AN ASSESSMENT OF THE FINANCIAL RESOURCE ALLOCATION CRITERIA FOR DISTRICTS HEALTH SERVICES IN ZAMBIA: FROM AN EQUITY PERSPECTIVE

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Declaration

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The thesis *"An Assessment of the Financial Resource Allocation Criteria to District Health Services from an Equity Perspective in Zambia",* is my own work.

Signature……

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Abstract

Background: As a way of increasing objectivity and transparency in the allocation of financial resources to district health services, the Ministry of Health introduced and implemented a Resource Allocation Formula (RAF) in 1994. Further revisions to the RAF were made in 2004 and 2008/09.

Objective: the main objective/aim of this study is to critically review the financial RA formula/criteria across districts in Zambia in order to assess its potential impact on equity and provide recommendations to the Zambian Government.

Method: A review of literature on health care financing and resource allocation criteria. Literature on resource allocation criteria is analyzed based on budget levels of allocation, releases and expenditures, as well as using the relevant existing theories on equity. A framework for assessment of the formula is introduced in chapter 5 in order to guide the discussion.

Result: The results of the study reveal that after its revision in 2008/09, the financial RAF was more resolute and equity focused as compared to the 2004 formula. However, despite the 2008 formula being more equity focused, its application is limited. Only three (3) districts had financial resources allocated in accordance with the formula while the other 69 districts continued receiving funds either above or below the formula. This suggests that resource allocation formulas are not always adhered to in actual allocations and releases of funds.

Conclusion and Recommendation: The formula has not comprehensively incorporated all important need areas, and is yet to be applied fully in Zambia. The study recommends the need to further revise the formula to link disease and demographic composition variables, while at the same time strengthening monitoring of the implementation process

Key words: Resource allocation, Equity, efficiency, Zambia

Word count: 11,586 Words

List of Abbreviations

ABB	Activity Based Budgeting
ANC	Antenatal Care
CSO	Central Statistical Office
CBoH	Central Board of Health
DALY	Disability Adjusted Life Years
DHMT	District Health Management Team
DHO	District Health Office
FNDP	Fifth National Development Plan
GDP	Gross Domestic Product
GNI	Gross National Income
HIV	Human Immune Deficiency Virus
HMIS	Health Management Information System
MDGs	Millennium Development Goals
MDI	Material Deprivation Index
MMD	Movement to Multi-Party Democracy
MoH	Ministry of Health
MoFNP	Ministry of Finance and National Planning
MSL	Medical Stores Limited
MTEF	Medium Term Expenditure Framework
NAC	National HIV/AIDs/STIs/TB Council
NHSP	National Health Strategic Plan
NGOs	Non-Governmental Organizations
PCA	Principal Component Analysis
PHO	Provincial Health Office
PPP	Purchasing Power Parity
RAC	Resource Allocation Criteria
RAF	Resource Allocation Formula
RASC	Resource Allocation Steering Committee
RATWG	Resource Allocation Technical Working Group
SNDP	Sixth National Development Plan
SWAp	Sector Wide Approach
tTBA	Trained Traditional Birth Attendant
TB	Tuberculosis
UNDP	United Nations Development Programmes
UNICEF	United Nations Children's Funds
WB	World Bank
WHO	World Health Organization
ZDHS	Zambia Demographic and Health Survey
ZISSP	Zambia Integrated Systems Support Program

Definitions

Financial Resource Allocation: The manner in which recurrent funds are distributed across geographical areas for health services at that level of care, (Witter et al, 2000).

Budget: A quantification of resources and associated costs of implementing a plan within a defined time frame, (MoH, 2004).

Equity: Everyone to have equal access (both geographical and financial) to existing health care facilities and services, (Witter et al, 2000).

Material Deprivation: Refers to a state of economic stress and durables, defined as the enforced inability to (rather than the choice not to do so) pay unexpected expenses, a meal involving meat, chicken or fish, adequate heating of a dwelling etc, (Eurostat, 2013).

Performance Based Financing: A way of financing health services that is result-oriented and practically ties payments to staff or beneficiaries based on their achievement of agreed upon, measurable performance targets, (World Bank, 2010)

Horizontal Equity: People with similar need should receive similar level of benefits (in terms of access, quality of care etc.) and those with similar income should contribute the same (in terms of financing health services): Equal treatment for all equals, (Witter et al, 2000).

Vertical Equity: People with different health needs be treated differently and those with different abilities to pay contribute different amounts; Unequal treatment for all unequal's, (Witter et al, 2000).

District Health Services: Essential health services that are provided at district level at cost that is affordable by the communities, (Witter et al, 2000).

Variables: Any aspect of an individual or household that is measured, like income, age, sex, blood pressure etc, (Kirkwood, 2003).

Principal Component Analysis: One of the most commonly used statistical methods for factor extraction by finding a few combination of variables, called components, that adequately explains the overall observed variation, and thus to reduce the complexity of data, (Kirkwood, 2003)

Inverse Care Law: The principle that the availability of good medical care tends to vary inversely with the need of the population that is served, may be applied to health care and resource allocation, with less

resources allocated to the poor and more to the rich", (Diederichsen, 2004).

Perverse Incentive: An incentive that can lead to behavior contrary to the goal of the public health policy. For example if performance indicators are incentivized, people tend to exaggerate their performances in order to get more resources, (Mclntyre, 2007).

Incremental Budgeting: Budgeting for a particular health service or facility on the basis of the previous budget but with a small increase just to take care of inflation/price increases, (Pearson, 2002).

Need-based Formula: A formula used to inform the allocation of health care resources among different geographic areas. It includes indictors for each area need for health care such as population size, age and sex composition of the population and its relative burden for ill health.

User Fees: A fee charged at the place and time of service use within a public health facility and paid on an out of pocket basis, (Mclntyre, 2007).

Introduction

The Zambian Government has since 1992 been implementing health sector reforms whose main purpose was to strengthen health service delivery and ultimately improve health status of the people of Zambia. As part of the package of the health sector reforms the government introduced and implemented a scientific formula to allocate resources across geographical areas in 1994. The formula has since undergone revisions in order to incorporate more key variables that adequately address equity in the distribution of resources. The need for further revisions has risen high on the policy agenda and this was exemplified by the 2011-2015 National Health Strategic Plan (NHSP) which emphasized on the need to refine the resource allocation formula in order to account for input costs.

I joined the Ministry of Health in November 2008 in the Planning and Budgeting Unit under the Directorate of Policy and Planning. The Planning and Budgeting is responsible for the mobilization and distribution of resources to all levels of service delivery including district level services. However, throughout my involvement in planning for the sector, allocating resources to districts has always provoked a lot of debates, of which a lot of queries and concerns remain unanswered. It is for this reason that I became very interested in broadening my understanding of the formula and be able to assess its efficiency in order to contribute positively to its on-going revision process.

I therefore joined a master program at the Royal Tropical Institute in order to enhance my skills and understanding of Public Health with its related issues and use the acquired knowledge to contribute in making positive changes in my area of work.

The masters course has attempted to answer most of the questions on the resource allocation to various health services and interventions, and hence I wish to take a deeper assessment on the variables presented in the Zambian resource allocation criteria in order to provide sound recommendations to the Zambian Government for effective decision making.

This paper is broken down into six (6) chapters. The first chapter contains the background information about Zambia; the second chapter presents the problem statement, Justification and the methodology of the study; chapter three (3) highlights the financial resource flows in the Zambia health system and the evolvement of the resource allocation formula to district health services; the fourth chapter presents the results of the study; the discussion then follows in chapter five (5) and; lastly the conclusion is made with recommendations in chapter six (6).

CHAPTER 1: BACKGROUND

This chapter presents background information about Zambia with respect to its geography, demography, political administration, economy, education and health situation.

1.1 Geography

Zambia is a landlocked Sub-Sahara African country sharing boundaries with eight (8) neighboring countries, namely; Malawi and Mozambique to the east; Zimbabwe, Botswana and Namibia to the south; Angola to the west; and the Democratic Republic of Congo and Tanzania to the north. The country covers a land surface area of 752,612 km^2. It lies between 8º and 18º south latitudes and longitudes 22º and 34º east. About 58 per cent of Zambia's total land area of 39 million hectares is classified as having medium to high potential for agricultural production, but less than half of potential arable land is cultivated. The country is prone to drought due to erratic rainfall, as its abundant water resources remain largely untapped. Zambia has some of the largest copper and cobalt deposits in the world, (CSO, 2010).

1.2 Demography

According to the 2010 Census of Population and Housing, Zambia has a total population of 13,092,666, representing an increase of 32% from the population of 9,885,591 recorded in 2000. The majority of the population 61% (7,919,216) reside in the rural parts of the country with the remaining 39% residing in the urban areas. Disaggregation of the population by sex shows that 49% (6,454,647) are males and 50% (6,638,019) are females. With the 45% of the population below the age of 15 years, Zambia's population is considered a young population with the potential for a continued growth. The population is currently growing at 2.8% annually. Although the national average population density stands at 17.4 persons per square kilometer, there are major variations across provinces with Lusaka province having the highest 100.0 persons per square kilometer and Copperbelt Province second with a population density of 63.0 persons per square kilometer. North-western Province has the lowest with a population density of 5.8 persons per square kilometer.

Table 1: Selected Demographic Indicators

Indicator	Status	Source
Population	13.1 Million	CSO, 2010
Sex Ratio (Males/ Female)	0.99	CSO, 2010
Annual Growth Rate	2.8%	CSO, 2010
Life Expectancy at Birth	51.3 years	CSO Projections
% of under 15yrs population	45.4%	CSO, 2010
Average Family Size		CSO, 2010

Source: (CSO, 2010)

1.3 Politics and administration

Politically, Zambia has undergone phases of both multi-party state and one party rule. The country, which is a former British colony, gained its independence in 1964. Administratively, the country is divided into nine provinces: Central, Copperbelt, Eastern, Luapula, Lusaka, Northern (now split into two provinces), North-Western, Southern and Western. These provinces are further subdivided into 72 districts.

1.4 Economy

Zambia has recorded major improvements in macro-economic performance, with annual economic growth rate averaging 6.2% per year over the past 6 years, (MoFNP, 2012). The World Bank recently classified Zambia as a lower middle income country as GDP per capita rose to $1,712 and GNI per capita to $1,620, (WB, 2012). Whilst the mining sector is the main source of growth other key sources include agricultural, construction, and the telecommunications sector. This positive situation notwithstanding, poverty levels are high in Zambia with the majority of the population 60.2% living below the poverty line, (CSO, 2010).

Worsening the above condition is the high prevalence of income inequalities in the country demonstrated by a Gini coefficient estimated at 0.53 compared to the Sub-Saharan average value of 0.46, (MoFNP, 2011). The Gini-coefficient is a measure of income inequalities in the population and it ranges from 0 to 1, with 0 representing highest equality across the population and 1 representing highest inequality.

1.5 Education

In Zambia, the central government remains the main providers of education at all levels with about 88% of the school attendants in the government schools. The private sector has also been increasing and is making significant contribution to the education sector at particularly college and university levels, (CSO, 2010). Overall, the net attendance rate for primary school level is 79%, whereas that for secondary school level is 44%. Gender disparities in school attendances continue to be noticed especially at secondary and tertiary levels where males tend to dominate. There are also rural- urban differentials, with urban attendances being consistently higher for all ages in primary and secondary schools, (CSO, 2010).

1.6 Health Situation

Zambia's disease burden is mainly driven by poverty related diseases and conditions such as malaria, HIV/AIDS, malnutrition and tuberculosis and diarrhoea. Malaria remains the highest cause of morbidity currently

contributing well over 40% of all diagnoses. With an increasing trend of non-communicable (NCDs), Zambia is being faced with a double burden of fighting communicable diseases and NCDs at the same time, impacting heavily on the human, financial and material resources available for health, (MoH, 2010). Below are some highlights of the disease situation.

1.6.1. Malaria

Malaria is endemic in Zambia with seasonal variations. Overall, Malaria cases reported (used as an inappropriate proxy for incidence) stands at 330 per 1,000 population per year, with hospital malaria case fatality rate recording at 34 per 1,000 admissions. In 2009 and 2010, malaria case fatality rate was higher in the age group 5 years and below than the age group 5 years and above, (MoH, 2010). In terms of disease burden malaria is the second leading cause of disability-adjusted life years (DALY), after pneumonia, with 5.1% share in the disease burden, (WHO, 2004)

1.6.2. Tuberculosis

Although tuberculosis (TB) programmes have had a positive impact on the TB situation in the country, with the treatment success rate as high as 86% against the MDGs target of 85%, the disease still remains a major public health concerns in Zambia. TB notification rates per 100,000 population has remained almost stagnant over the years recording at 378 per 100,000 population in 2008 to 377 per 100,000 population in 2009 and at 373 per 100,000 population in 2010, (MoH, 2010). The TB case detection rate has been improving and was in 2009 recorded at 58%, showing progress towards attaining the 70% target for the MDG. The defaulter rate and death rate stand at 3% and 7%, respectively. The rate of HIV testing for TB patients increased from 23% in 2006 to 72% in 2009, while the proportion of HIV positive TB patients receiving cotrimoxazole and ART, increased from 30% and 37% in 2006 to 63% and 42% in 2009, respectively.

1.6.3. HIV/AIDS

Zambia is among the most severely affected countries with HIV infections in the Sub-Saharan region. According to the Zambia Demographic and Health Survey (ZDHS) 14.3% of the adult Zambian population is HIV positive, with prevalence rates as high as 20% in urban areas and 10% in rural areas (CSO et al, 2007). The prevalence rate is higher among women (16%) than among men (12%). With the HIV prevalence rate in the Sub-Saharan Africa region standing at 5% on average, Zambia is one of the countries with a particularly high prevalence of HIV in the region (NAC, 2012). New infections are projected to increase from an estimated 67,602 adults in 2006 to 72,019 in 2015.

