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**DETERMINANTS OF EQUITABLE ALLOCATION OF FUNDS TO
PUBLIC HOSPITALS IN KENYA**

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Student's Declaration:

This project report is my original work and has not been presented for a degree in any other University.

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Supervisor's Declaration

I confirm that this research project was carried out by the candidate under my supervision

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Abstract.

One of the key funding objectives is equity. A snapshot of the country's health outcomes indicates some disparities. Underlying this is the way funds are allocated. Provision of medical services is carried out by health facilities. As is the case in other developing countries, hospitals tend to dominate the health system. The government usually provides financial support to all public hospitals which are meant to protect the catchment population against social and economic consequence of ill health. Subsidiary legislation has also been issued to govern management of hospital funds in the country. The focus of this study was to determine if the public hospital resource allocation practice takes into consideration the differences in levels of need for different counties and also to describe the preexisting political, economic and social conditions under which people engage in procedure and benefit distribution. A cross sectional study design was used to address the research objectives adequately. This was a descriptive study which aims to answer the basic 'W' questions – Who Where, What, When, What, Why and so what? as contained in the study's objectives. All the 47 Counties were targeted. The findings of this study indicate that the current basis for allocation differs with what has been recommended under the Commission on Revenue Allocation criteria. It's heavily dependent on utilisation data. Comparison of share of a county hospital fund and the share of devolved funds indicated that poor counties receive fewer hospital funds than their equity target. Regression analysis showed that increase in funding over the last 4 years was mainly based on utilisation data and hospital size. Most of the other determinants were ignored. The qualitative findings also correlated these results. Respondents felt that HIV and rural population groups should be prioritised as well as poverty and size of the hospital in resource allocation. Inadequate resources were seen as the key obstacle in achieving an equitable distribution of resources.

Abbreviations and Acronyms

| | |
|--------|-----------------------------------|
| CRA- | Commission on Revenue Allocation |
| DH- | Department of Health in UK |
| FH- | Financial Year |
| GOK – | Government of Kenya |
| HMSF – | Hospital Management Services Fund |
| MOH – | Ministry of Health |
| UK- | United Kingdom |
| USA- | United States of America |
| WHO – | World Health Organization |

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Definition of terms

Allocation practice- refers to the process of distribution of resources in a certain organization unit. This could be grounded on traditions, directives or a formal legal framework.

Criterion – refers to a democratically determined standard of judging how resources will be shared.

Equity- it's the idea of fairness or justice in allocation of resources.

Health system- it's the complete network of agencies, facilities, and all providers of health care in a specified geographic area. The main goal of a health system is to improve its target population's health status.

Hospital- defined as a health facility with capacity to provide both curative and preventive health services. It refers to sub-district, district and provincial hospital.

Need- refers to the population characteristics that determine its capacity to benefit from utilization of healthcare.

Social justice- it involves considerations of both joint and individual rights and obligations. It's about empowerment of the weak to enable them clamor or claim their share or rights.

Vertical equity- this notion refers to the unequal treatment of unequal. In respect to resource allocation, those with greater health needs should be allocated enough resources to cater for their increased demand for health services.

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Chapter One

INTRODUCTION

1.1 Background

Kenya has made some progress towards realization of vision 2030 and millennium development goals. To guide these efforts, the country has anchored strong protections for economic and social rights in its 2010 Constitution(GOK 2010; CESR 2012).

However, the economic and social development has been unevenly distributed(CESR 2012). A factor that was blamed for the internal crisis the country went through in 2007/08.The health sector has not been spared by these disparities. According to the 2008 demographic survey, the infant mortality rate and under five mortality rates are 52 and 74 respectively. Five regions (provinces) in the country recorded a higher rate than the country's average something that was also evident in 2003(GOK 2003; GOK 2009). Some of the regions such as Nairobi and Central provinces have recorded accelerated health development as indicated by the low maternal and infant mortalities signifying a major social inequity in both maternal and infant mortality(GOK 2003; GOK 2009).

Equity has several dimensions but usually refers to comparable access to health services for all population groups. Studies on equity of public health care services availability have also pointed to uneven distribution and access to health services in the country(Watt 2002; Toda 2012). This ties closely to the realization that the availability of good medical care tends to vary inversely with the need for it in the population served(Watt 2002). Study findings indicate that deprived areas are likely to receive less or same resources as stable

places resulting in poor health performance by teams offering hospital services. They also receive less attention from researchers and epidemiologist(Watt 2002).

Today, there is a growing recognition of the importance of equity to development, and many development agencies and ministries recognize equity as a central goal for their programming(Jones 2009). As stated by Mooney *'the vertical equity road is appealing in so far as it allows not only for positive discrimination for those at the bottom of the heap but for a just solution for everyone at all levels'*(Gavin 2000).

The National Health Service (NHS) in United Kingdom (UK) was the first health system to attempt to distribute resources based on population need. The Resource Allocation Working Party (RAWP), in 1976, recommended that the distribution of the resources be based on a formula. The *'demographically older populations'* were seen to be in greater need for health resources(Sheena 2004).

In a competitive insurance markets such as in the United states of America (USA) purchasing of health services is based on capitation or fee for service methods. Capitation method tend to dominate purchasing in countries with a social insurance model(Lorna 2011).In countries without a predetermined formula, allocation of resources is based on historical budgets which are mainly influenced by supply and demand for services(Diderichsen 2004; Lorna 2011).

In Uganda, need is defined based on the human development index. This indicator forms the basis of the formula. In South Africa the formula is based on the indexes of deprivation(Gilson 2000; Diderichsen 2004).

In the Ministry of Medical services, promoting equity is an explicit goal (GOK 2012). Health services are regarded as essential and as part of human rights. Equity is an important

ingredient for human rights because- it is about justice or fairness. It refers to the distribution of the costs of health services and the benefits obtained from their use between different groups in the population(Nick 2010). In the Ministry of Medical services it concerns parity or lack of it in the way finances and other resources are allocated by those in authority. The health systems provide the means through which the health services are delivered. Health systems are socially constructed and thus are central strategies at eliminating social inequity and social injustice(Gilson 2011). As noted by Germano, since health outcomes cannot be redistributed, society can improve equity in health by coming up with policies that influence how inputs such as resources can be redistributed(Mwabu 2007). Tracking progress on who receives benefits and how the funding is deployed can provide evidence on the equity achieved by a particular health system.

Developing countries Health Systems are dominated by hospitals. These Public hospitals consume large amount of the Ministry's resources(Mills 1990). In the country the system is a hierarchical-pyramidal organization comprising six levels, the lowest being the village dispensary while the National Hospitals are at the apex (Wamai 2009). Source of healthcare financing in public hospitals have under gone major transformation. In 1992 a cost-sharing system was introduced to leverage more resources for health services. These cost sharing funds are often insufficient to support all hospital operations. To supplement the cost sharing funds the Ministry also allocates money to hospitals. These funds are allocated and sent directly to the hospitals(Sector 2011). In an attempt to address equity and management issues affecting hospital financing the government introduced a policy action named Hospital Management Services Fund (HMSF) in 2010. This policy introduced

a resource allocation formula targeting all the current 268 Hospitals. The formula includes variables related to population structure, disease burden, infrastructure, poverty levels, utilization patterns and hospital capacity. However, no criterion was established for geographic allocation of resources. The formulas are rarely used and historical incremental approach is the main basis for resource allocation(Chuma 2011).

In 2012/13 Financial Year, the Ministry of Health received KSH 85billion of which KSH 44.15 Billion was allocated to Ministry of Medical Services (Hospital Program) and KSH 40.85 Billion to Ministry of Public Health (Nonhospital programs)(Parliament 2012/13).This is considered to represent a fair share of resources between hospital and nonhospital programs(Parliament 2012/13).

The current methods of monitoring health resources allocation and equity gives a lot of attention to this indicator(allocation of funds between hospital and nonhospital programs) which often obscure large gaps between social groups within the country(Braveman 1997). It also fails to take into account that Hospital provides both hospital care and primary healthcare services and thus are key players in delivery of basic health care package in developing countries. Hospitals also play the lead provider role in a District Health System. Recurrent and development funds allocations are a significant source of funding for public hospitals. It represents the main avenue for investments in health infrastructure by the government. The fund also presents opportunity and resources to level up equity. The other inputs (Human resources, medical products and supplies) are mainly allocated depending on the status of the health facilities.

The distribution of Hospitals in the country is guided by the National Health Sector Strategic plan II through the Kenya essential Package for health which provides guidelines

on the size of catchment population for each type of facility. According to the norms, the dispensaries should have a catchment population of 10, 000 to 15,000, health centers 50,000 to 70,000 , and hospitals 250,000 people(GOK 2004).

With the introduction of the new constitution, Kenyan public healthcare system will undergo a major transformation. The health system will comprise of the National ministry of Health and 47 county health systems. County governments will be responsible for provision of health services signaling a shift in power and influence in the policy process. These new administrative structures will require evidence to guide resource allocations in their counties to ensure equity is promoted and upheld.

The Commission on Revenue allocation (CRA) as mandated by the constitution has set out a criterion for identifying marginalized areas in the country. This criterion is aimed at guiding planning and implementation in all government departments. The county development index is a quantitative method of ranking counties based on need or well being (see appendix 3).

However, current research literature has not looked into how the government is making its health investments vis a vis current legal framework meant to promote equity. Neither has it looked into how the concept of equity in resource allocation is understood nor the premium attached to it by the system. It has also not dealt with health inequity among the marginalized populations (where available it deals with specific conditions rather than the whole system) who have the greatest degree of health needs because these areas are inaccessible. As a result current policies aimed at addressing inequity in health may have failed to take into account the differences in need. Without an all inclusive and justice framework (a good formula to determine allocation) promotion of an overall resource

allocation will continue to be undermined. Many Kenyans may continue to be disadvantaged in their access to health services based on their place of residence and the state of the public hospitals serving their locality. Given these concerns, it's worthwhile to clearly describe and analyze the allocation of recurrent and development funds by the ministry of health.

Current literature recommends that to arrive at a just framework, the key question should be- What is to be equalized? Then the relative need should then be documented to guide the process. Closing any inequity gap requires action on causes through a pragmatic policy to ensure these funds reach the facilities with the greatest need(Diderichsen 2004). This study will look at equity in public hospital financing.

1.2 Statement of the Problem.

Inequity in health is a hot issue for all governments. Governments have an obligation to promote and maintain the health status of all of its Citizens(Paul 2004). This calls for proper management of scarce resources and Health care. The Kenya government appreciates the link between health and development as evidenced by the move to protect health rights and social justice in the current constitution(GOK 2010).

One of the Key pillars in a health system is health care financing. The Ministry of Health funds Hospitals directly. The model applied in financing of the health facilities has some bearing on distribution of services (access) and utilization of healthcare services in different parts of the country (Diderichsen 2004; Chuma 2011).This would in turn affect the health status of the population. Indeed, funds allocated to the hospitals are meant to

protect the catchment population against social and economic consequences of ill health(Diderichsen 2004).

