you purchase?	How much would this (FPM) cost if purchased today?	UNIT CODES	UNITS
READ OUT	100									
TILL REPORT ROW		VALUE IN KWACHA	QUANTITY	UNIT CODE	QUANTITY	UNIT CODE	VALUE IN KWACHA	QUANTITY	UNIT CODE	VALUE IN KWACHA
Meat and Poultry										
16	Beef (fresh)									
17	Beef (frozen)									
18	Beef (dried)									
19	Goat meat (fresh)									
20	Goat meat (frozen)									
21	Goat meat (dried)									
22	Sheep meat (fresh)									
23	Sheep meat (frozen)									
24	Sheep meat (dried)									
25	Game meat (fresh)									
26	Game meat (frozen)									
27	Game meat (dried)									
Dairy Products and Eggs										
28	Milk (fresh)									
29	Milk (sterilized, in tins, milk)									
30	Eggs									
31	Other dairy products									
Fats										
32	Butter									
33	Margarine									
34	Other fats (and cooking oil)									
Sugar and Sweeteners										
35	Sugar									
36	Honey									
37	Other sweeteners									
38	Other sweeteners									
39	Other sweeteners									
40	Other sweeteners									
41	Other sweeteners									
42	Other sweeteners									

UNIT CODES	UNITS
000	NO PURCHASE
010	KG BARRAN
020	KG BARRAN
030	KG BARRAN
040	KG BARRAN
110	KG LITRE TIN
120	KG LITRE TIN
130	KG LITRE TIN
140	KG LITRE TIN
150	KG LITRE TIN
160	KG LITRE TIN
170	KG LITRE TIN
180	KG LITRE TIN
190	KG LITRE TIN
200	KG LITRE TIN
210	KG LITRE TIN
220	KG LITRE TIN
230	KG LITRE TIN
240	KG LITRE TIN
250	KG LITRE TIN
260	KG LITRE TIN
270	KG LITRE TIN
280	KG LITRE TIN
290	KG LITRE TIN
300	KG LITRE TIN
310	KG LITRE TIN
320	KG LITRE TIN
330	KG LITRE TIN
340	KG LITRE TIN
350	KG LITRE TIN
360	KG LITRE TIN
370	KG LITRE TIN
380	KG LITRE TIN
390	KG LITRE TIN
400	KG LITRE TIN
410	KG LITRE TIN
420	KG LITRE TIN
430	KG LITRE TIN
440	KG LITRE TIN
450	KG LITRE TIN
460	KG LITRE TIN
470	KG LITRE TIN
480	KG LITRE TIN
490	KG LITRE TIN
500	KG LITRE TIN
510	KG LITRE TIN
520	KG LITRE TIN
530	KG LITRE TIN
540	KG LITRE TIN
550	KG LITRE TIN
560	KG LITRE TIN
570	KG LITRE TIN
580	KG LITRE TIN
590	KG LITRE TIN
600	KG LITRE TIN
610	KG LITRE TIN
620	KG LITRE TIN
630	KG LITRE TIN
640	KG LITRE TIN
650	KG LITRE TIN
660	KG LITRE TIN
670	KG LITRE TIN
680	KG LITRE TIN
690	KG LITRE TIN
700	KG LITRE TIN
710	KG LITRE TIN
720	KG LITRE TIN
730	KG LITRE TIN
740	KG LITRE TIN
750	KG LITRE TIN
760	KG LITRE TIN
770	KG LITRE TIN
780	KG LITRE TIN
790	KG LITRE TIN
800	KG LITRE TIN
810	KG LITRE TIN
820	KG LITRE TIN
830	KG LITRE TIN
840	KG LITRE TIN
850	KG LITRE TIN
860	KG LITRE TIN
870	KG LITRE TIN
880	KG LITRE TIN
890	KG LITRE TIN
900	KG LITRE TIN
910	KG LITRE TIN
920	KG LITRE TIN
930	KG LITRE TIN
940	KG LITRE TIN
950	KG LITRE TIN
960	KG LITRE TIN
970	KG LITRE TIN
980	KG LITRE TIN
990	KG LITRE TIN

DURATION OF REFERENCE PERIOD		PURCHASES			OWN PRODUCTION			CFHS, FOOD FOR WORK, RELIEF FOOD		
LAST 4 WEEKS	Q8	Q9	Q10	Q11	Q12	Q13	Q14			
	Did this household purchase/consume/produce during the last 4 weeks?	During the last 4 weeks, how much did your household spend on ITEM? (IN TOTAL)	How many (UNITS) of ITEM did your household purchase for that amount?	During the last 4 weeks, how many (UNITS) of own produced ITEM did your household consume?	How much would this ITEM cost if you were to buy it?	During the last 4 weeks, how many (UNITS) of ITEM did your household receive without payment?	How much would this ITEM cost if you were to buy it?			
READ OUT	YES									
FILL IN PER ROW	NO									
	⇒ NEXT ITEM									
	DONT KNOW ⇒ NEXT ITEM									
		VALUE IN KWACIA	QUANTITY	UNIT CODE	QUANTITY	UNIT CODE	VALUE IN KWACIA	QUANTITY	UNIT CODE	VALUE IN KWACIA
Non-Frequent Items										
DURING LAST FOUR WEEKS										
32	Salt									
36	Sugar									
37	Cooking Oil									
Other non-frequent expenditure										
DURING LAST FOUR WEEKS										
38	Charcoal									
39	Firewood									
40	Rent of dwelling									
41	Water & sewerage charges									
42	Electricity									
43	Paraffin									
44	Diesel (for lighting and cooking only)									
45	Home repairs (plumbing, painting, stove repairs etc)									
46	Cable pay TV (DSTV, My TV, SATELLITE, ZNBC, etc)									