1.6.4. Maternal Health

Maternal Mortality ratio in Zambia stands at 591 per 100,000 births, as revealed by the results of the 2007 ZDHS. The provision of integrated reproductive health remains a major priority for the health sector. Through the Ministry's concerted efforts to increase access to integrated reproductive health and family planning, antenatal coverage in 2009 was at 94 percent with antenatal care visits averaging 5.4 visits per pregnancy. The percentage of institutional deliveries has remained stagnant between 2008 and 2010 at 45%, (MoH, 2010)

As regards to maternal health and family planning, supervised deliveries increased from 60% in 2008 to 67%t in 2009 and then reducing to 57% in 2010. Deliveries assisted by Trained Traditional Birth Attendants (tTBAs), declined slightly by 2 percentage points between 2008 and 2010. Furthermore, first antenatal coverage also reduced between 2008 and 2010 from 98% to 85% in 2008 and 2010, respectively, (MoH, 2010).

Table 2: Deliveries attended by health personnel by province, 2008-2010

Province	Institutional deliveries (%)			Trained traditional birth attendants (tTBA) %			Supervised deliveries (%)		
	2008	2009	2010	2008	2009	2010	2008	2009	2010
Central	38	35	43	20	30	15	58	65	58
Copperbelt	56	56	52	10	14	12	66	70	64
Eastern	42	45	49	20	38	13	62	83	62
Luapula	42	42	39	22	32	15	64	74	54
Lusaka	64	62	49	4	10	8	68	72	57
Northern	33	33	31	24	13	23	57	46	54
North-Western	43	48	43	15	57	16	58	105	59
Southern	35	40	39	14	19	14	49	59	53
Western	49	36	54	8	14	5	57	50	59
Zambia	**45**	**44**	**45**	**15**	**23**	**13**	**60**	**67**	**57**

Source: MoH Statistical bulletin, 2010

1.6.5. Child Health

Child mortality and infant mortality rates stand at 119 and 70 per 1000, respectively. This was according to the 2007 ZDHS results released in 2008. The high rates were largely attributed to neonatal complications, malaria, diarrhoea, pneumonia, anaemia, malnutrition and poor maternal health. Furthermore, only 20% of mothers attend post-natal care after two weeks, thereby compromising opportunities for child survival. Other factors compromising child health were the high prevalence of HIV and AIDS, with close to 7,000 new paediatric infections per year.

CHAPTER 2: PROBLEM STATEMENT, OBJECTIVES AND METHODOLOGY

2.1 Problem Statement

Traditionally, resource allocation in the Zambian health sector, as in many other sectors, was largely based on fixed incremental criteria to account for inflation and in some cases to offset rising operating costs, be it at provincial or district levels. It was not until the early and mid-1990s that a new school of thought emerged which thought it was generally more appropriate to start allocating resources proportionately to the population served. An MOH policy document of 1992 stipulated the need to achieve a more equitable mechanism for the distribution of health services countrywide, (MoH, 2004)

The major challenge is how to allocate limited health resources in an equitable and effective manner as a way that ensures the delivery of quality health services. In 1994, district resource allocation criteria applied district population, weighted for density, multiplied by an agreed per capita allocation, and then presence of a second or third level hospital also having a weight on the allocation. In 1995, more parameters were added to account for an index of fuel prices as a proxy for cost differentials between districts. Other parameters included proneness to cholera or dysentery and presence of a bank and/or a filling station in a district, (MoH, 2004).

The allocation criteria was further criticized for not being flexible enough to address the varying levels of deprivation and vulnerability, the utilization of inputs such as human resources, number of health facilities and disease burden. In addition, districts which are remote and have far-off areas with relatively high administrative costs were not given special attention, (MoH, 2004).

In 2004, the Ministry of Health developed a new resource allocation criterion for the districts which was first applied in 2005. The formula, which took into consideration a weighted Material Deprivation Index (MDI), attempted to incorporate the prevailing poverty situation, disease burden and the population size (Chitah and Masiye, 2007).

Despite having developed and implemented the new formula, debates still continued in technical meetings. The revision exercise was however, delayed after the demise of the Central Board of Health (CBoH) in 2006. This was partly because the Resource Allocation Technical Working Group (RATWG) which was put in place, comprising a wide range of key stakeholders, to develop the formula and oversee the process of allocating resources, was also dissolved during the restructuring process of the MoH, (Chitah and Masiye, 2007).

In 2008, a team of consultants was engaged to make a revision to the design of the formula so as to incorporate variables of access to health facilities. The revised formula was first applied in 2009 for the 2010 budget and has since been used in the allocation of resources across districts as part of the national health budget development process, (MoH, 2011). Allocation of resources within the district is based on guidelines which stipulate the proportions of resources to be spent at the district office, first level hospital, health center and community. The guidelines and resource allocation criteria/formula for the allocation of financial resources to districts are restricted to non-salary recurrent budget/expenditure and therefore do not include neither capital expenditure, nor personal emoluments for health facility and district hospital staff, (USAID, 2010).

The extent to which the formula has been effectively implemented to address the concerns raised earlier has not been fully explored to date. It is therefore the purpose of this study to critically review the implementation process of the most recently revised resource allocation criteria, now used to distribute financial resources across districts in Zambia, and to assess its a priori importance to equity.

2.2 Justification

In its quest to increase access to health facilities in the rural and remote areas, in April 2006 the Government of Zambia abolished user fees in all the fifty four (54) districts in Zambia which were classified rural. This followed a presidential pronouncement on January 1st 2006. The user fees removal policy was further extended to peri-urban areas in 2007. As part of the measures to generate compensatory revenue to offset losses due to the abolition of user fees, the government requested cooperating partners to increase their allocations for the District Health Sector Budget, (Mclntyre D, 2008).

However, the abolition of user fees was, in early 2009, followed by a sudden withdrawal of cooperating partners' support to the health budget due to unresolved issues with the Ministry of Health resulting from alleged misappropriation of donor funds by some senior officers at the ministry. This development resulted in serious financial constraints which saw some of the institutions, including training schools, temporarily closing down, (WB, 2010). The overall budget in 2009 reduced by about half since the donor community had committed about 50% of the total health budget for the year, (MoFNP, 2009). This meant that the total resource allocation to the districts also reduced as it is given as a proportion (60%) of the total budget.

Faced with a decline in the resource envelop in the health sector, the Zambian government was under massive pressure to adequately finance

the provision of essential health services and promote efficiency, achieve equity and improve the delivery of quality health care services. The rational and transparent allocation of resources to district health services has therefore become more important than ever before. Several debates and ideas on a more equitable distribution of funds for district health services have continued to be top on the agenda. As part of the key strategies of health care financing, the Ministry of Health needs continuous reviewing and strengthening of the resource allocation to adequately address issues of unpredictable fiscal space and uncertainty of donor funding, (MoH 2011).

However, it is also recognized that resource allocation criteria are not the only key factors impacting the distribution of health and health outcomes of the population: also other factors such as the institutional framework, service delivery organization, policy environment, as well as the Social Determinants of Health (SDoH) all contribute. The distribution of resources never-the-less, remains a key aspect of health care financing and the impact of resources on health care and health outcomes.

"The 'inverse care law', which is the principle that the availability of good medical care tends to vary inversely with the need of the population that is served, may be applied to health care and resource allocation, with less resources allocated to the poor and more to the rich", (Diederichsen, 2004). It is a paradox which entails that invariably, the poor people with the largest share of the burden of ill health tend to receive the smallest share of health resources. In short, health care resources are distributed inversely in related to need. However, what now becomes a core issue to both within domestic health systems and internationally is the question of how fairly resources are allocated across different sub-groups of the population.

Improving equity in population health has been identified as a key purpose of almost all health systems (Robert et al, 2004). In support of this objective are policy commitments that have been made domestically, regionally and internationally. Example of these policy commitments are, commitments to achieve universal access to health care in general and also universal access to antiretroviral therapy to be more specific, (Chitah B, 2010). McIntyre et al. (2001) have argued that, "to make positive impact on health care and health status, the principles of resource mobilization and resource allocation should be based on vertical equity, which has been explained later on in this paper. Allocation of the resources can then be constructed to take into account these principles and values".

The way a country allocates its financial resources to health services has a major bearing on who enjoy health services most. No matter how good

National Policies and Strategies are set, financial resource allocation criteria also determine whether the poor will enjoy the services or not. According to Pearson (2002), health financing impacts on this goal in two ways:

- On the supply side by ensuring that essential services are adequately funded and delivered; and
- On the demand side by reducing financial barriers to access and by making sure that funds are raised and services delivered in ways which are affordable to all, (Pearson, 2002).

2.3 Study Objectives

Given the above background, this study therefore, attempts to critically review the resource allocation criteria used to distribute financial resources across districts in Zambia. It assesses whether the concept of need was adequately incorporated in the formula in order to highlight areas where change in design or process may be beneficial.

2.3.1. Overall Objectives

To critically review the financial resource allocation criteria for district health services in Zambia prior to and after its implementation in order to assess its potential impact on equity and to provide recommendations to the Zambian Government.

2.3.2. Specific Objectives

1. To describe and discuss the resource allocation criteria and changes over time within Zambia and critically discuss their a priori importance for equity;
2. To describe and analyze inter-district resource allocation flows in terms of resources budgeted and released to districts and actual expenditure patterns ;
3. To assess the extent to which budgets, releases and expenditures conform to resource allocation criteria and guidelines (including intra-district distribution of financial resources) and discuss reasons for deviations;
4. To provide recommendations to the Zambian Government on further adaptations in the resource allocation criteria based on the findings of this study.

Each of the above stated specific objectives are addressed in details in the chapters that follow. Chapter 3 of this paper attempts to discuss and address the issues relating to the objective number 1, whereas objectives 2 and 3 are discussed and analyzed in chapter 4. Chapter 5 is basically providing a discussion of the results and key findings of the research.

Lastly, chapter 6 gives a conclusion and makes recommendations based on the findings in order to address objective 4.

2.4 Methodology

2.4.1. Research Design

This study is based on a review of literature on health care financing and resource allocation criteria. The study benefits from various sources of information which include journals, published articles, existing databases, studies and reports. Literature on resource allocation criteria is analyzed based on budget levels of allocation, releases and expenditures, as well as using the relevant existing theories on equity. A framework for assessment of the formula is introduced in chapter 5 in order to guide the discussion.

2.4.2. Search Strategy and Data Sources

Review data on the resource allocation criteria in Zambia was searched and accessed through Activity Based Budgeting (ABB) databases, the health management information system and other documents covering health economics and systems, social sciences and socio-economic data. The stated information was accessed from published peer reviewed literature, grey literature, organization/government websites, WHO website and ABB Databases from Ministry of Finance and National Planning. Search strategies included looking for terms with the subject titles and other terms relating to equity and resource allocation. The information collected mostly pertains to Zambia and other countries of similar characteristics to Zambia in the sub-Saharan region.

2.4.3. Financial Years Considered for Analysis and Selection of Kenya for Comparison

The purpose of this study is to assess the implementation of the revised financial resource allocation formula which was first applied in 2009 in the development of the 2010 budget. In assessing its outputs, the study also tries to compare the current with the previous formula which was developed in 2004 and first applied on the 2005 budget. For this reason four financial years are selected for analysis, with two years prior to the implementation of the new formula and the other two years within the implementation period of the formula. Generally years were selected based on data completeness and availability, especially on expenditure information which is rarely captured in reports. For instance, 2012 would have been ideal to include, but lack of complete information on releases and expenditures by districts has led to its exclusion from the analysis.

Another simple criterion used in the selection is looking at years where major changes were made to the formula. Therefore, 2005, 2008, 2010 and 2011, were conveniently selected, after taking into account all the above stated considerations. However, no budget release and expenditure information was available for 2005, so it was left out in some areas of analysis. On the other hand, 2011 was special in the sense that it partly affected by the 2011 elections and was also the year that witnessed the introduction of the Integrated Financial Management Information System (IFMIS) in MoH.

Kenya has been used for comparisons because of almost similar income levels with Zambia. The two have been classified low-middle income countries with their GNI and GDP per capita at purchasing power parity (PPP) recording around $1,700, (WB, 2012). In addition, Kenya is among the few countries in the region applying a similar need-based allocation criteria to Zambia, with most of other countries still in the phase of formally developing and implementing need based allocation criteria to health services, (Equinet Discussion Paper 52, 2007).