Previous Studies in seven African nations have shown that the richest quintile relative to need receives more than six times more care than the poorest quintile (Diderichsen 2004).The Demographic and Health Surveys in Kenya have also demonstrated disparity in Health status(Braveman 1997; GOK 2009; HERAF 2011). Behind all this is the way resources are allocated to health care institutions and populations.

The allocation of financial resources (for Recurrent and Development Expenditure) to hospitals can have implications for distribution and access of benefits from public resources as evidenced by the disparity in Health status in the country(Howard 1993).

The study was motivated by the realization that despite this strong commitment by the government to promote equity, implementation of the current legal framework has been slow(Chuma 2011) and current studies on health services continue to record pockets of inequity in the country(GOK 2009; HERAF 2011). This study investigated whether the allocation practice for hospital fund is equitable and also looked at the determinants that inform resource allocations in public sector hospital financing.

1.3 Research Questions

1. What is the basis for distribution of hospital funds at the ministry of health?
2. Does the current hospital fund allocation practice lead to equitable distribution based on levels of need for different counties?
3. How is the current construction of equitable resources allocation practiced?

1.4 Objectives of the Study

1. To determine the intended basis for distribution of hospital funds at the ministry.
2. To establish whether the basis used in allocation leads to equitable distribution.
3. To describe the current construction of equitable resources allocation practice at the ministry of health.

1.5 Assumptions

1. The allocation of hospital funds at the Ministry is based on level of needs.
2. Allocation of hospital funds does not result in equitable distribution.
3. The actual allocation practice at the Ministry is influenced by the technical heads perceptions and understanding.

1.6 Justification and Significance

The findings of this study have shed some light on the weaknesses and strengths in the current distribution practice for hospital funds and its effect on equity. This can also improve the understanding on how subsequent allocation of other resources is effected.

Analysis of equity effects have been overlooked in our health sector. There are limited studies or evaluation on this topic in our set up. Most of the studies concentrate with horizontal equity. This study has a number of potential benefits to the policy makers. The study can offer evidence about equity effects in hospital allocation practice at the ministry. This study has demonstrated how counties with different needs are treated during allocation. These findings can also guide the new County health management teams (devolved units) on how to set up an appropriate allocation practice and the importance of

pursuing vertical equity as a system goal so as to ensure all sub-county areas needs are catered for. These findings can also provide a concrete rallying point for stakeholders' intent on lobbying for improvement in allocation practice.

Use of health surveys in assessment of equity is a very expensive affair particularly in a poor resource setting. As a result researchers tend to carry out the analysis in a sporadic manner. This study has demonstrated how readily available administrative data can be used in the analysis of equity at the ministry. An appropriate framework for analysis equity has also been proposed which can be used in future analysis. By employing the principle of triangulation, the study has highlighted how qualitative and quantitative methodologies can be combined in poor resource setting to allow for a comprehensive analysis of equity.

Overall, the information (findings) obtained from this study can add to the literature on vertical equity in sub-Saharan Africa.

1.7 Scope and limitations

This study looked at the distribution of funds appropriated under the Hospital Management Services funds. These funds are meant to support hospital operations. The study used qualitative means to look at the process and the procedure of allocating the funds and how those who are responsible for implementing the policy understands and perceives it.

However, the study did not look into other expenditures such as those meant for human resources and medical supplies. Data pertaining to these expenditures were of poor quality and in some cases were unavailable. The site of the study was at the ministry of health headquarters since the secretariat that is responsible for allocating funds is located here.

Allocations to hospitals were aggregated at the county level. This data was readily available at the ministry headquarters. Private hospitals were not included in this study. Due to time and resources constraints, the study concentrated on the stated objectives only.

The remaining 4 chapters illustrate how the objectives of this study were tackled. In chapter 2, we conducted a review of the relevant literature so as to show the academic foundation of our study as well as the gaps. In chapter 3 we provide a detailed summary of the methods we employed to meet the objectives. In chapter 4, we analyze the data we collected using the methods described in the previous chapter. The last chapter provides a detailed discussion of the findings as well as their relevance to our public health system. This chapter concludes with a set of recommendations to the policy makers.

Chapter Two

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Literature Review:

2.1.1 The ideology and framework meant to guide equity;

The Health of a population is widely recognized to have two dimensions; the health status and how the health is distributed within a population(Erik 2011). The latter has attracted considerable attention from governments and the international community since 1978 which has culminated in a Rio political declaration in 2011 in which all governments committed to fight avoidable and unfair disparities in health status(WHO 2011). As a result, in both high income and low income countries, health equity is a key health system performance measure. As argued in a KIPPRA working paper, governments have a key role to play to address equity in distribution and coverage for services. Indeed, application of health economics to address equity questions in sub-Saharan Africa can *'provide an opportunity to generate research information that policy makers can use directly to improve health or enhance performance of their healthcare systems'* (Mwabu 2007). Overall, *'the government will continue to play a dominant role in health care financing in Africa over the next several decades because institutions that support private health care financing such as private insurance schemes do not as yet exist in many parts of Africa'* (Mwabu 1998).

Equity is also an important ingredient for human rights because- it is about justice or fairness. It refers to the comparable distribution of the costs of health services and the benefits obtained from their use between different groups in the population (Nick 2010).

As noted above, it's a hot issue for all Governments and WHO has underscored this by emphasizing that *"the distribution of health within a population is a matter of fairness in the way economic and social policies are designed"* (Erik 2008).

In all corners of the world, Health systems are widely recognized to be vital elements of the social fabric of every society. Health systems are socially constructed and provide the means through which the health services are delivered. They thus, can play a key role at eliminating social inequity and social injustice (Gilson 2011) . The organizational and financial arrangements of health systems play a critical role in improving health service access and protecting households from severe financial loss (Okunga 2003; Gakuruh 2008). The prevailing financial arrangements are a result of policies made over the years (Paul 2004). It has also been established that accountability, transparency and vigorous citizen participation are essential for improving the financial arrangements which can in turn result in equity in health (Martyn 2008). The United Kingdom was the first country to attempt to address equity through an allocation formula through creation of a resource allocation working group in 1976 (Sheena 2004). Equitable allocation of resources requires the identification of criteria. Some of these key determinants of health include population, gender, under five population, literacy levels, poverty, income levels, safe water supply and AIDS (Mwabu 1998). A number of countries in Sub-Saharan Africa has taken these determinants into consideration (EQUINET 2012) with a variety of formulae aimed at guiding allocation of funds based on the prevailing political ideology.

These determinants can either be a direct or indirect measure of health need. Mortality and morbidity data can be used as a measure of relative need. These data are generated in the health sector. In UK, it was initially the main factor but currently is used in combination

with other direct measure of need.

Socioeconomic indicators have also been shown to be related to need. These measures are helpful in low income countries which have weak health information system and thus unreliable hospital statistics(Diderichsen 2004).

Women health is also a key development agenda in the Africa region due to their unique position in society. This cohort also carries a huge burden of disease characterized by high mortality rates. As a result WHO recommends that women health should be taken at the highest political level(WHO 2012).

Following the promulgation of the new constitution in Kenya, the Commission on Revenue Allocation (CRA) has the constitutional mandate for providing a rationale and methodology for vertical resource allocation in the country. This is captured in its mission statement *‘To make expert recommendations on equitable sharing of revenue for both national and county governments’*. The current allocation criteria includes population, land area, poverty, equal share and fiscal responsibility(CRA 2012).

2.1.2 Variation in equity effects;

However, previous studies on availability of health care services(Wamai 2009; Sector 2011; Toda 2012) shows that inequalities are a major feature of the health system(Okunga 2003). A study in seven African nations has shown that the richest quintile relative to need receives more than six times more care than the poorest quintile (Diderichsen 2004). In reference to resource allocation, South African case represent a good case to demonstrate how inappropriate resource allocation can result in inequity where by the infant mortality rates among the blacks was 6 times higher than the white counterparts(Nyanjom 2008).

Other studies have demonstrated positive effects. In a study in Tanzania, Mutovu et al demonstrated that allocation of bed nets was vertically equitable whereby the utilization among the under fives was higher than the over fives age group (Mutovu 2009). A study in Taiwan also demonstrated that *'people who had greater health need use more health care resources and services conforming to the principle of vertical equity'* (Shio-Ing 2013).

In Kenya, studies on equity of public health care services availability have also pointed to uneven distribution and access to health services in the country (Watt 2002; Toda 2012).

In both 2003 and 2008 Health and demographic survey high productive areas such as Nairobi, Central, Eastern and some parts of Rift Valley provinces recorded low maternal, infant and under five mortalities while the rest of the provinces recorded rates that were higher than the national average (GOK 2003; GOK 2009). Only Nairobi and Central provinces have recorded consistent decline in these rates between 1998 to 2009 (Nyanjom 2008). A trend analysis done by Nyanjom in 2008 indicated some disparity in rural and urban health status with rural areas recording higher mortality rates. These regions also have a higher number of facilities per capita. This correlates well with the argument that the availability of good medical care tends to vary inversely with the need for it in the population served (Watt 2002).

2.1.3 Pull and push factors influencing distribution of funds;

Some of the drivers of this inequity are the colonial inheritance, Urban-Rural divide, regional, ethnic and sex discrimination as well as favoring of the high productivity areas (SID 2010). These can impact on financial resources allocation and distribution which in turn determine whether healthcare delivery is equitable or cost effective. Central to this

inequity is that resource allocation decisions are centralized and highly opaque relying mainly on historical and incremental approach(USAIDS 2010). This is despite presence of a recommended legal framework for equity(Loewensen 2012). Studies have documented that poor people or deprived areas continue to suffer from poor health status and lack of food and other amenities despite the authorities efforts to promote these amenities in the society(Nyanjom 2008; Loewensen 2012). McIntyre work is helpful in demonstrating how deprivation indicators can be used to guide resource allocation. In his study, he also noted that despite application of an 'equitable share formula' in South Africa the needy areas never get a fair share of resources(Mcintyre 2002). A study in Ghana arrived at a similar conclusion; *'that the disadvantaged districts could not secure a fair share of resources based on need since the resource allocation practice between 1999 to 2002 aimed at distributing resource allocation equally to all districts contrary to policy imperative of allocating funds based on need'* (Augustine 2006). Another study in Ghana whose aim was to explore the factors that influence resource allocation decisions and affect equity of funding allocation in the health sector of Ghana demonstrated that allocation of financial resources in the health sector is not merely the application of specific formulae to share a certain amount of resources between competing needs. That decision makers make resource allocation decisions based on a wide range of factors that may not necessarily be accounted for in an existing formula (Asante 2009) .

In Kenya a study by Jane Chuma concluded that benefits are not distributed according to need(Jane 2012). A previous study stated that the health care financing sources in Kenya does not favor the poor and the out of pocket payment was regressive. According to the Kenya National Health Account report, the out of pocket payments constitute about 30% of

the total health budget(Health2020 2009). Indicating that the Kenyan system relies a lot on out of pocket payment whereby the poor tends to contribute a larger portion of their income to healthcare than the rich. Other government resources were also noted to be distributed according to a historical incremental approach(Chuma 2011).