Section 11A: Household Expenditure

		PURCHASES	GIFTS
		Q4	Q11
LAST 4 WEEKS	Did this household purchase or receive the below items during the last 4 weeks?	During the last 4 weeks, how much did your household spend on [ITEM]? (IN TOTAL)	During the last 4 weeks, what was the value of [ITEM] your household received without payment? (IN TOTAL)
READ OUT	YES		
	NO		
	GO NEXT ITEM		
	DON'T KNOW		
FILL IN PER ROW	GO NEXT ITEM		
		VALUE IN KWACHA	VALUE IN KWACHA
179	Entertainment (eg cinema, disco, watching sport, boxing, video hire, visits to entertainment centres eg adventure city, zoo, alcohol)		
180	Desserts, confectionery		
181	Stationery (eg copies, printing paper, envelopes, used stationery for education)		
182	Typing services, filling in official forms		
183	Other expenses		

Section 11A: Household Expenditure

NOTE: CHANGE OF REFERENCE PERIOD

		PURCHASES	GIFTS
		Q12	Q17
LAST YEAR	Did this household purchase/pay for or receive the following items during the last year 2009?	During the last year (2009) how much did your household spend on [ITEM]? (IN TOTAL)	During the last year, what was the value of [ITEM] your household received without payment? (IN TOTAL)
READ OUT	YES		
	NO		
	GO NEXT ITEM		
	DON'T KNOW		
FILL IN PER ROW	GO NEXT ITEM		
		VALUE IN KWACHA	VALUE IN KWACHA
EDUCATION, AND WHERE SEPARATELY FOR 1ST, 2ND AND 3RD SCHOOL TERMS OF 2009			
184	School fees (including examination fees, & boarding fees)	100 000	100 000
185	Contributions to school / PTA	200 000	200 000
186	Private tuition	100 000	100 000
187	Tuition fees	100 000	100 000
188	School stationery (exercise books, pens, pencils, rulers, folders, mathematical tools, books, paper, etc)	100 000	100 000
189	Purchase of other school requisites (e.g. for boarders - mats, matts, blankets, covered bowls, etc)	100 000	100 000
190	Other education expenses (graduation ceremonies, rack shops, uniforms, pocket money for students, boarding, and boarding for students, remittances to students)	100 000	100 000

Section 11A: Household Expenditures

	PURCHASES		GIFTS	
	Q17	Q18	Q19	Q20
LAST YEAR	Did this household purchase any for or receive the following items during the last year (2009)?	During the last year (2009), how much did your household spend on (TOTAL)?	During the last year, what was the value of (TOTAL) gifts your household received (TOTAL)?	During the last year (2009), what was the value of (TOTAL) gifts your household received (TOTAL)?
READ OUT	YES			
	NO			
	DO NOT KNOW			
FILE IN THE BOX	DO NOT WRITE	VALUE IN DOLLARS	VALUE IN DOLLARS	
191	Books of medicines			
192	Prescription medicines			
193	Over-the-counter medicines			
194	Lease for dentists			
195	Lease for hospital stays			
196	Lease for health insurance			
197	Lease for health insurance (Medicare)			
198	Payments for hospital or health center contact			
199	Out-of-pocket charges			
200	Other health expenses			
WATER				
201	Telephone service (landline)			
202	Cellular service			
203	Other internet service			
LAUNDRY				
DOES CLOTHING, SHOES, REPAIRS - KID'S LAUNDRY, KID'S SCHOOL UNIFORMS				
204	Children's clothing			
205	Children's shoes			
206	Men's clothing			
207	Women's clothing (not children's)			
208	Textile services			
209	Tailoring charges			
210	Dry cleaning (not shoes, coats, uniforms, etc.)			

Section 11B: Household Expenditures

	PURCHASES		GIFTS	
	Q21	Q22	Q23	Q24
LAST YEAR	Did this household purchase any for or receive the following items during the last year (2009)?	During the last year (2009), how much did your household spend on (TOTAL)?	During the last year, what was the value of (TOTAL) gifts your household received (TOTAL)?	During the last year (2009), what was the value of (TOTAL) gifts your household received (TOTAL)?
READ OUT	YES			
	NO			
	DO NOT KNOW			
FILE IN THE BOX	DO NOT WRITE	VALUE IN DOLLARS	VALUE IN DOLLARS	
FINANCIAL SERVICES				
712	Bank deposits			
713	Contributions (Charity, religious, etc.)			
714	Insurance (not life, health)			
715	Financial advice services			
Section 11C: Entertainment				
LAST YEAR	During the last year (2009), did your household spend any amount on each of the following items?	During the last year (2009), how much did your household spend on each of the following items?	During the last year (2009), what was the value of each of the following items?	During the last year (2009), what was the value of each of the following items?
READ OUT	YES			
	NO			
	DO NOT KNOW			
FILE IN THE BOX	DO NOT WRITE	VALUE IN DOLLARS	VALUE IN DOLLARS	
ENTERTAINMENT				
810	To persons in residence of family (not any member of the household)			
811	To persons in other part of family (not any member of the household)			
812	To persons outside family			