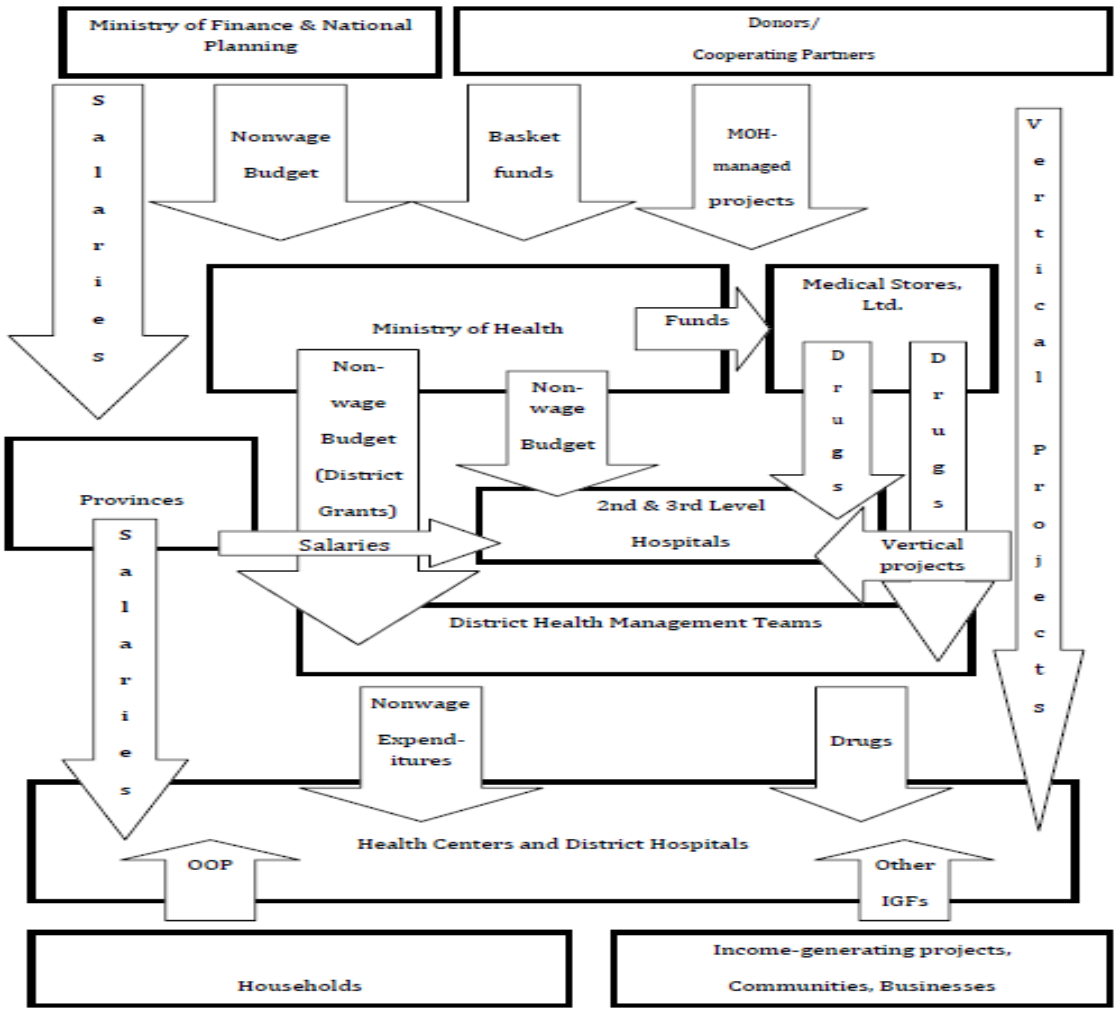
CHAPTER 3: GOVERNMENT RESOURCE ALLOCATION IN ZAMBIA AND EXPERIENCES IN KENYA

3.1. Health Care Financing in Zambia

The health sector in Zambia competes for government funds with all other sectors in the country such as education, agriculture, manufacturing, mining sectors etc. Every year, before the beginning of sector planning processes, the government of Zambia through the Ministry of Finance and National Planning releases the Green paper. The Green paper provides an opportunity for the government to consult all stakeholders on the course of action with regards to the country's development agenda, within the Medium Term Expenditure Framework (MTEF), (MoFNP, 2008). This document also provides indicative financial ceilings to respective sectors for use in the planning and budgeting process for the three years MTEF period. The public funds spent on the health sector from the total government expenditure has been fluctuating around 10% in the past five years, which is below the Abuja recommended target of 15%, (MoH, 2012).

The flow of funds in Zambia's health sector is complicated and fragmented as can be observed from Figure 1 Salaries, drugs, and other recurrent expenditures are disbursed separately by different agencies. MOFNP provides salaries directly to the Provincial Health Offices, which then remit these to their health centers, first-level district hospitals, and second- and third-level hospitals (Figure 1). MOFNP provides the budget for other recurrent expenditures directly to MOH while cooperating partners provide the budget for other recurrent expenditures through the basket fund to MOH, although it is currently not functional following the suspension of donor support to the sector. These basket funds are allocated in tandem with Zambian funds, and are managed and monitored closely through a joint monitoring framework. MOH provides running costs (using Zambian and basket funds) to DHMTs and second- and third-level hospitals. The DHMTs, in turn, provide running costs and drugs (which they obtain from Medical Stores Limited (MSL)) to the health centers and district hospitals. Additional resources come from separate projects implemented by MOH, vertical projects implemented by donors or contractors and internally generated funds of health facilities.

Figure 1: Flow of Funds and Other Resources in Zambia's Government Health Sector

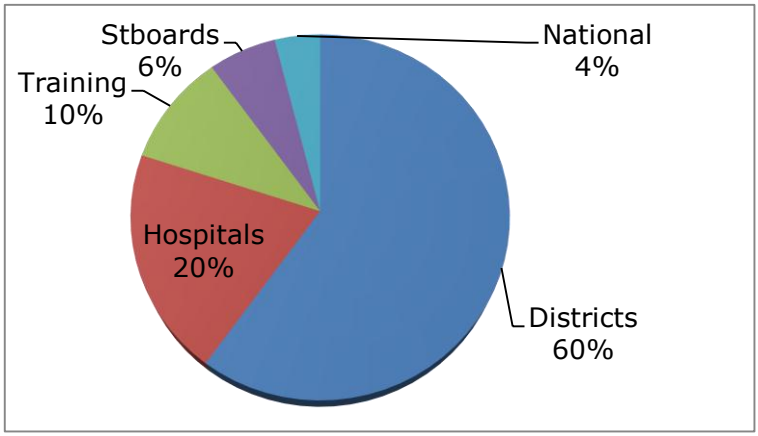


Source: MoH, 2006

3.2. Allocation by Level of Care

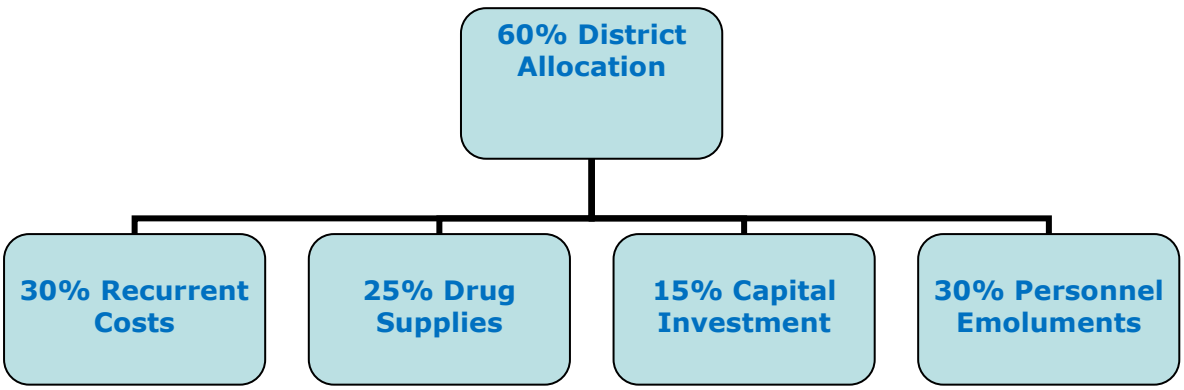
While objective criteria for geographical allocation of resources have been applied to the portion of the budget earmarked for districts, the rest of the budget process has been less clear. In terms of determining the appropriate proportion of funding to go to districts vis-à-vis other levels of the system, decisions have been made on a largely *ad hoc* basis. However, the policy of the Ministry of Health has been to increase the proportion of funding going to the districts and reducing funding to second and third level referral hospitals on grounds of efficiency and equity. To this effect it was considered that at least 60 percent of total public health sector financial resources would need to go to districts. As a general guideline, the budget allocation by level of care is as illustrated in the figure below, (MoH, 1993, 2011).

Figure 2: Health Sector Budget Allocations



The 60 percent allocation to district includes three main budget categories/lines: A. Recurrent costs (mainly), which are transferred directly to districts as per existing resource allocation criteria; B. Drug supplies budget line, which is managed at the central level on behalf of districts for procurement of standard Basic Health Care Items (drugs, vaccines, medical supplies, medical & non-medical equipment, transport etc); and C. Personnel emoluments directly from the ministry of Finance to districts as per human resource establishment. The allocation to this follow the guidelines provided in figure 3.

Figure 3: Composition of the total district allocation, 60% of the total health resources



The allocation of drugs and medical supplies to districts accounts is based mainly on districts population and the procurement and distribution is mainly handled by Medical stores. Districts do elaborate budgets for drugs but funds are actually controlled by the Ministry of Health and MSL at the national level and no financial transaction in reality takes place between medical stores and the districts. The districts are allowed to purchase a limited amount of drugs (not more than 4 percent of the total budget) on the open market, which allows them to purchase drugs that MSL is unable to provide.

3.3. Inter – District Allocations

To allocate financial resources across districts, the Ministry of health resource allocation formula was first developed in 2004 and further revised in 2008/9 to bring about objectivity and transparency in the allocation of finances across districts. This resource allocation formula is meant to ensure/guarantee that districts with higher population figures and districts with greater poverty incidence get a larger share of allocation of resources compared to districts with lower population and/or poverty levels. The formula also need to take into account other demographic and social-economic factors which are key considerations in the distribution of resources and will be discussed in detail later on in this chapter.

3.4. Intra – District Allocations (Recurrent Budget)

The proportional allocation of funds within districts follows the planning and budgeting guidelines which are given to the districts in the form of ceilings for planning and budgeting purposes. The extent to which districts adhere to these guidelines will be analysed further in section 4.2 of chapter 4 on intra-district allocation conformity to resource allocation criteria/guidelines.

Table 3: Ceilings for Intra-district Allocations of GRZ grants

Levels	Range (min-max allowed)
District administration	15%
District Hospitals	20-40%
Health Centres	45-60%
Community	10-15%

Source: MOH District Planning Guidelines, 2008 and 2011

3.5. Evolvement of the Resource Allocation to Districts in Zambia

3.5.1. The Initial Resource Allocation Criteria

The need to develop mechanisms for improving the equitable distribution of resources in the Health Sector was proposed in the *National Health Policies and Strategies* (MOH 1992) and the need to refine and strengthen mechanisms for resource allocation has been discussed sporadically since the advent of reforms. Early moves to design and implement transparent and objective means of allocating government resources took place within the context of a routine annual government-wide budget process, but in addition they were seen as an integral part of the decentralization process.

Decentralized planning and budgeting evolved out of the need to link planned budget allocations to health sector objectives at the national level

and to ensure that adequate funds reached the district level. Up to 1993, funds for district level health services delivery were channeled through the provincial Accounting office and Provincial Medical Offices had to compete with the provincial branches from other government ministries and agencies for the limited funds sent to the province from Ministry of Finance.

As is the case in many developing countries, sectoral budgets in Zambia have traditionally been determined in an "incremental" manner, whereby historical allocations to specified line items, or inputs, were increased by a percentage to account for inflation. In the early 1990s, however, following questions in Parliament, the Budget Office started allocating money to provinces on the basis of some form of allocation criteria; so for primary education it was basically the number of pupils, for police it was population, for agricultural extension it was farming families, and so on. Although population is believed to have been used as the basis for funding health, this does not seem to have been worked out well in practice.

At the MOH annual budget workshop in September 1993, MOF staff presented figures indicating the range of per capita provincial allocations to health in 1993. After deductions for salaries, it became clear that Lusaka Province received much less per head (excluding the two central hospitals) compared with North-Western Province, resulting in a more than 18-fold difference. This difference will however become less pronounced if central hospitals are included (as they should, since in fact central hospitals primarily serve their immediate population as was illustrated by a study conducted by Atkinson et al. 1999). On the one hand, Central hospitals also provide primary care services (Level 1), for patients that are not referred – which in fact they should not; on the other hand, they receive referred patients not only from their own district, but also from other places, referred to them for specialized tertiary services.

Concern about improved allocation and use of resources was expressed in the ruling party's (MMD) health strategy paper, as well as in the original MOH policy document in 1992, which points to the need for the government to consider how to achieve a more equitable mechanism for the distribution of resources for health care." (MOH 1992)

As a result of seeing the inequalities arising under the provincial budgeting system, it was decided to recentralize control of all funding for health services under the MOH permanent secretary from 1994. This was done both to be able to apply more rational criteria for the geographical allocation of financial resources within the sector and to enable the introduction nationwide of district grants. So, in 1994, the Ministry of Health started allocating district grants on the basis of population size,

weighted by density. Other factors, such as presence of a bank and a second or third level hospital in the district, were eventually included in the resource allocation criteria. Each district with certain peculiarities as defined below is first allocated a weight, as a kind of correction factor, which is guided by the following criteria:

(i) +10% for low density districts
(ii) ± 5% according to index of fuel prices (as a proxy for cost differentials)
(iii) + 5% for districts prone to cholera or dysentery
(iv) + 5% for districts without a bank and/or service station (as a proxy for remoteness)

The weighting is then multiplied with the district population to arrive at the weighted population. For instance, if a district has all the peculiarities stated above, the total correction factor would be +25% and this will be the additional percentage (weight) to the district population. Each district is then allocated a percentage of the total grant equivalent to its weighted population as a proportion of the total weighted population.

Initially, districts with a second- or third-level referral hospital were given 20% less than the budgetary allocation to adjust for existing infrastructure, which was directly transferred to the respective hospitals. After 1997, this practice was discontinued to allow the districts to directly contract higher level hospitals for the provision of referral services.

3.6. Revision of the Resource allocation Criteria

3.6.1 The 2004 Revision

There were discussions within the MOH and CBOH over several years regarding the need to revise the relatively crude mechanism for geographical financial resource allocation. The areas, which were earmarked for consideration included:

- The need for objective criteria regarding the share of funds to be apportioned to districts with or without referral hospitals
- Incorporation of poverty and/or vulnerability criteria
- Linkages with cost-sharing policy and practice
- Problems in "small districts" where administrative costs are high relative to the proposed population-based allocation

In 2004, the Ministry of Health developed a new formula for allocating resources to the districts for recurrent departmental budgets, which takes into account some of the issues raised above. The formula involved the use of a material deprivation index derived by using a multivariate statistical technique called Principal Components Analysis (PCA). The use

of the new resource allocation formula was meant to guarantee that districts with higher population figures as well as those with greater poverty levels would be allocated more financial resources compared to districts with smaller populations and/or lower poverty levels (MoH, 2004).