In order to address these disparities, some market solutions has been recommended which forms the backbone of the health sectors reforms being implemented in the country(Margret 2001). These reforms are privy to the fact that governments cannot allocate funds based on ability to benefits only due to scarcity of resources and political resistance. Therefore a framework based on relative need should not make ones situation worse in pursuit of the principle. The health system should enforce a fairer distribution of resources (Nyanjom 2008).

Inequality can be identified if the agreed catchment population is used in the analysis of resource allocation(Mills 1990) to determine whether the unequal's are treated unequally(Diderichsen 2004)(where deprived groups should receive preferential allocation of health care resources to achieve more rapid improvements in their health). In developing countries these efforts are watered down by elitism, lack of consensus and failure by people in authority to go for structured implementation. There has been very little attention to targeting resources directly to the less fortunate instead of making government resources equally accessible to everyone(Leighton 1995).

Governments have an obligation to ensure that the resources are distributed optimally and equitably. As a result they have the discretion and obligation to correct any anomaly in distribution of resources. Increasing health budget alone have not been shown to be accompanied by any transformation in spending which can only take place

vertically(Nyanjom 2008). Achieving greater equity generally requires real changes in resource allocation to favor disadvantaged groups, who by definition are less influential(Braveman 1997). To arrive at such a framework would need the relative inequity to be documented and resources allocation to be tracked(UN 2012).

Current research literature has not looked into how the government is making health investments (allocating hospital financial resources) vis a vis current policy action (legal framework) meant to promote equity. There is need for good data to support country's effort at streamlining poverty reducing policies including guiding ministries at developing a framework to allocate resources. In particular information touching on 'dynamic nature (trends over time)' within a country context. Using average effects to monitor and guide policy implementation can even result in health inequalities despite good intentions. Rigorous scientific measurement and evaluation of the effects of policy on equity is necessary(Vivian 2012).

2.2 Theoretical and Conceptual Framework

2.2.1 Theoretical Framework

Equity should be incorporated in resource allocation. Equity is part and parcel of the principle of social justice. Aristotle (384-322BC) stated that "justice was a principle that ensured social order by regulating the distribution of benefits". He further said that equality applied only to individuals who occupied the same stratum of the hierarchical order. By so doing his position did not challenge the social structures of society, but worked with them with the assumption that distribution should be based on what individuals deserved (Reisch 2002).

Utilitarian's theory state that distribution of resources should be for the *'greatest net balance of satisfaction for society'*. That the *'happiness of the greatest number of people should be used as the ultimate goal or standard'* irrespective of whether the losers are compensated or not. As noted by Reamer *'decisions making and processes based on the logic of utilitarianism can result in the unfair treatment of vulnerable population'*(Stephen 2005) which is not consistent with vertical equity principles.

Nozick theory on the other hand looks at social justice as an entitlement. According to this theory, individuals are free to own and acquire property while the role of the government should be restricted to that of overseeing the transactions. That government should not attempt to redistribute the resources. Individuals in need or who are poor were to be left at the mercy of their neighbors' who were to assist through donations(Tom 2011).

A vertical Equity lens was applied to assess the distribution of Hospital funds in the country(Mugambi 2006). This perspective will move beyond national averages towards analysis of regions compared to target and to each other. This is based on Rawl's theory of social justice. The main principles are that, there must be equal opportunity (in resources allocated) and greater inequality (more resources) must benefit those who have the least social and economic goods (the worst off group). Based on this premise, the goal is to make the allocation enjoyed by those in most need as big as possible, this action can be justified if it's the only way for the 'worst off' to benefit from the social inequalities(low allocation). Rawl's argues that the starting point should be to find out if the current distribution of resources is against or per the expectations. The basic structure on how the resources should be distributed is contained in the legislation which develops over time although it's not always necessary to define the weights (Rawls 1999).

2.2.2 Conceptual framework

Public health systems just like other bureaucracy are inflexible and well suited to producing standard output but ill suited to adapting to new productive roles. The Hospital Management Services Fund policy establishes an organization charged with management of financial resources meant for Hospitals. This system of administration can be described as complex since it brings together many units and functions through relations between these elements.

One of the key yardsticks to measure the policy output is equity in distribution of the hospital funds. Vertical equity principles can be used to check if the current output is appropriate and if there is any positive impact since implementation.

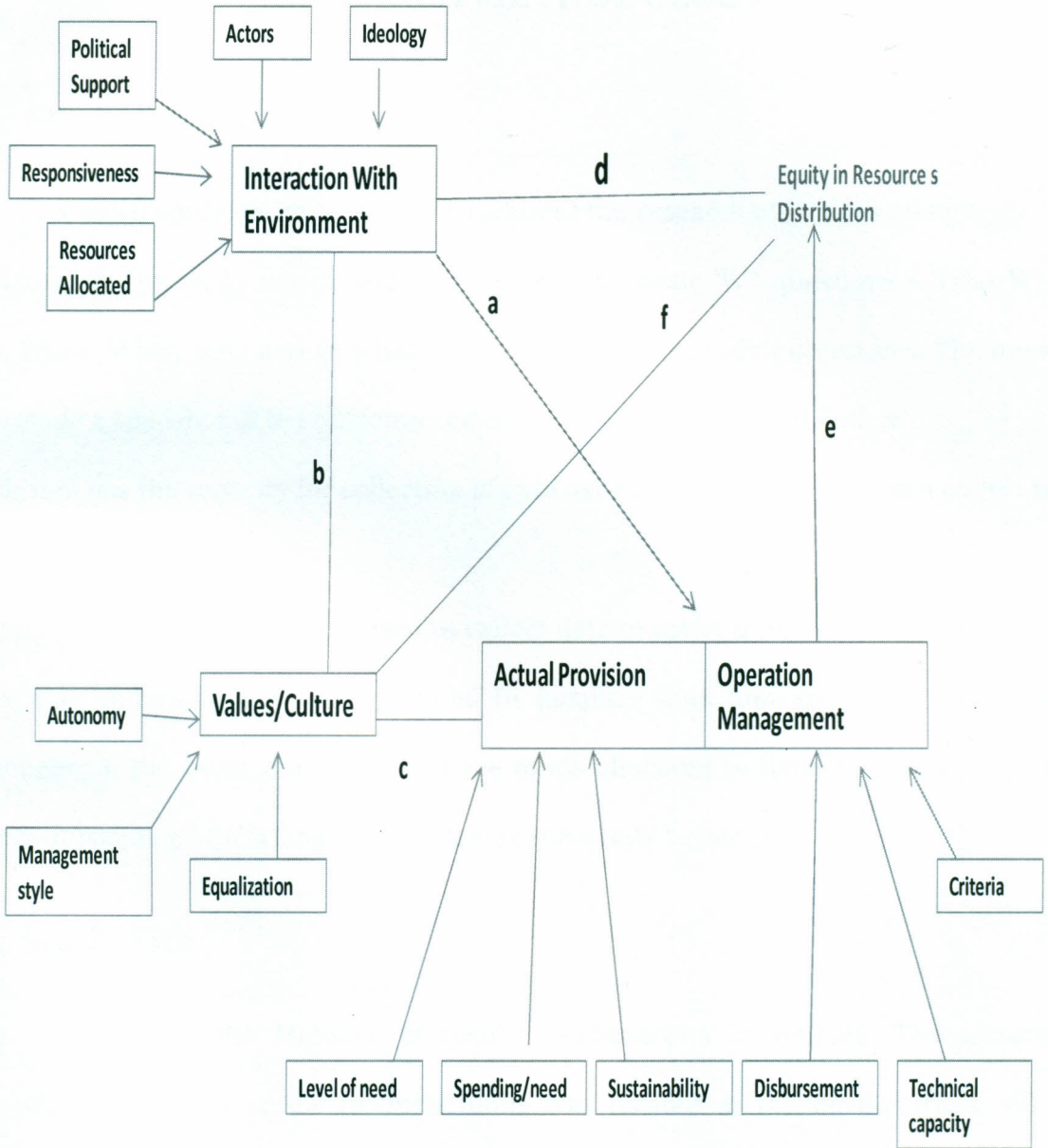
A multipolar framework will be used to describe the current performance. The multipolar framework allows for representation of the administrative unit based on its key interactions (Marchal 2012). Equity in resource allocation requires that the resource allocation criterion is implemented; that there is a common understanding of the desired allocation practice; that resources are adequate to level up or down, and the administration unit has the technical capacity to monitor; that the system have values and traditions which can allow autonomy. The external environment should also be supportive. The framework is shown below:

Linkages (A description of the arrows in the diagram):

- a- Introduction of new resource allocation criterion. Can the environment allocate adequate resources? Is the production system responsive to the environment?

- b-** Are the historical ways of allocating funds and prevailing values aligned with the changing policy context?
- c-** Is there motivation to ensure equitable distribution of resources? Is the production process aligned to the values? Can the production system offer a conducive environment for the values?
- d-** Is there congruence between resources availability and goal (equity) attainment? What is the adaptive process like? Has any resources been set aside to promote vertical equity?
- e-** Can the production process deliver the goals? Is the resource allocation formula adequate? Is the technical capacity available?
- f-** Are goals congruent with the values? Has the strategic choice influenced the values?

Figure 2.1; Conceptual Framework:



Chapter Three

RESEARCH METHODOLOGY

3.1 Study Design

A cross sectional study design was used to address the research objectives adequately. This was a descriptive study which aimed to answer the basic 'W' questions – Who Where, What, When, What, Why and so what? as contained in the study's objectives. The answers can provide a snapshot of the outcome and characteristics associated with it.

This design has the capacity for collection of data over a certain period and can collect large volume of data rapidly.

The qualitative study design was used to collect data to assist describe the current state of affairs and understanding as it pertains to hospital fund allocation. The quantitative component on the other hand analyzed the funds allocated to determine if it's fair. This combination allowed for triangulation, making the whole better.

3.2 Study Site

The study site was the Ministry of Health headquarters in Nairobi. The secretariat responsible for managing the hospital funds was located at the headquarters. All the technical heads who participate in the decision making were also at the headquarters. The allocation to Hospitals was aggregated at the County level to arrive at the County hospital allocation rate. Private hospitals were not included in the study since they don't benefit from the funds.

3.3 Target Population

The total number of counties in the country is 47. The total number of potential respondents is 102. All the technical heads and staff who work directly or indirectly with the secretariat responsible for allocation of the resources to hospitals were targeted. This includes the secretariat committee team members, planning teams, administration team and health care financing team members.

3.4 Sample Size

For the quantitative component, a complete census of all the 47 counties was done.

For the qualitative study, the sample was made up of key informants who deal with allocation of financial resources to hospitals. The key informants were selected to shed light on the current construction of the allocation practice. The target was to recruit 30 participants.