The demographic and socio-economic variables included in the formula were obtained from the National Census, the Living Conditions Monitoring Survey (LCMS), and the Health Management Information System (HMIS). Both the census and the LCMS provided data at two levels; household and individual. District level data were derived from these data sets. Variables, which would best help in identifying the disadvantaged, were selected from these.

One important variable included was the poverty head count, P_0, which is simply a head count ratio indicating the proportion of people that are living below the poverty line. Persons who live in households with monthly adult expenditure equivalent of K47,187 ($10) are considered poor, (MoH, 2004). After applying the PCA, only variables with high communalities were selected for inclusion in the formula. Communalities are one of the basic statistics used in the PCA to determine reliability of variables, ranging from 0 to 1, with 0 explaining the weakest link. Table 4 shows the variables used in the 2004 resource allocation formula.

Table 4: Variables used in deriving the Material Deprivation Index

Variable	Source
Poverty Headcount Index	LCMS
Proportion of hhds with house of poor material	LCMS
Proportion of hhds with no electricity/gas/solar for lighting	LCMS
Proportion of hhds with no electricity/gas/solar/candle for lighting	LCMS
Proportion of hhds using electricity/gas/solar for cooking	LCMS
Proportion of hhds without electricity	LCMS
Proportion of hhds without car	LCMS
Proportion of hhds without radio	LCMS
Proportion of hhds without TV	LCMS
Proportion of hhds without plough	Census data
Proportion of hhds without safe toilet	LCMS
Proportion of hhds without safe water source	LCMS
Proportion of hhds more than 5KM to primary school	LCMS
Proportion of hhds more than 5KM to food market	LCMS
Proportion of hhds more than 5KM to boat/bus/tax transport	LCMS
Literacy rate	LCMS
Population	Census data
Malaria cases reported	HMIS
Non bloody diarrhea cases reported	HMIS
Eye infection	HMIS
Health staff contact rate	HMIS

Source: Ministry of Health, 2004

The Principle Components Analysis is a multivariate statistical technique that permits one to find a linear combination of variables (i.e. Component) that accounts for as much variation in the original variables

as possible. It then finds another component, uncorrelated with the first, which accounts for as much of the remaining variation as possible. The iteration goes on until there are as many components as the number of the original variables. The expected outcome of this analysis is that a few components will account for most of the variation and these components can be used to replace the original variables. In the international literature, the principle components analysis is the commonest technique for deriving a country specific deprivation index. To develop the formula based on this, the ministry of Health worked in collaboration with the Central Statistical office using an SPSS- Principle Component Analysis.

The deprivation indices were then normalized and used as district population weights as in the formula below, (Normalizing involves adding a constant to all the districts deprivation indices such that the least number becomes 1 or has zero effect on the population).

DiA = RT*(niMD*Popi)/TwPop
Where:
DiA = Weighted resource allocation for district i
RT = Total resources available
niMD = material deprivation index normalized for district i
Popi= Populations size for district i
TwPop= Total weighted population

Using the formula, districts were then ranked and categorized into quintile as shown in Table 5, with Quintile 1 being the least Deprived districts and quintile 5 are the most deprived districts:

Table 5: 2004 Classification of districts by quintile using District Deprivation Indices

Quintile 1	DI*	Quintile 2	DI	Quintile 3	DI	Quintile 4	DI	Quintile 5	DI
Livingstone	-3.09	Monze	-0.18	Luangwa	0.33	Mporokoso	0.53	Zambezi	0.72
Lusaka	-2.85	Kasama	-0.04	Mpika	0.38	Isoka	0.57	Mungwi	0.73
Kitwe	-2.79	Kalomo	0.03	Mambwe	0.42	Kaoma	0.61	Kabompo	0.74
Mufulira	-2.74	Mumbwa	0.05	Kawambwa	0.42	Chinsali	0.62	Mwinilunga	0.74
Chililabombwe	-2.69	Siavonga	0.06	Solwezi	0.43	Nyimba	0.63	Senanga	0.74
Chingola	-2.64	Sinazongwe	0.07	Sesheke	0.44	Petauke	0.64	Kaputa	0.75
Luanshya	-2.51	Chipata	0.09	Mbala	0.47	Lufwanyama	0.65	Lundazi	0.78
Ndola	-2.5	Mongu	0.1	Itezhi-Tezhi	0.47	Katete	0.65	Chilubi	0.8
Kabwe	-2.17	Mansa	0.16	Gwembe	0.48	Nchelenge	0.65	Kalabo	0.8
Kalulushi	-2.08	Chibombo	0.17	Masaiti	0.49	Mufumbwe	0.65	Lukulu	0.83
Kafue	-1.81	Mkushi	0.24	Serenje	0.5	Samfya	0.66	Chiengi	0.9
Mazabuka	-0.6	Namwala	0.27	Mwense	0.52	Milengi	0.7	Chama	0.91
Chongwe	-0.46	Kapiri Mposhi	0.29	Luwingu	0.52	Chadiza	0.71	Chavuma	0.92
Choma	-0.39	Nakonde	0.31	Kasempa	0.52	Mpulungu	0.72	Shangombo	1.09
		Mpongwe	0.33	Kazungula	0.52				

Source: MoH, 2004.
Note: DI= District Deprivation Index

3.6.2 Further Revision in 2008/9

As part of the ongoing revision exercise, in 2008/9 the Ministry of health made some further revisions to the district resource allocation formula by including factors of geographical deprivation (such as access to facilities) which were missing in the 2004 formula. When the results, using the same techniques (PCA), were presented after the inclusion of variables on geographical deprivation, they showed hardly any changes in the components selected after running the PCA technique mentioned above. However, changes were very visible when it came to the calculated district deprivation indices after inclusion of the additional variables, (MoH, 2009).

Table 6: 2009 Classification of districts by quintile using District Deprivation Indices

Quintile 1	DI*	Quintile 2	DI	Quintile 3	DI	Quintile 4	DI	Quintile 5	DI
Lusaka	-4.65	Mkushi	-0.31	Mumbwa	0.45	Lufwanyama	0.96	Kasempa	1.15
Kitwe	-4.53	Monze	-0.29	Sesheke	0.5	Mporokoso	1.03	Luwingu	1.16
Livingstone	-4.24	Chipata	-0.17	Kawambwa	0.54	Nchelenge	1.03	Mwense	1.25
Chililabombwe	-3.84	Masaiti	-0.1	Petauke	0.55	Zambezi	1.04	Kapombo	1.26
Ndola	-3.81	Mpika	0.07	Mansa	0.56	Lundazi	1.04	Gwembe	1.26
Kafue	-3.68	Kasama	0.09	Mufumbwe	0.58	Siavonga	1.05	Chinsali	1.29
Luanshya	-3.68	Mongu	0.13	Namwala	0.65	Kazungula	1.05	Kalabo	1.31
Mufulira	-3.62	Mambwe	0.15	Katete	0.67	Luangwa	1.06	Lukulu	1.33
chingola	-3.51	Kapiri Mposhi	0.23	Samfya	0.69	Chama	1.06	Chilubi	1.34
Kabwe	-3.13	Solwezi	0.27	Nyimba	0.7	Senanga	1.07	Milengi	1.37
Kalulushi	-2.94	Nakonde	0.29	Isoka	0.75	Mpongwe	1.09	Kaputa	1.38
Mazabuka	-1.63	Sinazongwe	0.34	Mpulungu	0.77	Serenje	1.1	Mwinilunga	1.39
Chongwe	-1.46	Itezhi-Tezhi	0.35	Mbala	0.78	Chadiza	1.1	Shangombo	1.39
Chibombo	-0.51	Kalomo	0.41	Kaoma	0.88			Chiengi	1.4
Choma	-0.43							Mungwi	1.5
								Chavuma	1.66

Source: MoH, 2009.
Note: DI= District Deprivation Index

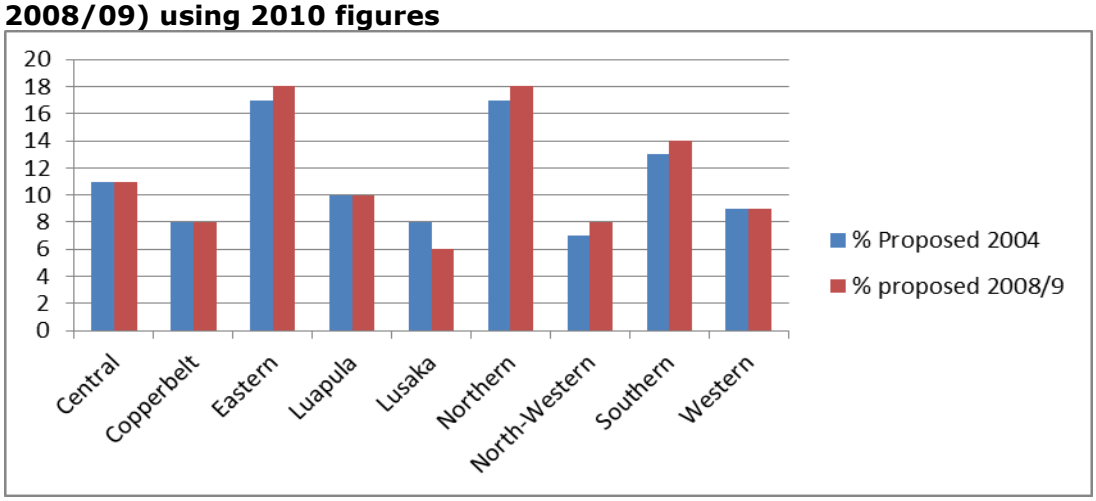
Table 6 above shows the same districts classified by quintile, but now using the material deprivation index after the inclusion of the geographical variables Compared to the previous table (Table 5), Livingstone has now dropped from first to third position in the first quintile, with Lusaka appearing as the least deprived district in the country. More importantly to note are districts like Gwembe, Luwingu, Kasempa and Mwense which were appearing in the third quintile in table 5, and have been pushed to the fifth quintile in table 6 which used the district deprivation indices calculated by the new formula.

In order to compare the effects of the changes on allocations, figure 4 demonstrates the differences in terms of the financial allocations to districts in 2010 as a percentage of the total district recurrent budget allocation for the whole of Zambia, for 2 situations: using the 2004 formula (assuming it had not been revised), and also using the revised formula. As can be observed from graph 4, the percentage allocation to

district in Eastern, Northern, North-Western and Southern provinces is higher (red bars) compared to what they would have received had the 2008/09 formula not been applied (blue bars). Three of these four provinces come out with the largest allocations.

Lusaka Province is the only province that has had a reduced percentage allocation due to the revision of the formula. The remaining three provinces have similar budget allocations, implying that they were not affected by the changes in the formula: weather this is an improvement in equity in the distribution of resources, is something that we will come back to partly in chapter four and in the discussion part of this paper.

Figure 4: Comparison in proposed allocation by the two formulae (2004 and 2008/09) using 2010 figures



3.7. Resource allocation in Kenya

An incremental approach to district allocation of health resources has historically been used in Kenya for resource allocation to the districts. Kenya introduced a resource allocation criteria formula in an effort to have a more needs based focus in allocation of resources in 2000. This resource allocation criterion takes into account weighted variables as shown in table 7 below, (Kenya MoH, 2009).

Table 7: Weighted variables in Kenyas' Resource Allocation Criteria

Vote 317 – District Hospitals		Vote 335 – Rural Health Facilities	
Variable	**Weight**	**Variable**	**Weight**
Poverty rate	0.20	Infrastructure	0.15
Bed use	0.40	Under-5 population	0.20
Outpatient case load	0.20	Poverty rate	0.30
Accident area	0.05	AIDS cases	0.05
Fuel costs	0.15	Females of reproductive age (15 to 49)	0.20
		Area of district (sq. km.)	0.10
Total	**1.00**	**Total**	**1.00**

Source: Kenya MoH, 2009

Some challenges faced with this system include poor data quality; high level of aggregation of data thus obscuring inequities to health and resources occurring at levels below the aggregation level; and inadequate training of ministry officials in use of the formula leading to errors in allocation, (Chuma and Okungu, 2011).

Budgeting at district level in Kenya occurs during the Annual Operational Planning (AOP) process and determines the amount of funds requested by the districts. There tends to be disparity between the amounts allocated using the resource allocation criteria formula and the amount requested by districts based on their AOP process. This is due to the fact that two processes use different indicators and varied data sources. As opposed to the resource allocation criteria mentioned above; the district budget requests are based on service delivery rates, case fatality rates, previous funding levels and stock outs in logistics. Districts source this data from the health management information system (HMIS), their own databases and from development partners. These non-standardized data sources further contribute to variations in estimating district budget requests, (USAID, 2010).

Further disparities are observed when the actual disbursements or releases (referred to as authority to incur expenditure: AIE) are compared with budget requests. In some cases the AIE fell severely short of district budgets by as high as 22.4% in Fiscal Year 2008/2009 for Kisumu East), (USAID, 2010).

A review of the literature shows that despite the existence of resource allocation criteria formula Kenya still uses the incremental approach for allocation of health resources. While the resource allocation criteria formula reduces the element of inequity, there is still a predisposition towards the incremental method due to use of infrastructure and utilization patterns as part of the variables in the criterion. A more needs based system of allocation would require the use of different indicators, such as for example population size, infant mortality and under-five mortality, as these have been shown to better promote equity (Chuma and Okungu, 2011).

CHAPTER 4: ASSESSMENT OF FINANCIAL RESOURCE FLOWS FOR HEALTH IN ZAMBIA

4.1. Actual resource flows to districts

4.1.1. Budgets Allocated to Districts

The Ministry of Finance and National Planning (MoFNP) provides budget projection with ceilings for 3 years under the MTEF to allow ministries, provinces and spending agencies to develop plans within the available resource envelope. The MoH in this process competes with other ministries/sectors to get a share of the total public funds. Thereafter, the Ministry of Health provides the strategic focus (derived from the National Development Plan and the National Health Strategic Plan), technical planning guidelines and budget ceilings to all health institutions annually. This information is used alongside other locally generated information from such sources as Health Management Information System (HMIS) and PA reports to prepare action plans, (MoH, 2011).

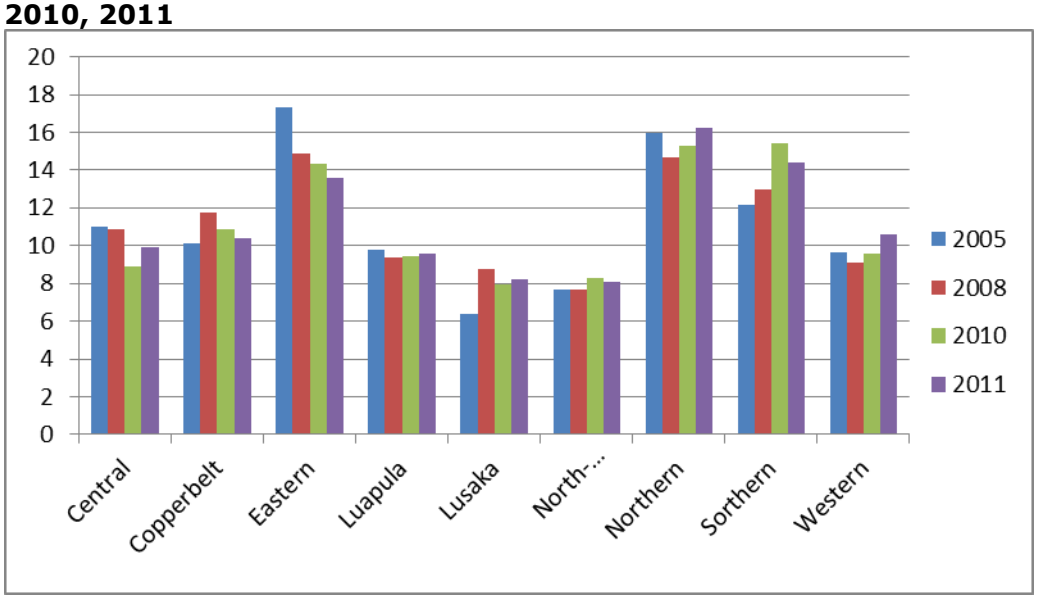
To develop the ceilings for the districts, the Ministry of health uses the resource allocation formula described in chapter three which assists in allocating funds according to need. This formula is applied to the recurrent budget of the 60% of health resources that go to districts, (60% include part of the donor funds that are aligned with government funds through the district basket, but does not include salaries and other capital funds). The districts then plan for activities in their respective districts, using standard planning guidelines and taking into account the ceilings given to them by the ministerial headquarters.

Figure 5 and table 8 show the actual Provincial budget allocations to district health services for the years 2005, 2008, 2010 and 2011. As can be observed, throughout the period under review, Eastern, Northern and Southern provinces received relatively higher proportions of funds for districts health services in absolute terms compared to other provinces. The lowest proportions of funds are allocated to Lusaka and North western provinces.

Generally, the figures presented below do not give a clear picture of how the revised resource allocation formula (implemented in the latter two years: 2010 and 2011) has influenced actual district resource allocations. The pattern is not consistent and shows fluctuations in some of the provinces over the four years of our interest. Eastern Province is an example of a province that experienced declining pattern in budget allocation throughout the period under review, even after the revision of the formula. Others are showing a fluctuating trend (namely; Central,

Copperbelt, Lusaka, Nothern and Western provinces) and still others hardly any change at all (Luapula, NorthWest).

Figure 5: Budget allocations to district health services by Province: 2005, 2008, 2010, 2011



The above are aggregated results (for provinces) and a more detailed analysis of the possible trends for individual districts within each province is attached as annex 1.

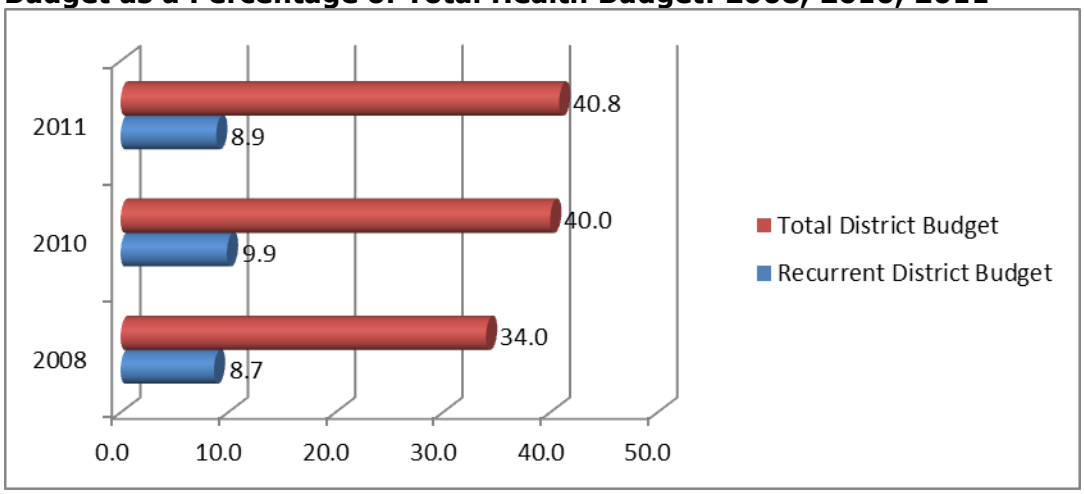
Table 8: Amounts and percentage allocations to Provinces for district health services: 2005, 2008, 2010, and 2011

		2005		2008		2010		2011	
	Provinces	**Budget (ZMK'M)**	**%**	**Budget (ZMK'M)**	**%**	**Budget (ZMK'M)**	**%**	**Budget (ZMK'M)**	**%**
1	Central	1,609	11%	9,197	11%	12,096	9%	15,366	10%
2	Copperbelt	1,480	10%	9,931	12%	14,749	11%	16,116	10%
3	Eastern	2,529	17%	12,569	15%	19,528	14%	21,089	14%
4	Luapula	1,428	10%	7,910	9%	12,841	9%	14,799	10%
5	Lusaka	933	6%	7,422	9%	10,776	8%	12,693	8%
6	North-Western	1,121	8%	6,495	8%	11,271	8%	12,522	8%
7	Northern	2,336	16%	12,414	15%	20,786	15%	23,570	15%
8	Sorthern	1,783	12%	10,999	13%	21,021	15%	22,336	14%
9	Western	1,409	10%	7,716	9%	13,007	10%	16,376	11%
Total		**14,628**		**84,653**		**136,074**		**154,868**	

Figure 6 shows budget allocations to districts as a percentage of total Government health budgets for three years, namely; 2008, 2010 and 2011, as well as the recurrent part of those district health budgets, as a % of total health budget. As can be seen from the graph, the percentage of total district budgets has increased from 34% in 2008 to 40.0% in 2010, after which it increased slightly further to 40.8% in 2011. However, the pattern is different for district recurrent budgets. As a percentage of total health budgets, districts allocated recurrent budgets increased

slightly immediately after applying the revised formula in 2010 to 9.9% from 8.7% in 2008. In 2011, the percentage allocation to districts recurrent budget dropped down to 8.9%, to almost that of 2008.

Figure 6: Budget Allocation to Districts for Recurrent Budget Only and Total Budget as a Percentage of Total Health Budget: 2008, 2010, 2011



4.1.2. Budgets Actually Released to Districts

This section assesses the release of funds to the districts, in order to ascertain whether the initially assigned budgets are actually followed when it comes to release of funds by the Ministry of Health. Table 9 shows the total budget releases to the health ministry against what was initially budgeted for and allocated to health by MoFNP. The table reveals that, for all the years, except 2011, the releases have been more than the budget allocation to health. The total amount released to districts in 2008 was 9% higher than the total budgeted amount and 11% higher in 2010. In 2011 however, the total release of funds to budgets was 12% below the budgeted amount (at 88%), partly because of the reasons mentioned in the methodology section for 2011 releases.

Depending on the demands of the ministry within a financial year, additional funds, called supplementary funding, is made available by the MoFNP to enable the ministry to adequately address its needs. To a certain extent, this depends on the absorption capacities of the different departments/units within the ministry. If their absorption capacities are low, the demands will be low and hence releases will be less as well.

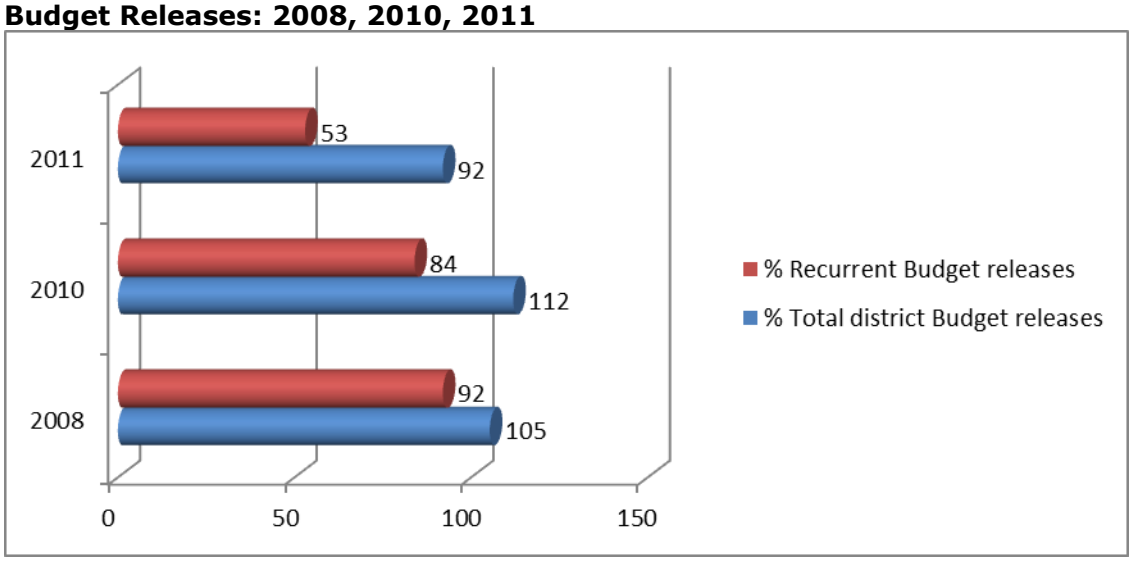
Table 9: Total releases to health against total budget allocation to health from MoFNP: 2005, 2008, 2010, and 2011

Year	Budget (ZMK)	Release (ZMK)	% released
2005	415,547,306,951	445,343,947,811	107%
2008	973,755,811,587	1,059,412,003,244	109%
2010	1,371,692,096,312	1,522,786,600,746	111%
2011	1,758,592,077,757	1,546,483,989,381	88%

Funds released to districts do not always correspond to districts initial allocations and are mainly determined by the actual resources available for disbursement to districts which depends on monthly releases from the Ministry of Finance and National Planning. If the resources available for disbursement is reduced or increased by a certain percentage, subsequently the district allocations are affected accordingly.

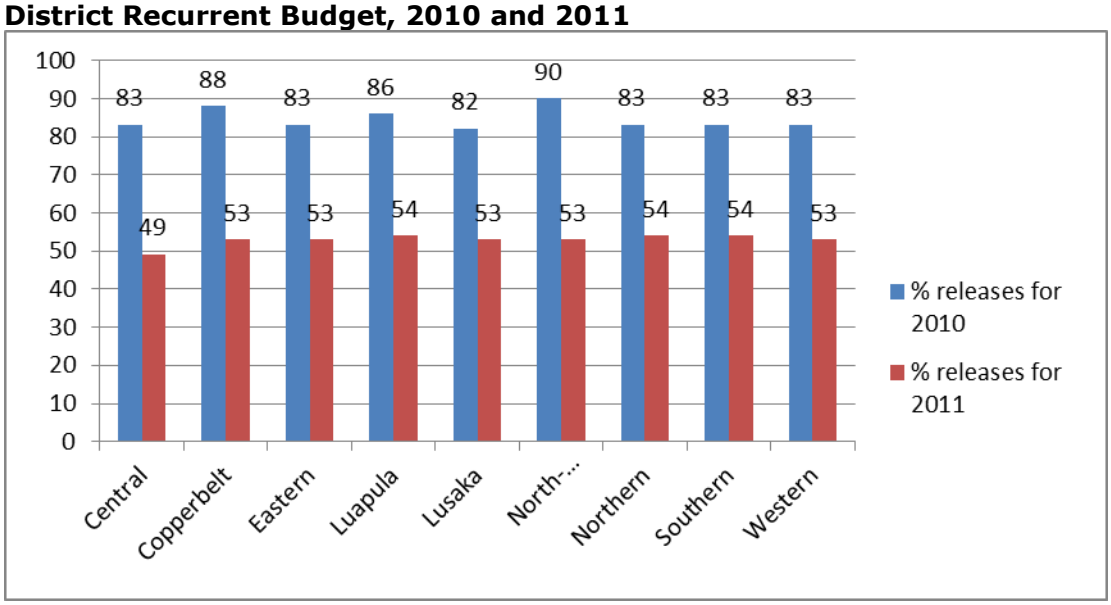
Figure 7 compares the percentage of actual releases to districts for total budgets and total recurrent budgets for the years 2008, 2010 and 2011. Although there are differences between the actual allocation to districts and what they actually receive for all the three years, one can notice from table 9 and figure 7 that funds released to districts somehow correspond to the total releases to MoH from MoFNP. However, the recurrent budgets suffer more from cuts since the salaries are mostly paid from state budgets, whereas recurrent budgets depend also on basket funds.