3.5 Sampling Technique

The aim of the research was to recruit about 30% of the population (102) into the study. This was seen as a representative sample which can provide adequate data(Kombo 2011). Using a convenience sampling technique we targeted the following participants;

| Participant | No | Department |
|-------------------------------------|----|-----------------------------|
| Head of the Funds | 2 | HMSF |
| Economist | 4 | Planning Department |
| Head healthcare financing | 3 | Healthcare financing&Policy |
| Financing Officers | 2 | Finance |
| Director of Administration | 1 | Administration |
| Director of Medical Services | 1 | Technical |
| Chief Health Administrative Officer | 2 | Provincial Management |
| Head Clinical Departments | 6 | Hospital Management |
| Secretariat Accountants | 6 | HMSF |
| Accounts Controller | 1 | Administration |
| Head Technical Planning | 2 | Technical Dept |

3.6 Research Instruments

The relevant data was obtained from government records at the Ministry Headquarters and also from the bureau of Statistics. The following instruments were used in the exercise;

- 1) Data collection forms; The appropriate data collection forms (see appendix 1) were developed and then transcribed into an electronic form using Redcap software. These forms were used for documentary review so as to collect information on previous money allocation to facilities in the country for financial year 2008/09,

2009/10, 2010/11, 2011/12, 2012/13. Data on poverty indices', deprivation index, number of school going children, literacy levels, and estimated number of elderly and children population and county share of the population component were also collected. The resources allocated to HMSF were also recorded. Inputs such as human resources, infrastructure allocated to the department were also noted.

- 2) Interview guide; Semi-structured Interviews with key informants who were identified in collaboration with the director of medical Services office were used for this exercise. A key informant is defined as a government officer who is directly or indirectly involved in the resource allocation process meant for public hospitals in Kenya. The identified key informants (see the table 3.1 above) were interviewed to obtain data on their current perception about the allocation practice. Semi structured interviews has the advantage of providing a focussed two way communication. The interview schedule that has been prepared for this study is an adaptation of the multipolar model (see figure 2.1). For more details about the interview schedule, see appendix 2.

3.7 Data Collection Procedures

The office of the Director for Medical Services was contacted to provide permission to collect data from the HMSF secretariat. Upon receipt of the permission letter a formal request was made to the secretariat to provide access to the financial records pertaining to allocation of funds to hospitals over the last 5 years. With the help of an assistant we carried out the documentary review and entered the appropriate data into the computer.

To reduce errors:

- A computer/electronic interface was used to enter data directly into the computer.
- The financial records were checked manually for missing entries and consultation done to try and get the missing data
- Data entry checks for range and transcription errors (characters) were developed using the program (Redcapp) that was used to provide an electronic interface.

The key informants were interviewed to provide essential information on allocation. The affected departments were alerted and appointment made at their convenience. A consent form was administered before the interview was done. The interviewer took his own notes. These notes were stored in an anonymous form.

3.8 Data Analysis Procedures

Data obtained from documentary review was analysed using Stata and Microsoft excel. The county was the unit of analysis. Quantitative data was analysed in terms of proportions and means.

Objective1; Characteristics of the counties and basis for allocation

Mean per capita allocation was calculated for county levels by dividing total allocation by the county population. The entire county population based on 2009 population census was used to calculate the per capita.

The county percentage share of hospital funds (2013) was calculated by dividing a county allocation by the total available funds. The county percentage share of devolved funds was

also calculated by dividing the funds the county received in 2013 by the total value of devolved funds.

The percentage change in annual allocations to a county over the study period (4 years) was calculated by dividing the absolute difference in funds allocation between 2010 and 2013 financial year and then multiplying that by 100.

The county development index as prepared by the commission on revenue allocation (CRA) was used to rank the counties based on their level of deprivation and to create two categories based on this score (the poor (19) and the rich (28) counties). We also developed a model using excel based on the suggested formulae and used it to allocate the funds to counties- weighted allocation (as per the policy). We then calculated the weighted percapita allocation based on the allocations and compared it with actual figures that were allocated.

Objective 2; determine if allocation is fair

The Commission on Revenue Allocation (CRA) has the constitutional mandate to formulate the ideology and criteria on the vertical sharing of government revenue. We did a comparison of the county share of hospital funds and devolved funds to determine whether the allocation of hospital funds was done equitably as per the set ideology for vertical allocation of funds. A T-test was used to test the difference in percentage change in allocation over the period for the two categories (the poor (19) and the rich (28) counties). An alpha value of <0.05 was used to test the hypothesis that there is no difference between the share of hospital fund allocated to a county and the share of devolved funds received by the county. A p-value of less than 0.05 means that poor counties receive a lesser share of hospital funds than what they merit while less poor counties get more funds than their fair

claim.

Data on need factors collected through documentary review was exported to STATA 12.0 for analysis. The key outcome measure was the percentage change in hospital funds allocation between 2010 and 2013.

Initial analysis took the form of univariate regression to determine the strength of association between the need factors and the outcome of interest. The p value and coefficient was recorded and represented using a table. An explanatory variable was said to be significantly related to the outcome if the p-value was <0.05 .

We used a less restrictive alpha level of 0.2 in the univariate analysis to identify a range of explanatory variables that might be associated with the response variable. These were then included in the final model. We used the hierarchical regression to identify the number of explanatory variables to include in the final multiple regression model. The results, adjusted p-value and coefficient, were reported in a table.

Objective3; Perception concerning the allocation practice

Data collected through interviews was analysed using qualitative methods. The interviewer took notes which were later transcribed into a soft copy using word processing software and then imported into the processing software(QSR international, Australia).Each interview transcript was assigned an unique identifier to ensure confidentiality and anonymity. The Software was used to assist carry out a thematic analysis. The analysis involved going through the essay themes which were then coded and categorised based on the emerging dominant themes.

3.9 Ethical Considerations

Before the study started, ethical approval was sort from the Kenyatta University Ethical Committee and the ministry's administration was also informed.

Data collected was treated with utmost confidentiality to guard against any adverse consequences on the participants. Permission was also sought from the Ministry's management. The records were stored in password protected computer and only the study staff had access to it. These data was only used for the purpose highlighted in this proposal.

Chapter Four

DATA ANALYSIS AND INTERPRETATION

4.1 Response rates

Quantitative component

The study aimed to collect socio-economic status data for all the 47 counties in the country as well as data on financial resources allocation to hospitals over a 5 year period.

The study recorded a 100% success rate at collecting data on the 13 socioeconomic variables we were interested in. However, data on financial resources allocation to hospitals over time were only available for a period of 4 years (out of the targeted 5 year period).

Qualitative component

The sample for the study consisted of 22 healthcare workers at the national ministry's headquarters. This represents a 73.3% response rates. The top managers were not available due to their engagement. This being an exploratory method, the response rate can be considered to be adequate to answer the study objective(Judith 2011; Kombo 2011).

4.2 Counties characteristics & basis for allocation

The counties are ranked from the poorest to the richest based on the County Development Index(CDI) which was produced by the commission on Revenue allocation(CRA).Based on this quantitative measure, the first 19 counties are deemed to be poor while the remaining ones are less poor. The per capita hospital fund allocation, the county share of the hospital

funds as well as the devolved funds is shown in Table 4.1 below. The percentage increase in the funds allocated to a county over the last 4 years (2010 to 2013) is also shown in Table 4.1 below.

Table 4.1; County share of hospital funds and devolved funds

| County | Per Capita Hospital (KSH) | Share of the Hospital Allocation (%) | Share of the Devolved Funds (%) | Percentage Increase (%) |
|------------|---------------------------|--------------------------------------|---------------------------------|-------------------------|
| Turkana | 15.27 | 1.57 | 3.76 | 60.85 |
| Mandera | 12.11 | 1.50 | 3.19 | 60.94 |
| Wajir | 23.40 | 1.87 | 2.67 | 138.14 |
| Marsabit | 25.75 | 0.90 | 1.93 | 32.33 |
| West Pokot | 13.27 | 0.82 | 1.71 | 28.50 |
| Samburu | 17.56 | 0.47 | 1.33 | 30.99 |
| Tana river | 45.46 | 1.32 | 1.48 | 12.48 |
| Baringo | 16.70 | 1.12 | 1.73 | 37.12 |
| Narok | 12.04 | 1.23 | 1.97 | 50.60 |
| Kwale | 29.10 | 2.28 | 1.98 | 41.09 |
| Kitui | 20.76 | 2.53 | 2.82 | 36.31 |
| Homa Bay | 16.70 | 1.93 | 2.72 | 30.84 |
| Garissa | 47.56 | 3.57 | 2.23 | 100.52 |
| Tharaka | 30.14 | 1.33 | 1.15 | 58.19 |
| Nithi | | | | |

| | | | | |
|--------------------|-------|------|------|-------|
| Trans Nzoia | 18.69 | 1.84 | 1.87 | 9.36 |
| Kilifi | 16.94 | 2.27 | 2.77 | 33.60 |
| Bomet | 7.92 | 0.69 | 1.94 | 33.58 |
| Busia | 31.75 | 1.87 | 2.02 | 26.79 |
| Taita Taveta | 48.01 | 1.65 | 1.25 | 29.36 |
| Isiolo | 65.08 | 1.12 | 1.15 | 90.67 |
| Migori | 33.91 | 2.30 | 2.27 | 42.89 |
| Kisumu | 43.57 | 5.09 | 2.31 | 35.77 |
| Kajiado | 13.01 | 1.08 | 1.67 | 27.81 |
| Makueni | 22.78 | 2.43 | 2.25 | 35.83 |
| Machakos | 26.26 | 3.48 | 2.60 | 35.65 |
| Elgeyo Marakwet | 30.70 | 1.37 | 1.49 | 33.71 |
| Meru | 18.19 | 2.97 | 2.62 | 30.68 |
| Siaya | 14.68 | 1.49 | 1.89 | -7.37 |
| Nandi | 18.28 | 1.66 | 1.85 | 30.60 |
| Bungoma | 12.84 | 2.52 | 2.83 | 36.52 |
| Lamu | 47.88 | 0.59 | 0.76 | 29.56 |
| Muranga | 14.97 | 1.70 | 2.06 | 32.48 |
| Laikipia | 15.48 | 0.74 | 1.31 | 30.90 |
| Kakamega | 22.97 | 4.60 | 3.50 | 28.25 |
| Embu | 46.26 | 2.88 | 1.60 | 31.80 |
| Vihiga | 13.71 | 0.92 | 1.44 | 98.36 |

| | | | | |
|-------------|-------|------|------|--------|
| Kericho | 27.88 | 2.55 | 1.54 | 30.72 |
| Nyandarua | 20.97 | 1.51 | 1.63 | 32.09 |
| Nakuru | 33.20 | 6.41 | 3.29 | 28.32 |
| Kirinyaga | 18.93 | 1.20 | 1.34 | 31.22 |
| Kisii | 19.35 | 3.52 | 2.77 | 42.57 |
| Nyamira | 25.84 | 1.86 | 1.58 | 161.37 |
| Uasin Gishu | 8.38 | 0.90 | 1.93 | 61.00 |
| Nyeri | 42.86 | 3.58 | 1.94 | 36.27 |
| Mombasa | 33.37 | 3.78 | 2.14 | 47.60 |
| Kiambu | 20.32 | 3.97 | 2.98 | 30.69 |
| Nairobi | 7.96 | 3.01 | 4.71 | 63.86 |

The summary statistics for the four indicators are shown in Table 4.2 below. The median per capita allocation rate was KSH 20.76 while the inter-quantile range was KSH 15.26 to 31.75. Bomet County received the lowest per capita allocation mainly due to a low number of hospitals in the county. Isiolo had the highest per capita allocation at 65 shillings which is 3 times higher than the median per capita allocation. This high per capita allocation in this region can be explained by the low county population relative to the amount allocated. The median share of hospital funds was 1.84%. About half of the counties received between 1.20 to 2.88% of the total funds. About 25% of the counties received an allocation rate lower than 1.20%, while a further 25% of the counties received an allocation higher than 2.88% of the total allocation. Lamu County got the least share (0.76%) of the total funds mainly due to its small size and few numbers of hospitals. Nakuru County got the highest

share (6.4%) of the hospital funds. The presence of the busy and largest (Nakuru) provincial hospital in the county could have led to the high allocation.