Figure 7: Comparison of Total District Budget Releases with Districts Recurrent Budget Releases: 2008, 2010, 2011



When it comes to allocating funds to district recurrent budgets, the Ministry uses the resource allocation as was stated above. Therefore recurrent budget becomes very important throughout this paper as it is at the centre of functional service delivery for district in Zambia, and is the budget subjected to the formula. Figure 8 compares percentage releases of district recurrent budgets as a percentage of total district recurrent budget allocation for 2010 and 2011. Despite, the total district releases being high, low attention is given to recurrent costs as can be demonstrated by the lower recurrent budget releases for both years.

Figure 8: Percentage Districts Recurrent Budget Releases of Total Allocated District Recurrent Budget, 2010 and 2011



To give a clearer picture of the districts recurrent budget releases, table 10 provides information on budget performances and compares releases against actual allocations for district recurrent budgets in 2005, 2008, 2010 and 2011. The table shows that most of the districts are likely to be in the same percentage range in each financial year. If there is a reduction in the amount of budget available for release to the districts, the loss is shared proportionately across all district budgets, and vise-versa for increased budgets.

Table 10: Districts by Percentage range of Recurrent Budget Released of Total Districts Recurrent Budget Allocation, 2005, 2008, 2010, and 2011

% range	Number of districts			
	2005	2008	2010	2011
100+	72	0	4	0
81-100	0	72	67	0
61-80	0	0	1	0
41-60	0	0	0	72
=/<40	0	0	0	0

Importantly to note in Table 10, is how 2011 releases differ from the other years under review. However, the withdrawal of donor support to the district basket in early 2009, did not affect government releases to districts as evidenced from the 2008 and 2010 figures, which shows hardly any differences.

4.1.3. Budget execution (actual expenditure)

Intra-district Expenditure

As part of the planning process, guidelines have been developed for the purposes of expenditures at district levels. The districts are able to determine what amount to spend on specific activities in line with the laid

down expenditure patterns outlined in the guidelines, (MoH, 1992, 2010). The guidelines, as highlighted in chapter 3, allow some degree of flexibility in expenditure levels by providing ranges within which appropriate expenditures can be made.

Table 11 shows that most funds are expended on health centre activities with 49%, 46% and 42% in 2008, 2010 and 2011, respectively. The lowest expenditures, as can be observed from the table, are made on community level activities, as per guidelines. Interesting about the results in this table is that, although health centres have been allocated the most resources, their allocation has been reducing over the three years, whereas funds allocated to districts health offices for administration has been increasing. Others have remained almost constant.

However, it is important to note that figures highlighted do not include other sources of funding outside the basket. The districts also receive direct funds from sources such as the Global Fund, GAVI and other donors, NGOs, user fees, the private sector and others, which do not go through the basket.

Table 11: District Health services Expenditure analysis by level of delivery, 2008, 2010 and 2011

	2008		2010		2011	
Per level	**ZMK' in Million**	**%**	**ZMK' in Million**	**%**	**ZMK, in Million**	**%**
DHO	11,301	15%	21,961	19%	18,072	22%
Hospital	17,019	22%	23,530	21%	19,236	23%
Health Centre	38,011	49%	53,226	46%	35,239	42%
Community	11,273	14%	16,172	14%	10,591	13%
Total	77,604	100%	114,889	100%	83,138	100%

4.2. Conformity to Resource Allocation Criteria and Guidelines

4.2.1. Overall District Allocation

As it has been stated in chapter 3, health sector allocation stipulates that 60% of all public health funds should be allocated to districts in order to enable them provide adequate care to their client/communities. The total allocation to the district as a percentage of total health budgets increased from 34% in 2008 to about 40% in both 2010 and 2011, (refer to Figure 6). Although the district budget is increasing, it is still far below the recommended 60% of public resources to districts by the Ministry of Health guidelines for district allocation. As stated earlier, in some cases, this is even made worse by the releases being lower than the actual budget, for instance 2011, which only received 92% of the allocated budget to districts. The picture may however, not be complete as these

funds do not include vertical and other earmarked funds flowing to the districts.
Table 12 shows percentage differences of proposed 60% allocation to the actual allocated resources to districts. The difference has been going down from 43% in 2008 to 33% in 2010 to about 32% in 2011. This is simply because the allocated proportion has been increasing over the three years reviewed.

Table 12: Actual Allocation to Districts against Proposed Allocation (60%), 2008, 2010 and 2011

Year	Total Budget (ZMK'M)	Proposed Target Allocation 60% (ZMK'M)	Actual Allocation to Districts (ZMK'M)	% Actual allocation to total health budget	% Difference
2008	973,756	584,253	331,331	34.0%	43.2%
2010	1,371,692	823,015	548,816	40.0%	33.3%
2011	1,758,592	1,055,155	718,229	40.8%	31.9%

Secondly, according to allocation guidelines (figure 3), the total allocated funds to districts is broken down as follows: 30% recurrent budget; 25% to drug; 15% capital; and 30% personnel Emoluments. However for the purpose of this paper, the focus will be on recurrent budget which is distributed using the formula of interest to this paper.

Although guidelines are there, they are usually not followed when it comes to actual allocation of resources to district recurrent budgets. What makes it even worse is the fact that releases are even much lower than the allocated amounts, as can be observed from figure 8.

A comparison of actual allocation against proposed allocation of district recurrent budgets shows that allocations do not conform to developed guidelines/formula. For the three years (2008, 2010 and 2011) districts were allocated lower than the proposed ones, with 2011 having the largest percentage difference of 27%.

Table 13: Actual Allocation vs. Proposed Allocation to District Recurrent Budget, 2008, 2010, 2011

Year	Allocation to Districts (ZMK'M)	Proposed Recurrent budget Target allocation 30% (ZMK'M)	Actual allocated Recurrent Budget (ZMK'M)	% of Actual allocation to Total Districts Budget	% Difference
2008	331,331	99,399	84,653	25.5%	14.8%
2010	548,816	164,645	136,074	24.8%	17.4%
2011	718,229	215,469	156,468	21.8%	27.4%

After the total amount for recurrent budgets for districts has been established, is the MoH then subjects it to a districts resource allocation formula in order to ascertain exactly how much is allocated to each

district in Zambia. Figure 9 shows the percentage distribution of public sector district health resources per province in 2010 and compares actual allocation to the proposed allocation according to the resource allocation criteria.

Although the formula has been developed, it is evident that the actual allocation of resources does not conform to the formula based allocation. Except for North Western Province whose allocation is in conformity with the formula, some provinces (like Eastern, Northern, Central and Luapula) received lower amounts than the formula based figures, whereas others (like Copperbelt, Lusaka, Southern and Western) received more than the required amounts according to the formula.

Figure 9: Actual Vs. Formula Based Percentage Allocation to District Health Services per Province Using the Revised Formula, 2010

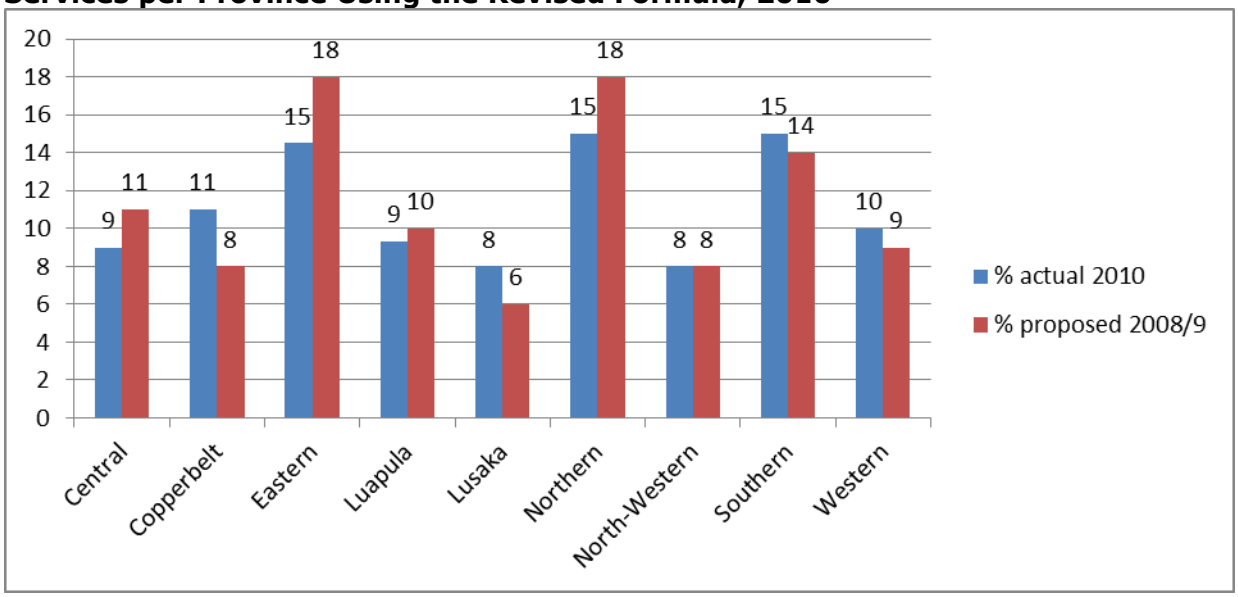


Table 14 is more detailed and shows the use of the newly revised resource allocation criteria in the calculation of district allocations for recurrent budgets. Only three districts (Nyimba, Kawambwa and Serenje) out of the 72 districts in Zambia were allocated funds in conformity with the resource allocation formula. The picture clearly shows that in most cases the actual allocations do not match with the formula based allocations. Although Lusaka was allocated the largest share in absolute terms, Livingstone had the widest discrepancy between actual allocation and formula based allocation, receiving 307% above the formula based figure. On the other hand, Mpika, Isoka and Mumbwa were the most disadvantaged districts with actual allocations being 48% less than the formula based allocation in all the three districts.

Table 14: Weighting the population (2010) with normalised Material Deprivation Index for 2010

District	MDI	Normalised Mat Dep Index Score	Population 2010	Weighted Population	% share of Population (2010)	Proposed Allocation (2010) ZMK'M	Actual Allocation, (2010) ZMK'M	Proposed Allocation Variance (ZMK'M)	% Difference
Livingstone	-4.24	1.41	139,509	196,708	0.3%	434	1,765	-1,331	-307%
Chililabombwe	-3.84	1.81	91,833	166,218	0.3%	367	1,279	-912	-249%
Luangwa	1.06	6.71	24,304	163,080	0.3%	360	1,235	-876	-243%
Mambwe	0.15	5.8	68,918	399,724	0.6%	882	1,845	-963	-109%
Luanshya	-3.68	1.97	156,059	307,436	0.5%	678	1,379	-700	-103%
Mufulira	-3.62	2.03	162,889	330,665	0.5%	729	1,366	-636	-87%
Kitwe	-4.53	1.12	517,543	579,648	0.9%	1,279	2,392	-1,113	-87%
Sesheke	0.5	6.15	99,384	611,212	1.0%	1,348	2,502	-1,153	-86%
Mazabuka	-1.63	4.02	230,972	928,507	1.5%	2,048	3,556	-1,508	-74%
Zambezi	1.04	6.69	80,306	537,247	0.9%	1,185	2,056	-871	-73%
Kafue	-3.68	1.97	227,466	448,108	0.7%	989	1,696	-708	-72%
Mufumbwe	0.58	6.23	58,062	361,726	0.6%	798	1,347	-549	-69%
Lusaka	-4.65	1	1,747,152	1,747,152	2.8%	3,854	6,350	-2,496	-65%
Chilubi	1.34	6.99	81,248	567,924	0.9%	1,253	1,913	-660	-53%
Gwembe	1.26	6.91	53,117	367,038	0.6%	810	1,190	-380	-47%
Itezhi-tezhi	0.35	6	68,599	411,594	0.7%	908	1,330	-422	-46%
Chavuma	1.66	7.31	35,041	256,150	0.4%	565	824	-259	-46%
Masaiti	-0.1	5.55	103,857	576,406	0.9%	1,272	1,828	-557	-44%
Namwala	0.65	6.3	102,866	648,056	1.1%	1,430	2,000	-570	-40%
Milengi	1.37	7.02	43,337	304,226	0.5%	671	927	-256	-38%
Kalulushi	-2.94	2.71	100,381	272,033	0.4%	600	810	-210	-35%
Kabwe	-3.13	2.52	202,360	509,947	0.8%	1,125	1,469	-344	-31%
Chingola	-3.51	2.14	216,626	463,580	0.8%	1,023	1,309	-287	-28%
Mporokoso	1.03	6.68	98,842	660,265	1.1%	1,457	1,832	-375	-26%
Chadiza	1.1	6.75	107,327	724,457	1.2%	1,598	1,923	-325	-20%