Based on share of the devolved funds, about half of the counties received between 1.58% to 2.67% of the funds with a median of 1.94%. The median share of devolved funds (1.94%) was higher than the share of hospital funds (1.84%) indicating that most counties attained a higher share of devolved funds (an equitable allocation of funds). The range in the share of devolved funds was also tighter (3.94%) compared to that for the share of hospital funds (5.93%). Over the 4 years study period, the hospital allocation to counties increased by at least 33.6% indicating a growth in the amount allocated to hospitals. Most of the hospital attained an increase of about 30.67% to 47.6% which was relatively higher than the overall growth in hospital fund budget. From the data we have the growth in the total hospital funds budget was mainly driven by the increase in the number of hospitals (19 new hospitals) and the upgrading of sub-district hospitals into district hospitals. . Surprisingly, funds allocated to Siaya County went down while Nyamira County attained almost a two fold increase in the allocated funds (161%).

Table 4.2; Summary of the county funds allocation characteristics

| Parameter | Median | Inter-quintile Range | Smallest | Largest |
|----------------------------------|----------|----------------------|------------------|-------------------|
| Per capita | KSH20.76 | KSH15.26 to 31.75 | KSH7.9(Bomet) | KSH65(Isiolo) |
| Share of Hospital Fund Allocated | 1.84% | 1.20 to 2.88% | 0.47% (Samburu) | 6.4% (Nakuru) |
| Share of devolved funds | 1.94% | 1.58 to 2.67% | 0.76% (Lamu) | 4.71 (Nairobi) |
| Percentage increase | 33.60% | 30.67 to 47.6% | -7.37% (Siaya) | 161.37 (Nyamira) |

| | | | | |
|---|--|--|--|--|
| in hospital allocation between 2010 2013 | | | | |
|---|--|--|--|--|

According to the Health Management Services Fund documents, the current allocation criterion is as shown Table 4.3 below.

Table 4.3; Weighted allocation criteria

| | | |
|---|--------------------|------|
| District hospitals and sub-district hospitals(HMSF) | Poverty levels | 0.2 |
| | Bed utilization | 0.4 |
| | Outpatient cases | 0.2 |
| | Accident proneness | 0.05 |
| | Price of fuel | 0.15 |

Most of the funds are to be allocated based on the hospital size and inpatient work load. The poverty level and outpatient workloads were given the same weights (0.2). It's worth noting that both the inpatient and outpatient work loads are weak at estimating the relative health need in a population(Sheena 2004).

Table 4.4 shows the comparison between the percapita based on current allocation and one based on what was calculated using the model (weighted one). Initial inspection indicates that the percapita allocation based on the criteria is different from the percapita based on what was sent to the counties in FY 2012/13. The median of the calculated allocation

(weighted) was KSH 23.4 which is higher than the median based on what was sent to the counties KSH 20.7. This indicates that based on the policy (weighted) most hospitals would stand to benefit from a higher allocation. The inter-quantile range was also different at KSH 20.2 to 29.1 while one based on what was sent to the counties was KSH 15.2 to 31.75. This indicates that the actual money sent to the counties was not based on the agreed criteria alone. That other considerations were likely at play or may be the criteria is partially implemented. Other studies in Africa have also recorded this disparity between the actual allocation sent to units and what should have been allocated had the allocation criteria been implemented in full (Augustine 2006; Asante 2009; EQUINET 2012).

Table 4.4 : Comparison of current allocations with the calculated figure based on the formula

| County | Hospital Allocations | Hospital Allocation Based on Criteria |
|------------|----------------------|---------------------------------------|
| Turkana | 15.3 | 17.1 |
| Mandera | 12.1 | 15.7 |
| Wajir | 23.4 | 19.1 |
| Marsabit | 25.7 | 27.8 |
| West Pokot | 13.3 | 32.5 |
| Samburu | 17.6 | 23.8 |
| Tana river | 45.5 | 28.8 |
| Baringo | 16.7 | 23.9 |
| Narok | 12.0 | 20.3 |

| | | |
|--------------------|------|------|
| Kwale | 29.1 | 21.7 |
| Kitui | 20.8 | 17.9 |
| Homa Bay | 16.7 | 21.2 |
| Garissa | 47.6 | 23.4 |
| Tharaka Nithi | 30.1 | 30.0 |
| Trans Nzoia | 18.7 | 20.8 |
| Kilifi | 16.9 | 23.1 |
| Bomet | 7.9 | 14.2 |
| Busia | 31.7 | 44.0 |
| Taita Taveta | 48.0 | 39.4 |
| Isiolo | 65.1 | 51.9 |
| Migori | 33.9 | 33.0 |
| Kisumu | 43.6 | 9.6 |
| Kajiado | 13.0 | 33.4 |
| Makueni | 22.8 | 28.9 |
| Machakos | 26.3 | 23.8 |
| Elgeyo Marakwet | 30.7 | 21.0 |
| Meru | 18.2 | 21.3 |
| Siaya | 14.7 | 17.1 |
| Nandi | 18.3 | 21.6 |
| Bungoma | 12.8 | 20.4 |

| | | |
|-------------|------|------|
| Lamu | 47.9 | 62.7 |
| Muranga | 15.0 | 33.8 |
| Laikipia | 15.5 | 21.5 |
| Kakamega | 23.0 | 30.9 |
| Embu | 46.3 | 29.1 |
| Vihiga | 13.7 | 14.0 |
| Kericho | 27.9 | 18.5 |
| Nyandarua | 21.0 | 24.0 |
| Nakuru | 33.2 | 26.8 |
| Kirinyaga | 18.9 | 25.8 |
| Kisii | 19.4 | 22.8 |
| Nyamira | 25.8 | 21.8 |
| Uasin Gishu | 8.4 | 11.4 |
| Nyeri | 42.9 | 32.8 |
| Mombasa | 33.4 | 25.3 |
| Kiambu | 20.3 | 23.9 |
| Nairobi | 8.0 | 8.1 |

4.3 Determine whether allocation is fair

Does the current hospital fund allocation practice lead to equitable distribution?

The T test results for the hypothesis that there is no difference between the proportion of allocated hospital funds and proportion of devolved funds between the rich and poor counties are presented in Table 4.5 below.

Table 4.5; T test results

| Group | Obs | Mean | Std. Err. | Std. Dev. | [95% Conf. Interval] | |
|------------|-----|-----------|-----------|-----------|----------------------|----------|
| Least Poor | 28 | .3492024 | .2033189 | 1.075863 | -.0679736 | .7663784 |
| Poor | 19 | -.5146141 | .182815 | .796872 | -.8986941 | -.130534 |
| combined | 47 | -1.27e-09 | .1537809 | 1.054269 | -.3095448 | .3095448 |
| diff | | .8638164 | .289474 | | .2807859 | 1.446847 |

diff = mean(0) - mean(1) t = 2.9841

Ho: diff = 0 degrees of freedom = 45

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0

Pr(T < t) = 0.9977 Pr(|T| > |t|) = 0.0046 Pr(T > t) = 0.0023

From Table 4.5 above the Least Poor counties are getting 0.35% more share of hospital funds than their share of devolved funds allocated by the Ministry of Finance. While the Poor counties are getting 0.5% less share of hospital funds than the devolved funds allocated to them by the Ministry of Finance. This means that the poor counties are

receiving a lesser share than their claim. The T-value is 2.98 with a p-value of 0.004. This indicates that the allocation of hospital funds tends to benefit the well off counties and the allocation practice is significantly different from what has been recommended by Commission on Revenue allocation. As noted above (Table 4.4), a possible explanation of this difference could be due to the failure of the ministry of health to implement the allocation criteria in full.

Is the current allocation practice based on need factors?

Table 4.6 below shows the results of the regression analysis. These results can be summarized as follows;

Surface area

A county's surface area was not significantly associated with the change in the funds allocated. This indicates that the increase in the funds allocation did not take the size of the county into consideration.

Poverty

There is no significant relationship between poverty and percentage change in allocation. This suggests that although poverty was one of the criteria in the formula it didn't have an impact in the way funds were allocated.

Fuel price

The percentage increase in allocated funds seems to be sensitive to the price of fuel in different counties. This value was weakly significant at 0.07.

Population

The association was non-significant with a p-value of 0.785. The change in funds allocation was not due to differences in population level.

Under-five population and Female

There was no association between the change in allocation and the under five and female population. This suggests that these indicators were not taken into consideration in review of allocation.

Number of health facilities

The association between the percentage change in allocated funds and the number of facilities was weak. The funds allocation varied depending on the number of facilities in a county.

Vaccination level and skilled delivery

There was no relationship between these health measures and the variation in amount allocated to the counties.

Nurses density

The association between the nurse density and percentage change in allocation was non-significant. The additional funds were not allocated to counties based on their nurse density.

HIV

The association between HIV burden and percentage change in funds allocated was non-significant indicating that a county's HIV burden was not considered.

Inpatient and outpatient

The association between inpatient work load and percentage change was significant with a p-value of 0.0316. A similar association was also recorded between outpatient work load and percentage change in allocation at a p-value of 0.0431.

Table 4.6; Regression of percentage change in allocation on explanatory factors

| VARIABLE | CRUDE COEFFICIENT (95%CI) | P VALUE | ADJUSTED COEFF (95%CI)(| P-VALUE |
|--|---------------------------------|--------------|----------------------------|---------|
| <i>Geographical features</i> | | | | |
| % county share of the total surface area | -2.64(-1.23 7.26) | 0.248 | | |
| <i>Economic Characteristics</i> | | | | |
| Fuel Price | 137.722(21.32 335.14) | 0.077 | | |
| Poverty rate | 0.30(-0.04 0.92) | 0.195 | | |
| <i>Population characteristics</i> | | | | |
| % share of the total population | -0.79(-7.56 3.00) | 0.785 | | |
| % share of Female in the | -0.176(-5.42 -0.28) | 0.920 | | |

| | | | | |
|---|----------------------|--------------|---------------------|--------------|
| county | | | | |
| % share of U5 in the county | -0.3816(-4.03 3.40) | 0.834 | | |
| <i>Health Indicators</i> | | | | |
| HIV rate (county) | -1.46(-4.03 0.44) | 0.187 | -2.00(-4.97 0.08) | 0.099 |
| % county share of total health facilities | -5.65(-12.80 -0.54) | 0.07 | -7.05(-14.00 -1.57) | 0.032 |
| % county share of inpatient in the country | --4.62(-9.62 -1.11) | 0.031 | | |
| % of Skilled Delivery | -0.15(-0.64 0.03) | 0.546 | | |
| % of Immunization coverage | -0.59(-1.39 -0.04) | 0.106 | -0.84(-1.78 -0.18) | 0.049 |
| Nurses density per 1000 | -21.44(-74.89 28.03) | 0.437 | | |
| % county share of OPD visits in the country | -4.26(-9.10 -0.55) | 0.043 | | |

Six variables whose p-value was less than 0.2 were chosen for inclusion into the final model. The hierarchical regression analysis indicated that inpatient, outpatient workloads and share of health facility were strongly correlated. The share of health facility was picked

to represent the other two since it showed the strongest relationship. Fuel price was also dropped from the final model.