Lufwanyama	0.96	6.61	78,503	518,905	0.8%	1,145	1,332	-187	-16%
Kabompo	1.26	6.91	92,321	637,938	1.0%	1,407	1,609	-202	-14%
Chinsali	1.29	6.94	146,518	1,016,835	1.6%	2,243	2,558	-315	-14%
Mkushi	-0.31	5.34	154,534	825,212	1.3%	1,820	2,047	-227	-12%
Lukulu	1.33	6.98	86,002	600,294	1.0%	1,324	1,448	-124	-9%
Ndola	-3.81	1.84	451,246	830,293	1.3%	1,832	1,986	-154	-8%
Chama	1.06	6.71	103,894	697,129	1.1%	1,538	1,651	-113	-7%
Chiengi	1.4	7.05	114,225	805,286	1.3%	1,777	1,893	-117	-7%
Kazungula	1.05	6.7	104,731	701,698	1.1%	1,548	1,638	-90	-6%
Kalabo	1.31	6.96	128,904	897,172	1.5%	1,979	2,070	-91	-5%
Siavonga	1.05	6.7	90,213	604,427	1.0%	1,333	1,393	-60	-4%
Samfya	0.69	6.34	198,911	1,261,096	2.0%	2,782	2,850	-68	-2%
Mungwi	1.5	7.15	151,058	1,080,065	1.8%	2,383	2,424	-41	-2%
Nyimba	0.7	6.35	85,025	539,909	0.9%	1,191	1,193	-2	0%
Kawambwa	0.54	6.19	134,414	832,023	1.3%	1,835	1,838	-2	0%
Serenje	1.1	6.75	166,741	1,125,502	1.8%	2,483	2,479	4	0%
Kasempa	1.15	6.8	69,608	473,334	0.8%	1,044	1,003	41	4%
Sinazongwe	0.34	5.99	101,617	608,686	1.0%	1,343	1,285	58	4%
Solwezi	0.27	5.92	254,470	1,506,462	2.4%	3,323	3,100	223	7%
Shangombo	1.39	7.04	93,303	656,853	1.1%	1,449	1,346	103	7%
Kaputa	1.38	7.03	119,514	840,183	1.4%	1,853	1,718	136	7%
Kaoma	0.88	6.53	189,290	1,236,064	2.0%	2,727	2,510	217	8%
Katete	0.67	6.32	243,849	1,541,126	2.5%	3,400	3,084	315	9%
Monze	-0.29	5.36	191,872	1,028,434	1.7%	2,269	2,043	226	10%
Senanga	1.07	6.72	126,506	850,120	1.4%	1,875	1,638	238	13%
Choma	-0.43	5.22	247,860	1,293,829	2.1%	2,854	2,449	405	14%
Kasama	0.09	5.74	231,824	1,330,670	2.2%	2,936	2,502	433	15%
Mansa	0.56	6.21	228,392	1,418,314	2.3%	3,129	2,666	463	15%
Chongwe	-1.46	4.19	192,303	805,750	1.3%	1,778	1,494	283	16%

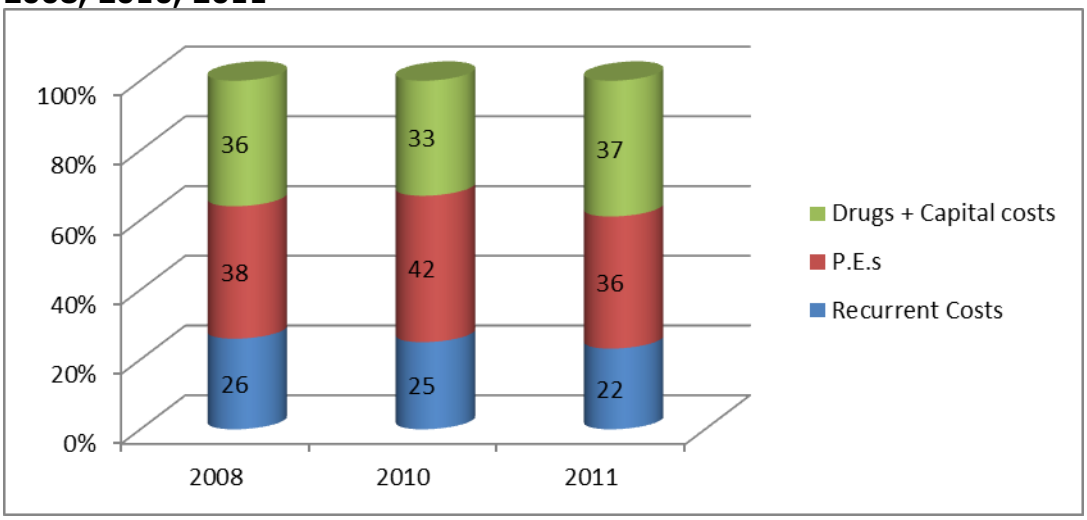
Mbala	0.78	6.43	203,129	1,306,119	2.1%	2,881	2,325	557	19%
Petauke	0.55	6.2	307,889	1,908,912	3.1%	4,211	3,389	822	20%
Mwense	1.25	6.9	119,841	826,903	1.3%	1,824	1,428	396	22%
Mpongwe	1.09	6.74	93,380	629,381	1.0%	1,388	1,069	319	23%
Lundazi	1.04	6.69	323,870	2,166,690	3.5%	4,780	3,548	1,232	26%
Nakonde	0.29	5.94	119,708	711,066	1.2%	1,569	1,156	413	26%
Kapiri Mposhi	0.23	5.88	253,786	1,492,262	2.4%	3,292	2,366	926	28%
Mpulungu	0.77	6.42	98,073	629,629	1.0%	1,389	977	412	30%
Kalomo	0.41	6.06	258,570	1,566,934	2.5%	3,457	2,372	1,085	31%
Mongu	0.13	5.78	179,585	1,038,001	1.7%	2,290	1,494	796	35%
Chibombo	-0.51	5.14	303,519	1,560,088	2.5%	3,442	2,158	1,284	37%
Mwinilunga	1.39	7.04	137,236	966,141	1.6%	2,131	1,332	799	37%
Luwingu	1.16	6.81	122,136	831,746	1.3%	1,835	1,021	814	44%
Nchelenge	1.03	6.68	152,807	1,020,751	1.7%	2,252	1,238	1,014	45%
Chipata	-0.17	5.48	455,783	2,497,691	4.0%	5,510	2,895	2,615	47%
Mpika	0.07	5.72	203,379	1,163,328	1.9%	2,566	1,347	1,219	48%
Isoka	0.75	6.4	138,158	884,211	1.4%	1,951	1,013	937	48%
Mumbwa	0.45	6.1	226,171	1,379,643	2.2%	3,044	1,576	1,467	48%

Source: MoH, 2010 budget allocation

4.2.2. Intra-District Allocation

Figure 10 gives an overview of how the total districts allocation is broken down by cost items for 2008, 2010 and 2011. According to the guidelines provided above in figure 3, 30% is to be allocated to recurrent costs, 30% to PEs and 40% collectively to Drugs and Capital costs. The allocations therefore, do not exactly match with the allocation criteria set by the Ministry of Health. Much more funds than originally planned are spent on Personnel Emoluments, leaving lesser proportions of funds to recurrent as well as drugs and capital costs.

Figure 10: Percentage Distribution of District Allocation of Funds by Cost Items: 2008, 2010, 2011



The Districts only have total control of the recurrent budgets, whereas drugs and capital funds are mainly controlled by the Ministry of Health Headquarters and the MSL for drugs. Salaries as shown by figure 1, are allocated directly from the Ministry of Finance and National Planning. The table 15 below therefore, summarizes district expenditure patterns for only recurrent budgets for 2008, 2010 and 2011, and reveals that to some extent district expenditure patterns have been slowly departing away from the allocation criteria within districts, by increasingly allocating more funds on District Health Offices administrative costs. In 2011 it was worse, with health centers allocation going below the threshold. Communities have also been receiving more than recommended allocations throughout the years under review. These not-withstanding, allocations to hospitals and health centres have been more in line with the guidelines, albeit at the lower limits of the range indicated.

Table 15: Actual Vs. Recommended Intra-District Allocation per Level of Service Delivery within Districts, 2008, 2010, 2011

	Recommended % Allocations	**2008**	**2010**	**2011**
Per level		**%**	**%**	**%**
DHO	15%	15%	19%	22%
Hospital	20-40%	22%	21%	23%
Health Centre	45-60%	49%	46%	42%
Community	10%	14%	14%	13%

CHAPTER 5: DISCUSSION

5.1. Introduction of the Conceptual Framework

The discussion is centered around the findings of this paper from the previous chapters and attempts to assess the financial resource allocation criteria in Zambia from an equity perspective. Equity, or need variables become extremely important in the development and implementation of a need-based resource allocation formula. The most widely used parameters to measure the relative needs of health care services across regions or geographical areas are:

i. Population size;
ii. Demographic structure and composition of the population;
iii. The disease situation in the population; and
iv. Socio-economic status, which includes poverty levels of the specified region, (Mclntyre D. et al. 2008).

Therefore, the discussions will be guided by the above mentioned parameters, with the inclusion of two other parameters, namely; i). Levels of service use, and ii). Differing costs, (Pearson, 2002). These parameters will together form our framework for discussion and will be developed around the following considerations of equity.

5.2. Assessment of the Formula

5.2.1. Need related to population size

In a country like Zambia where resources are limited and scarce, the need to link geographical distribution of resources with population is of no doubt extremely important. The findings have shown that population is much incorporated in the both formulae of 2004 and 2009. Population is actually used at two stages; firstly the district populations are in the computation of the district material deprivation index, and secondly weighted population, which is obtained by multiplying the normalized index score by the district population, is used to calculate percentage shares of the available resource. The population therefore, is a major determinant of how much resources are to be allocated. Example is Lusaka which was ranked the wealthiest district in 2010 based on its MDI, was proposed to be allocated 2.8% of the resources compared to 0.4% and 1.7% for Chavuma and Mungwi districts, respectively which were ranked the most deprived in that order. This is because Lusaka, despite being wealthier, has a much larger population than

the two districts. Chavuma, despite being the poorest, has a population of on 35, 041 inhabitants compared to Lusaka about 1,747,000 inhabitants. In the same way, Livingstone which was ranked third wealthiest district was proposed to get only 0.3% because of its small population and a low MDI.

However, although population density is indirectly incorporated in the formula by the inclusion of access indicators such as households' proximity to the nearest primary school, food market and boat/bus/tax transport, it is not directly and adequately covered, as was in the case of the1994 formula, highlighted above. Population density is an important consideration in the distribution of resources across districts as the provision of health services for a sparsely populated area tends to differ from that with a closely populated area. The limitation to this is the unreliability of the population figures during inter-censual period. The projected figures computed by the Central Statistical Office are seen as not being accurate and usually differ from head counts conducted by districts themselves in most areas.

5.2.2. Need related to demographic composition

Although the composition of the population, in terms of age and sex structures, is considered important by other countries, including Kenya which is using under 5 and women in reproductive age as some of the variables, Zambia has not attempted to incorporate this into all its formulae. These variables were initially suggested by RASC for inclusion in the 2004 formula, but have been ignored up to date, (MoH, 2006). It's a commonly used assumption that children under 5 years old and older population 65+ years, are more prone to ill health and hence tend to demand more health care services than other age group. On the other hand pregnant women have unique demands for health services, and hence a need-based formula needs to take this into consideration. Provincial population pyramids in Zambia show consistently higher proportions of women and under 5 years population in rural and remote provinces than in urban provinces. As mentioned earlier (chapter 1), children below age of 15 years make up 45.4% of the total population, and the age group constitute 48.6% of the total population in the rural areas and 40.5% of the total population in the urban areas. Similarly, the elderly population 65 years and above, make up 3.2% of rural population and 1.8% of urban population, (CSO, 2010). Worse still, secondary and tertiary health facilities are situated in the urban residences/provinces leaving the children and women in the rural areas handicapped.

5.2.3. Need related to disease situation/health indicators

The formula does not show a clear link between the districts epidemiological situation and the allocation of resources to district. Although a few disease indicators were included in the list of variables for deprivation index, they were not retained by the PCA since disease patterns were not responsible for much of the variation between districts. The material deprivation component, which accounted for the highest variation (58%) among districts was selected and was mainly associated with assets owned by households such as proportions of households with no electricity/gas/solar/candle for lighting etc, (MoH, 2004). This whole process makes the formula very unclear, and in a way disadvantages districts with high disease cases such as Kaputa, which experiences cholera outbreaks every year.

Secondly, even if a few health indicators were included on the initial list, they were more from preventive disease and such indicators are more appropriate for planning purposes, which is the second phase after allocation of resources using the formula. In addition such indicators are likely to create perverse incentives since the generation of these figures start at facility levels to districts and going upwards. Even when measures to eliminate them are to be taken, they will continue to influence the formula until it is revised to remove them. For this reason, and in line with the demographic composition section discussed above, districts maternal and child health indicators would be more appropriate to include in the formula.

5.2.4. Need related to socio-economic status

The extent to which poverty indicators are reflected in the financial resource allocation criteria is very important in addressing equity in provision of services. As stated above, the poor people are faced with the greatest burden of ill health and so any need based allocation needs to take cognizant of this. On the other hand, Zambia has vast land with some of the very remote rural areas found far from health facilities, making it difficult for people to access services. According to the results, the formula has attempted to address this by incorporating households poverty related variable, including literacy levels. The MDI used in Zambia tend to use more socio-economic indicators than any other indicators. Table 4 above showing the variables used in deriving the MDI has more poverty related indicators than others, most of which are on ownership and use of amenities. As a result of this the resource allocation tend to favour rural and remote areas more because of their relatively high poverty levels only, and leaving out other important considerations unique to urban districts.

5.2.5. Levels of Present Service Use

Other than just looking at needs from the client's perspective, in part, it is also important for resource allocation to be facility based (Pearson, 2002). As an example Kenya's resource allocation formula has attempted to take this into consideration by including bed use and outpatient case load. Although in Zambia, guidelines stipulate that hospitals receive 20-40% and health centres receive 45-60%, it is not clear how these figures were arrive at, and the process does not also give enough information on which facilities need more resources based on service utilization and workload. This makes the allocation not being quite transparent and unreliable to most stakeholders. In some cases Zambia uses number of beds as a criterion for allocating resources to hospitals, but the common argument to using the number of beds alone, is that this does not differentiate facilities that are busy from those that are less or not busy at all, (DFID, 2002). On the other side, inclusion of such indicators in a formula for hospitals may create perverse incentives to increase average length of stay of patients. Therefore, if this is not adequately taken care of in a resource allocation formula, it is likely to affect the supply side of service delivery as it would directly impact on the quality of services provided, especially for facilities with high levels of workload, but receiving relatively low amounts of funds.