The multiple regression analysis results are also represented in Table 4.6 above. The three factors (Vaccination rate, HIV rate and Share of Health facility) are responsible for only 18.7% variation in change in allocation rate.

All the factors showed a negative association with the outcome. The relationship between vaccination rate and percentage change in allocation was significant with an adjusted p-value of 0.049, but negative in nature. For every unit increase in vaccination rates, the amount allocated to a county went down by about 1%. The increase in allocation seems to have favored regions with lower vaccination rates. This indicates that the increase in funding was responsive to the vaccination gap.

Similarly the relationship between number of health facilities and change in amount allocated was negative and significant. The adjusted p-value was 0.032. For every unit increase in number of facilities, the percentage increase in allocated funds went down by 7%. This indicates that a real effect exists between the number of facilities and the outcome. This could be explained by the fact that poor counties tend to have many small facilities while large hospitals which attract heavy funding are mainly located in large urban or productive counties.

After adjusting for the other two variables, the relationship between HIV rate and percentage change in allocation was non-significant. This indicates that a real effect does not exist between the HIV preference rate and percentage change in allocation.

Based on the above findings, there is clear evidence of a negative association of percentage change in funding to counties with size (Outpatient and Inpatient workloads) and number

of the Hospital.

4.4 Perception concerning the allocation practice

22 interviews were conducted giving a response rate of 73%. The qualitative findings are summarized under the following headings;

How funds should be distributed

Analysis revealed that 68% (15/22) of the ministry officials interviewed felt that fund should be allocated to counties based on their development status (need). The rest 7/22 were noncommittal about how hospital funds should be distributed to counties. This indicates that majority of the participants are aware of the current government ideology that vertical allocation of funds should be based on the county development status and effort should be made to correct previous historical injustices.

Population groups and social conditions that should be prioritized in allocation of funds

Participants view on the population groups that should be given priority varied widely (see figure 4.1). There was consensus (22/22) that people living with HIV/AIDs and those living in the rural areas should be prioritized in the allocation. People with disability and the elderly populations were not considered as a priority group. The low interest in the disability and elderly cohorts correlates well with our current policies which has not valued and set aside money for these programmes.

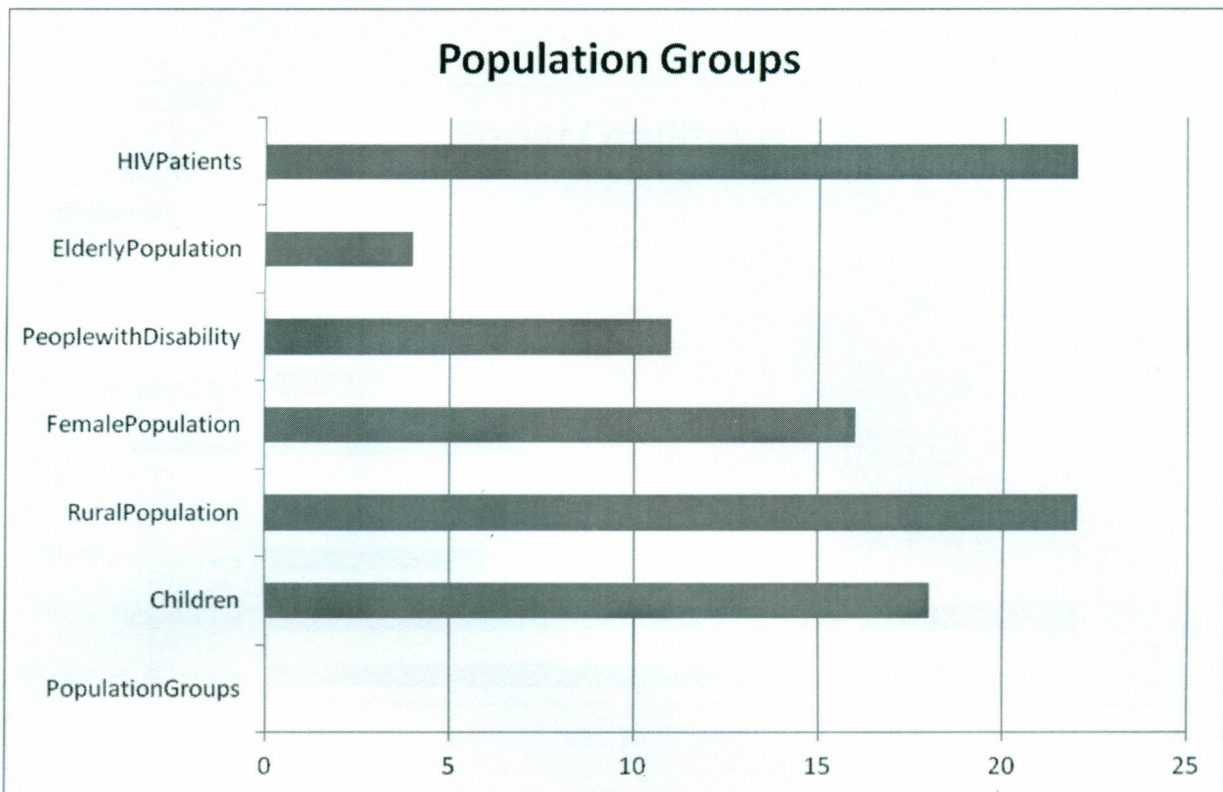


Figure 4.1; Priority population groups

According to figure 4.2 all the respondents felt that the size of the hospital and its workload should be considered in the allocation practice. Poverty levels and marginalized regions were also seen as key parameters which should be put into consideration in the allocation practice. Social determinants such as housing status, availability of sanitation and water, literacy levels and transportation barriers were not seen as a priority.

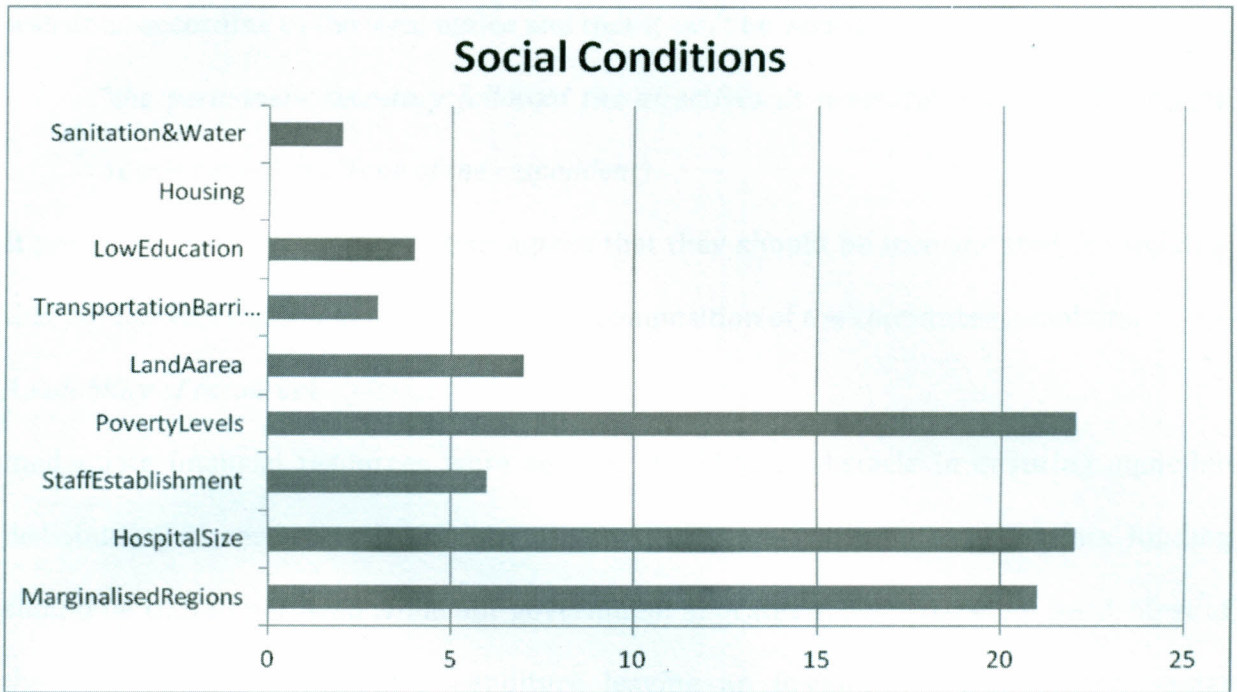


Figure 4.2; Social Conditions

It was surprising to note that when respondents were asked to mention the top priorities, financial barriers and cost of fuel dominated the list yet they were never mentioned as key social conditions.

Representation of the target groups

Participants were asked to explain how the identified population groups are represented in the decision making process. What came out was that proper mechanisms have not been put in place to incorporate the identified priority groups in the decision making. An amendment would be required to include a representative from the groups. A good number

of officers working with the secretariat emphasized that the composition of the committee was done according to the legal notice and that it can't be varied.

“the permanent secretary followed the directives as provided in the legal notice to appoint members.”(one of the respondent)

It appears that although the system agrees that they should be incorporated, it's unlikely that anyone will make a move to amend the composition of the committee members.

Availability of resources

Inadequate financial resources were seen as the biggest obstacle in ensuring equitable distribution of resources. According to the WHO, public healthcare percapita funding should be USD40 per head while our government allocates about USD24 per head. Most of the funds go for recurrent expenditure leaving an insignificant amount for capital expenditure such as expansion or construction of new hospitals. Most of the respondents noted that the numbers of hospitals have almost doubled over the last 5 years but the funds meant for hospitals have not doubled.

*“the problem is that we do not have enough money. Not that it's unique to us, but it looks like treasury has neglected our sector. We have upgraded hundreds of healthcentres into hospitals but they have not sent additional funds for these facilities’
(concerned respondent)*

In relation to what is being done to target the available resources to the needy areas, most participants said that there is a criteria in use to guide allocation. It seems that they felt confident that the criterion was adequate at addressing inequalities. Some respondents felt that it's now up to the county government to come up with local solutions since all the monies are now being channeled to them.

Chapter Five

Summary, Conclusion and Recommendations

5.1 Discussions

Objective 1

Based on the findings, it appears allocation of finances to hospital is done in a systemic manner. Majority of the counties had an increase in funding over the four year period of between 30 to 50%. This pattern of distribution can be interpreted as a result of policies made over the year (Paul 2004). A resource allocation formula has been proposed. It's not clear the extent to which the formula has been implemented. However, it was noted that the secretariat does not have a cost accounting system which is crucial at estimating the costs of hospital services in different counties. Cost accounting forms the basis of most formulae in developed countries. The allocation results obtained based on the model (using the suggested criteria) differed from the actual amount that was allocated indicating that the allocation formula was partially implemented. This conforms with other studies in Africa which has shown that despite the availability of a formula to guide allocation the actual allocation differs significantly from the equity target (Augustine 2006; McIntyre 2012) This tends to suggest that the implementation of the allocation criteria is partial.

The current formula contains 5 parameters. Population has not been included in the formula suggesting that the formula does not take the population into account. In National Health service, population is one of the key criteria (DH 2011) and so is the case with most of the countries (Mozambique, Namibia, Tanzania, Zambia, Zimbabwe) that has adopted a

resource allocation formula(Mcintyre 2012). Since the hospital services are meant for the people, the population should be one of the main determinants for resource allocation as noted in the resource allocation formula designed by CRA(CRA 2012).

Poverty level was used to measure the relative economic status of the region and was weighted at 0.2(2%). Regions with high poverty levels have low per capita income and by extension low purchasing power. This parameter is appropriate considering that studies have shown that there is a strong relationship between health and economic status(Erik 2011). Allocation of funds based on poverty levels can have some impact on poverty reduction since it is a form of subsidy that make healthcare affordable to the poor. This can improve the demand for services among the vulnerable population. Its weight is equivalent to the Commission on Allocation formula at 20% indicating some conformity with the general government ideology on resource allocation(CRA 2012). Most countries in east and southern Africa have not included this parameter in their formulae(EQUINET 2012).

The price of fuel was pegged at 15%. This indicator was used as a proxy measure of the living costs in different counties. Its choice might be informed by lack of comprehensive cost accounting information for hospital services across the counties.

Hospital administrative statistics such as outpatient and inpatient morbidity formed the backbone of the formula. Inpatient services were weighted at 40% while outpatient workload was weighted at 20% giving a sum of 60%. These indicators are not in use in any county in east and southern Africa. Previous use of these indicators in United Kingdom showed that such models tend to shift resources from the deprived regions to rich regions and should thus be avoided(Sheena 2004).

Other indicators present in the national formula which were missing in the hospital formula include land area, equitable share and a separate fund for the deprived regions.

Objective 2

Our results showed that poor counties receive less hospital funds than their fair claim based on equity targets. Furthermore, the increase in hospital funding over the years tend to favor counties with big hospitals and never takes into consideration a number of relative health need factors.

After comparing the share of devolved funds allocated to counties based on the national formula with the share of hospital funds. It was noted that poor counties receive 0.5% less hospital funds than the equity target while rich counties receive more (0.35%) share of hospital funds than its fair share. Based on these results poor counties are unlikely to attain their fair share if the current allocation practice persists. While the country has made some efforts to depart from the historical incremental approaches in resource allocation, the present allocation practice still falls short of the expectations (as created by the CRA). These findings coincide with other studies' findings in sub-Saharan Africa(Augustine 2006; McIntyre 2012)

Assessment of the relationship between increase in funding and a variety of need factors indicate that the change in level of funding over the 4 years was highly sensitive to inpatient and outpatient workloads. Counties with bigger hospitals attained a higher increase in allocation than counties with smaller hospitals and by extension a low work load. These factors form the bulk of the formula. Big hospitals tend to be located in large urban areas. As noted by a study in UK, allocation of resources based on hospital size and

workload results in biased distribution of resources that favors the rich counties (Sheena 2004). It can thus be argued that an increase of funding based on these two measures is contrary to government policy imperative of improving a network of government facilities that can provide equitable health services with easy reach of all Kenyans (GOK 2012). The increase in allocation was also weakly associated to number of facilities and fuel price. A KIPPRA study noted that distribution of infrastructure tends to be unevenly distributed which probably could explain the low association of increase in funding and number of facilities. This could be due to the poor correlation between the increase in number of facilities and growth in recurrent funding to hospitals (Paul 2004).

The increase in allocation had no relationship with the population which can be partly explained by the fact that population was missed in the allocation criteria/formula.

The association between the female population and increase in funding indicated that this cohort was ignored during the allocation practice. Since women health has some impact on overall demand for resources WHO has recommended that policies should be reoriented and appropriate legal framework put in place to ensure resource allocation is sensitive to women needs (WHO 2012).

Optimal performance of the healthcare delivery system requires a fair mix of financial and human resources. Human capital can influence the quantity of healthcare goods and services. Our study indicated that there was a poor relationship between the nursing density and increase in funding.

The results from the multiple regression model indicate that the increase in funding benefitted regions with low immunization rate. From this perspective the increase in

funding can be said to be equitable resulting in improved coverage for these services. This also underscores the impact of providing immunization services at the hospital level.

A surprising finding was that there was an inverse relationship between the number of facilities and change in funding levels. This could partly be explained by the fact that old and big hospitals attracted a higher rate of funding while the small hospitals had a lower rate in growth in funding.

Objective 3

The findings of this study indicate that there was varied perception about how funds should be allocated despite the availability of an allocation criterion.

HIV cohort was cited as an important group that should be considered in the allocation.

This ties well the fact that poor households tend to suffer the most in terms of burden caused by HIV/AIDS (Paul 2004). People suffering from HIV/AIDs represent a group with additional health needs. Additional funds should thus be availed for these services. This need factor was however, absent in the original allocation criteria and its strong support in this study indicate that it should be included. Since HIV/AIDS tend to weaken the society fabric, counties with higher HIV burden should be allocated more money. The respondents also felt that people living in the rural areas face a number of barriers in access of health services. There was a strong feeling that health need vary according to rurality and should thus be considered in the allocation. This parameter was also missing in the original allocation criterion.

In developed countries the elderly population is taken into account in the allocation practice. They tend to suffer from chronic illnesses and thus carry a higher health burden.

quantitative results that showed that the money that was allocated to counties was different from what was calculated using the allocation formulae.

Before making recommendations, it's worth noting that this study has some weaknesses. First is that we never incorporated majority of the resources allocated to hospitals such as the cost of medical supplies and personnel costs. Second, the study sought the opinion of staff working at the macro level which is likely to differ from staff working at the meso level (counties) and at the hospital level. Lastly, some of the socioeconomic data may be out of date and may not represent the current prevailing socioeconomic conditions.

5.2 Conclusion

1. The Ministry of Health allocation criteria is partially implemented.
2. Allocation of hospital funds is inequitable. Based on the current allocation practice, allocations of hospital funds tend to benefit those counties that are well off. The share of hospital funds sent to counties differs from the share of devolved funds sent to counties with the well off counties getting a significantly higher allocation of hospital funds.
3. There is clear evidence of a negative association of percentage change in funding to counties with size (Outpatient and Inpatient workloads) and number of the Hospital.
4. Major socio-economic determinants such as housing, availability of water and sanitation, literacy levels and transportation barriers are not considered as

important factor for consideration in resource allocation. Key population groups such as the elderly and HIV cohort were also ignored in the allocation process.

5. The target groups are not well represented in the health resources allocation decision making.

5.3 Recommendations

Policy recommendations

Based on our findings and results we make the following recommendations;

1. The resource allocation formula should be revised so as to ensure that historical inequities are addressed. The weights attached to utilization data (inpatient and outpatient workloads) should be adjusted since utilization data cannot reliably be used to estimate the needs gap. In the meantime the current allocation criteria should be implemented.
2. The ministry should also improve the health information system so as to improve the quality of data on all social determinants of health.
3. Improve the technical capacity at the headquarters to enable it to adequately address equity in resources allocation and also implement the formula. This should be accompanied by establishment of cost accounting systems to support costing of services in all counties.
4. Improve funding to Hospitals and set up equalization funds so as to accelerate health development in Kenya.
5. Create a broad based process that can encourage citizens' participation in resource allocation.

Recommendations for further Research

We applied both quantitative and qualitative methods in our research. The quantitative methods were helpful in providing answer to whether distribution of hospital funds was equitable or not and how it differed against a variety of need factors. The qualitative aspect was helpful in giving as a preview of what practitioners considered as important considerations as well as their attitude towards the legal framework. While it might be tricky to capture all the aspects of an allocation practice in a single study we have demonstrated how the hospital financing varied over time vis a vis a set of need factors. We have also shown the extent to which current allocation differs from the equity targets. We also captured the practitioners/managers perception about equitable allocation practice. Several gaps remain;

1. An equity analysis incorporating other resources should be carried out so as to generate comprehensive information about the actual state in our sector.
2. To allow revision of the formula, there is need to collect information and arrive at a reasonable mix of criteria and appropriate weights.
3. There is need to develop a model based on small area analysis to allow for equity analysis at the county level.

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APPENDICES

Appendix 1. County Profile and Hospital allocations Data collection form

County Code:..... Date:.....

a. Number of Facilities in the County

| <i>No of Facilities:</i> | Referral/ Provincial Hospitals | District Hospitals | Subdistrict Hospitals | Health Centers | Dispensaries |
|--------------------------|--------------------------------|--------------------|-----------------------|----------------|--------------|
| | | | | | |

b. Need factors

| <i>Need Factors</i> | Poverty levels | Area | No of <5 | Female Population |
|---------------------|-------------------------|---------------------|------------------|--------------------------|
| | | | | |
| <i>Need Factors</i> | No of Health Facilities | HIV/AIDS prevalence | Total Population | Access to water / Others |
| | | | | |

c. Hospital Allocations Data

| Financial year: | | | | | | Hospital Specific Data | | | | Outpatient Cases |
|---------------------|----|----|----|----|--------|------------------------|-----------------|---------------|----------------|------------------|
| Facility Name/ Code | Q1 | Q2 | Q3 | Q4 | Annual | Annual FIF | Bed Utilization | Price of fuel | Accident Prone | |
| | | | | | | | | | | |

Appendix 2. Interview Schedule

| | | |
|---------------------------------|--------------|--|
| Date of discussion: | Interviewer: | |
| Venue: | Note taker: | |
| Time start: | Time stop | |
| Interview completed | Yes | |
| | No | |
| Reason for Incomplete interview | | |
| | | |
| | | |
| | | |

Section A; Process/governance

1. What is the process for decision how much to allocate to a hospital-Is the process explicit?

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(Prompts-How is the membership and what interests do they represent:- economic(does it dominate decision making)/social/health. Who is included and who is excluded)

2. How is the hospital fund allocation committee established?

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.....
.....
.....
.....
.....
.....

(Prompt-Are the ones targeted involved.)

3. What are the prevalent or convenient assumptions that have been taken?

.....
.....
.....
.....

(Prompt-What does the institution focus on/standard set)

4. Do we have a well being ranking and public audit to identify deprived facilities or areas?

Y..... No.....

How is the well being assessment carried out at the ministry?

.....
.....
.....

.....
...

Section B The allocation practice Goal.

1. What is the goal pursued in allocation of hospital funds?

Is it 'do no harm' focus;.....

Is it 'pro poor' focus ;.....

Is it maximize equity focus;.....

Is it improve equity focus;.....

2. Is an M&E in place to monitor progress towards the attainment of the goal?

.....
.....
.....
.....

Section C Target Group/Beneficiary

1. If equity is being pursued, what is the target group?

.....
.....
.....
.....
.....

(Prompt- At which scale(s) is equity considered: individual, household, Facility, County, Province, and National?)

2. Are some of the (ultra local/county level) causes of inequity and solutions been missed-by the national formula?

.....
.....
.....
.....

Section D Contents

1. What is the distributive practice (is it a formula and what are the weights)?

.....
.....
.....
.....
.....

(Prompt-Allocation among stakeholders of risks, benefits and costs resulting from policy or resource management decisions, has it been given consideration?)

2. How is current allocation justified: Needs, Merit, Equality (equal shares) and social welfare?

.....
.....
.....
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.....
.....

3. Who is participating in decision making and who is left out?

.....
.....
.....
.....
.....
.....

(Prompt-Which marginalized groups are recognized? Voicing their interests?

Prompt-Is there representation, recognition/ inclusion, voice and participation in decision making.)

4. Do the decisions reflect the interests of the marginalized?

.....
.....
.....
.....
.....
.....

(Prompt-What local institutions provide safety nets? Prompt-What new capabilities are being developed? Prompt-Have you been able to identify the causes of inequity?)

5. Do the below mentioned factors limit or facilitate the operations at the secretariat?

a) Human resources(Technical capacity/adequacy/motivation)

.....
.....
.....
.....

b) Access to Resources (Financial, Technology and Room/space).....

.....
.....
.....

c) Power(to gain and maintain resources)

.....
.....
.....
.....
.....
.....

Appendix 3: Ranking based on County Development Index

| County | CDI | Poor Counties (CDI<0.52) |
|---------------|------|-----------------------------|
| Turkana | 0.27 | X |
| Mandera | 0.31 | X |
| Wajir | 0.33 | X |
| Marsabit | 0.37 | X |
| Samburu | 0.38 | X |
| West Pokot | 0.38 | X |
| Tana river | 0.39 | X |
| Baringo | 0.44 | X |
| Narok | 0.44 | X |
| Kwale | 0.45 | X |
| Kitui | 0.46 | X |
| Garissa | 0.47 | X |
| Homa Bay | 0.47 | X |
| Tharaka Nithi | 0.48 | X |
| Trans Nzoia | 0.49 | X |
| Kilifi | 0.5 | X |
| Bomet | 0.51 | X |
| Busia | 0.51 | X |
| Taita Taveta | 0.51 | X |

| | | |
|-----------------|------|--|
| Isiolo | 0.52 | |
| Migori | 0.52 | |
| Kajiado | 0.53 | |
| Kisumu | 0.53 | |
| Elgeyo Marakwet | 0.54 | |
| Machakos | 0.54 | |
| Makueni | 0.54 | |
| Bungoma | 0.55 | |
| Meru | 0.55 | |
| Nandi | 0.55 | |
| Siaya | 0.55 | |
| Lamu | 0.56 | |
| Embu | 0.57 | |
| Kakamega | 0.57 | |
| Kericho | 0.57 | |
| Laikipia | 0.57 | |
| Muranga | 0.57 | |
| Vihiga | 0.57 | |
| Nyandarua | 0.58 | |
| Kirinyaga | 0.6 | |
| Nakuru | 0.6 | |
| Kisii | 0.61 | |

| | | |
|-------------|------|--|
| Nyamira | 0.62 | |
| Uasin Gishu | 0.62 | |
| Nyeri | 0.64 | |
| Mombasa | 0.67 | |
| Kiambu | 0.68 | |
| Nairobi | 0.77 | |

Appendix 4: Weighting for the CDI index categories

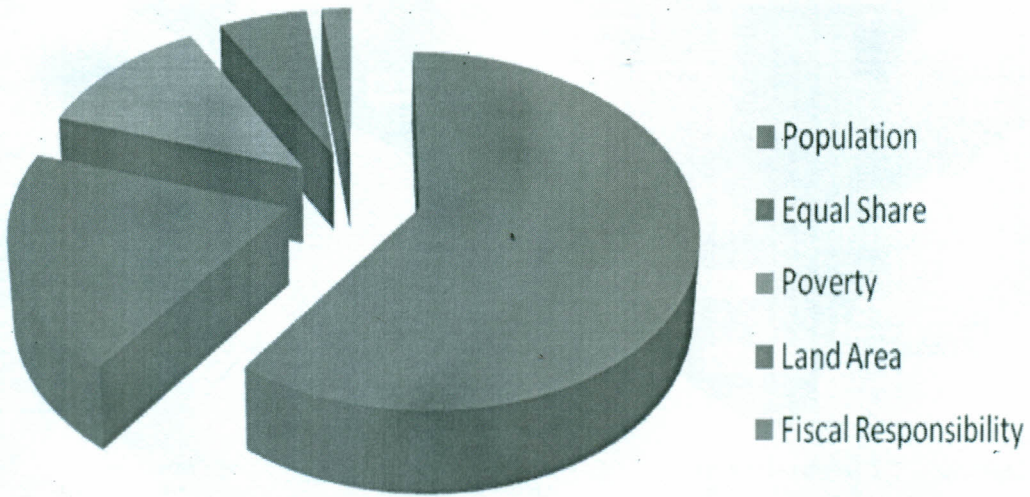
| Dimension | Weight (%) | Indicator | Weight (%) |
|----------------|------------|-------------------------|------------|
| Poverty(gap) | 16 | Poverty | 16 |
| Infrastructure | 28 | Roads network | 9.33 |
| | | Electricity connections | 9.33 |
| | | Water | 9.33 |
| Education | 28 | Literacy | 14 |
| | | Secondary education | 14 |
| Health | 28 | Skilled deliveries | 9.33 |
| | | Immunization | 9.33 |
| | | Sanitation | 9.33 |

Source: CRA criteria for identification of marginalized areas report.

Appendix 6: CRA allocation formula

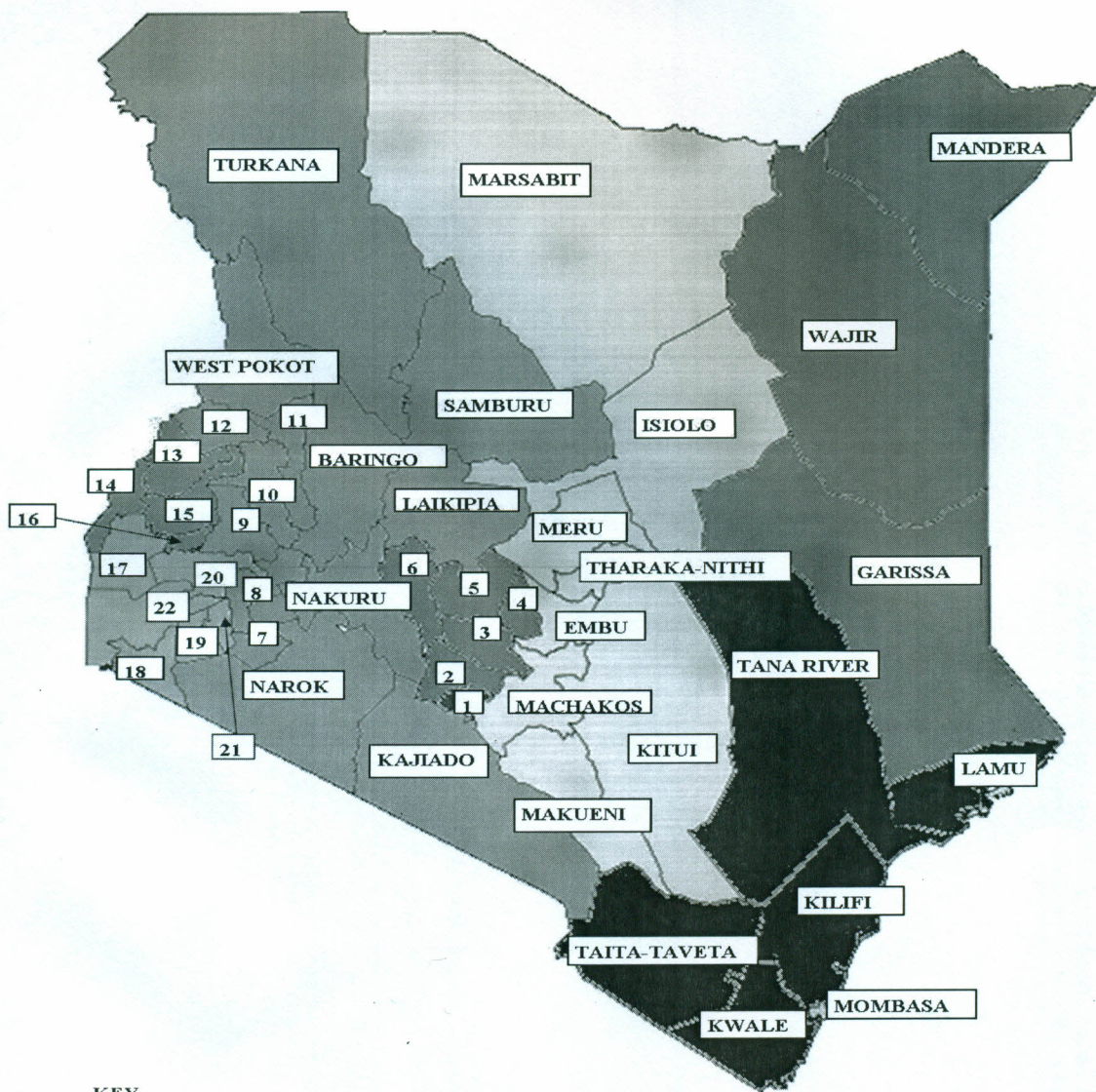
| Parameter | Weight |
|-----------------------|--------|
| Population | 60% |
| Equal Share | 20% |
| Poverty | 12% |
| Land Area | 6% |
| Fiscal Responsibility | 2% |

Weight



Appendix 7: Counties map

COUNTIES OF KENYA



KEY

- | | | | |
|--------------|---------------------|--------------|--------------|
| 1. NAIROBI | 8. KERICHO | 15. KAKAMEGA | 22. HOMA BAY |
| 2. KIAMBU | 9. TRANS NZOIA | 16. VIHIGA | |
| 3. MURANG'A | 10. UASIN GISHU | 17. SIAYA | |
| 4. KIRINYAGA | 11. ELGEYO-MARAKWET | 18. MIGORI | |
| 5. NYERI | 12. NANDI | 19. KISII | |
| 6. NYANDARUA | 13. BUNGOMA | 20. KISUMU | |
| 7. BOMET | 14. BUSIA | 21. NYAMIRA | |

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