5.2.6. Differing Costs

The cost of providing health services to a population varies from one geographical area to another depending mostly on remoteness. The 1994 formula for Zambia, included fuel pricing as a proxy for cost differentials. However, the current formula does not clearly show how cost differentials have been incorporated in the resource allocation formula. For instant, the proportion of households living more than 5km to boat/bus/taxi transport gives an indication of the population with access to transportation, but does not tell us anything about the cost of using a boat/bus/taxi across regions. Besides, health personnel are also majorly affected by higher costs as they spend more on transportation to get them to work places than those in areas with lower cost, but getting same salaries. Therefore, in order to try and motivate personnel equally across districts, this aspect has to be taken into consideration in the current formula

5.3. Implementation of the Resource Allocation Formula

The unavailability of reliable statistics at district level makes the implementation of the resource allocation criteria very difficult. Most of the information in the formula and variables used to compute the MDI are collected through the Census or surveys. This makes the information

outdated after some times resulting in people at district levels losing confidence in the output of the formula itself.

Secondly, although the formula is there and used during the planning and budgeting process, the actual allocations do not always conform to the formula based allocations. It is just used as a starting point after which other considerations are made which cannot be explained by the formula. The actual allocation is hence done in a manner which is not very transparent. Some districts like Livingstone and Chilabombwe were allocated much more than they are expected to get, and only 3 out of 72 districts were allocated in conformity with the formula in 2010, (refer to table 14). The reasons for these discrepancies are not explained. This situation continues to happen because there are uncertainties to how policy makers would react to sudden cutting of budgets from urban districts. Therefore, with the resource envelope remaining the same, it becomes impossible to adjust the figures for urban districts without affecting the rural districts. Secondly, there were arguments with MoH that if funds were to reduce drastically, it would impact negatively on service delivery and those districts which would receive sudden increases in budgets would face problems of absorption capacities, (Chitah and Masiye, 2010).

Thirdly, the resource allocation formula does not take into account districts other sources of funds. Although, user fees have been abolished for all primary care, districts still receive funds from various sources such as the mine companies in the Copperbelt and North-Western provinces, Non-Governmental Organizations (NGOs) and also vertical funding such as the Global funds and other Cooperation Partners (CPs) who choose to fund the sector vertically. Some districts tend to benefit more than others since in most cases donors opt to start by piloting their interventions in selected districts e.g. the eighteen (18) districts of Performance Based Financing in Zambia. It is often argued that donor funds exert some positive fungibility effects on local funds, which results in re-allocating local funds to other needy and crucial areas. However, if the funding structure is disintegrated, it is unlikely for a system to realize this objective as funds from different sources may unknowingly be spent on the same area or district. Besides, the proportion of funds subjected to the resource allocation formula is too small since recurrent budgets are now almost purely publicly funded, following the withdrawal of donor support to the basket and the collapse of the SWAp in 2009, (refer to figure 3).

Lastly, despite having revised the formula in 2008/09, there is still no emphasis on the need to review and update the formula over time. Zambia is a rapidly urbanizing country with the levels of urbanization varying from one province/district to another. At the moment there is enough new

information from the 2010 Living Conditions Monitoring Survey, HMIS and Census, of which most of it has not been factored into the formula to update the MDI. Moreover, as stated in chapter 1, the resource allocation technical working group to conduct periodic reviews of the formula and oversee the implementation process no longer exists. The implementation of the formula has been left in the hands of a few officers at the MoH, some of whom have little understanding of it. It therefore becomes very difficult to suggest ways of improving the formula or do periodical reviews for further suggestions on the formula.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

The manner in which health resources are allocated to different geographical areas is very important in meeting societal needs and at the same time responding to societal rights. If health care is viewed as a right, ethical principles need to be employed in the determination of the nature and structure of its delivery system. Therefore, developing a mechanism to allocate resources in a more scientific and transparent manner becomes a major step in realizing this objective, especially in a low income country like Zambia, where health resources are limited. However, it is clear that the Resource allocation formula/criteria to district health services in Zambia has not comprehensively covered all needy areas. The formula seems to have focused much more on poverty levels and remoteness of districts, and leaving out other important considerations/needy areas mentioned in the discussion above. Although the 2009 formula introduced issues of geographical deprivation, it brought little added value on the ground in as far as equitable allocation of resources is concerned. The real concerns, which would include linking disease occurrence as well as demographic composition variables (mentioned in the above discussion) to the formula, remain untouched. For as long as these variables are not adequately incorporated in the formula, the allocation will continue to provoke debates and doubts among all stakeholders including the policy makers.

Another thing coming out clear is that the implementation process of the formula is not closely monitored. The actual allocation still remains unclear and does not conform to the indicative figures derived from the formula. The situation is further worsened by the fact that released funds, in most cases, are not in conformity with actual allocation. Therefore, as efforts to further revise the formula continue to be made, focus should also be placed on possible ways of strengthening the implementation of formula so as to make it into a workable criteria and not simply an academic exercise as it appears to be.

Not-with-standing the above, the question is, should Zambia continue to invest in revising an input based financing mechanism, or should seriously consider shifting completely or partially towards output based financing mechanisms such as the Performance based financing (PBF)?

6.2. Recommendations

i. The Government of Zambia and CPs to explore ways of integrating resources and support to the health sector (or at least their monitoring) in order to avoid fragmentation of support, which dilutes the whole purpose of the resource allocation formula,

ii. A team of experts to carry out a further revision exercise to incorporate age/sex variables and properly link disease burden to the formula and other parameters mentioned in the discussion, to the extent that these variable cause population independent variations,

iii. The MoH to collaborate with the Central Statistical Office and other institutions conducting surveys in the data collection process so as to include relevant information to the formula and improve timeliness of data collection and dissemination,

iv. The Ministry of Health to continue building capacities at district and other levels on Health Management Information System (HMIS) so as to strengthen the data collection and analysis processes in order to have timely and reliable data,

v. There is a need to put in place a Resource Allocation Technical Working Group (RATWG) to oversee the implementation process of the resource allocation formula:

vi. The formula need to be simplified so as to make it more easily understandable by everyone involved in the allocation, including all stakeholder. This will increase transparency in resource allocation.

vii. The MoH should continue to explore possibilities of linking resource allocation to service output/production as in PBF,

viii. The allocation of resources being just one strategy of promoting equity, the MOH could also look at actual use of public expenditures through benefit incidence analysis (BIA), as a further mechanism to validate any future changes in allocation formulas.

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Appendices

Annex 1: Districts Recurrent Budgets and Releases, 2005, 2008, 2010, and 2011

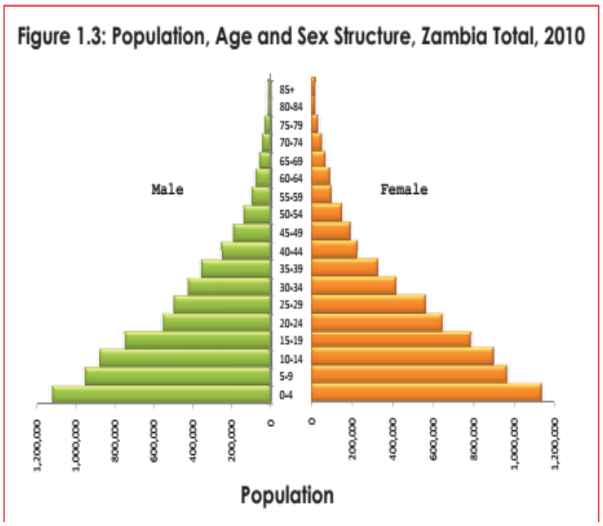
	Institution	2005 (ZMK'M)		2008 (ZMK'M)		2010 (ZMK'M)		2011 (ZMK'M)	
	Districts	**Budget**	**Released**	**Budget**	**Released**	**Budget**	**Released**	**Budget**	**Released**
1	Kabwe Urban	131	135	1,251	1,147	1,469	1,224	1,980	1,052
2	Kapiri-Mposhi	345	353	1,656	1,518	2,366	1,972	2,913	1,364
3	Chibombo	420	421	2,014	1,846	2,158	1,798	3,278	1,642
4	Mkushi	194	208	1,021	936	2,047	1,672	2,059	975
5	Mumbwa	268	275	1,360	1,246	1,576	1,313	2,534	1,280
6	Serenje	251	257	1,894	1,737	2,479	2,066	2,603	1,250
Central		**1,609**	**1,650**	**9,197**	**8,431**	**12,096**	**10,045**	**15,366**	**7,563**
7	Ndola-Urban	324	330	1,807	1,656	1,986	1,655	2,619	1,368
8	Chingola	101	103	901	826	1,309	1,091	1,626	703
9	Kalulushi	62	64	499	458	810	675	913	503
10	Kitwe	195	200	1,701	1,560	2,392	1,993	2,413	1,323
11	Luanshya	88	90	779	714	1,379	1,114	1,326	706
12	Lufwanyama	121	125	668	612	1,332	1,349	1,346	736
13	Masaiti	136	145	909	833	1,828	1,523	1,923	1,048
14	Mpongwe	322	347	1,293	1,185	1,069	891	1,360	717
15	Mufulira	88	94	776	711	1,366	1,607	1,403	754
16	Chililabombwe	44	46	598	553	1,279	1,066	1,187	656
Copperbelt		**1,480**	**1,544**	**9,931**	**9,108**	**14,749**	**12,964**	**16,116**	**8,515**
17	Chipata	605	622	2,759	2,529	2,895	2,413	3,890	2,039
18	Chama	163	171	820	752	1,651	1,351	1,623	839
19	Chadiza	179	184	932	854	1,923	1,602	1,895	996
20	Katete	364	372	2,340	2,145	3,084	2,569	3,314	1,836
21	Lundazi	500	512	2,214	2,029	3,548	2,898	4,003	2,115
22	Mambwe	87	89	526	482	1,845	1,538	1,008	534
23	Nyimba	136	139	733	672	1,193	994	1,445	777
24	Petauke	494	505	2,245	2,058	3,389	2,824	3,911	2,122
Eastern		**2,529**	**2,594**	**12,569**	**11,522**	**19,528**	**16,188**	**21,089**	**11,257**

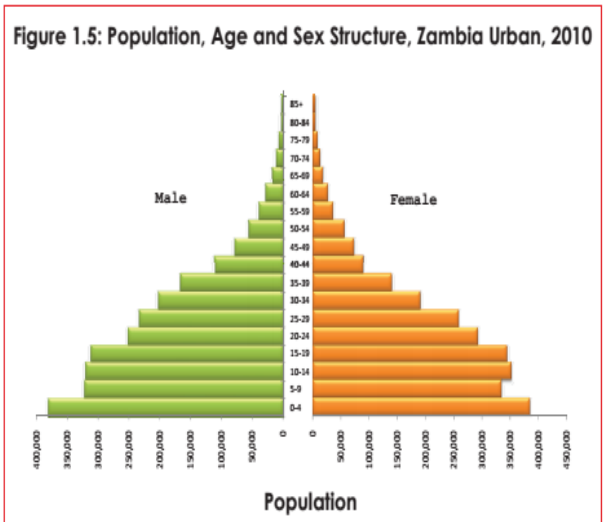
	Institution	2005 (ZMK'M)		2008 (ZMK'M)		2010 (ZMK'M)		2011 (ZMK'M)	
25	Mansa	315	322	2,203	2,020	2,666	2,222	3,210	1,717
26	Kawambwa	181	184	944	866	1,838	1,490	1,878	1,007
27	Chiengi	156	161	856	784	1,893	2,023	2,067	1,118
28	Milenge	54	55	380	348	927	773	922	472
29	Mwense	199	203	1,012	928	1,428	1,190	1,926	1,092
30	Nchelenge	212	217	1,051	963	1,238	1,031	1,926	1,010
31	Samfya	311	318	1,463	1,341	2,850	2,363	2,871	1,611
Luapula		**1,428**	**1,459**	**7,910**	**7,250**	**12,841**	**11,092**	**14,799**	**8,027**
32	Lusaka Urban	559	570	4,445	4,075	6,350	5,097	7,861	4,264
33	Luangwa	35	35	303	278	1,235	1,030	1,237	668
34	Chongwe	203	207	1,739	1,594	1,494	1,245	1,904	965
35	Kafue	137	141	934	857	1,696	1,462	1,691	777
Lusaka		**933**	**953**	**7,422**	**6,803**	**10,776**	**8,833**	**12,693**	**6,673**
36	Solwezi	373	388	2,400	2,200	3,100	3,287	3,371	1,812
37	Kabompo	142	145	760	697	1,609	1,341	1,562	866
38	Kasempa	99	101	578	530	1,003	836	1,201	580
39	Mwinilunga	234	239	1,146	1,051	1,332	1,110	2,155	1,151
40	Chavuma	61	62	402	368	824	687	829	416
41	Zambezi	127	129	685	628	2,056	1,797	2,058	1,084
42	Mufumbwe	87	88	524	480	1,347	1,094	1,346	744
North-Western		**1,121**	**1,152**	**6,495**	**5,954**	**11,271**	**10,151**	**12,522**	**6,652**
43	Kasama	279	285	1,379	1,264	2,502	2,017	2,773	1,420
44	Chinsali	246	251	1,183	1,085	2,558	2,131	2,484	1,349
45	Isoka	186	189	924	847	1,013	844	1,959	1,058
46	Kaputa	170	173	849	778	1,718	1,432	1,764	1,005
47	Chilubi	133	136	700	642	1,913	1,594	2,255	1,234
48	Luwingu	147	151	766	702	1,021	851	1,600	895
49	Mbala	277	283	1,329	1,219	2,325	1,937	2,699	1,360
50	Mpika	271	276	1,262	1,156	1,347	1,123	2,236	1,262
51	Mporokoso	142	145	763	699	1,832	1,526	1,792	1,002
52	Mpulungu	131	133	689	631	977	814	1,353	713

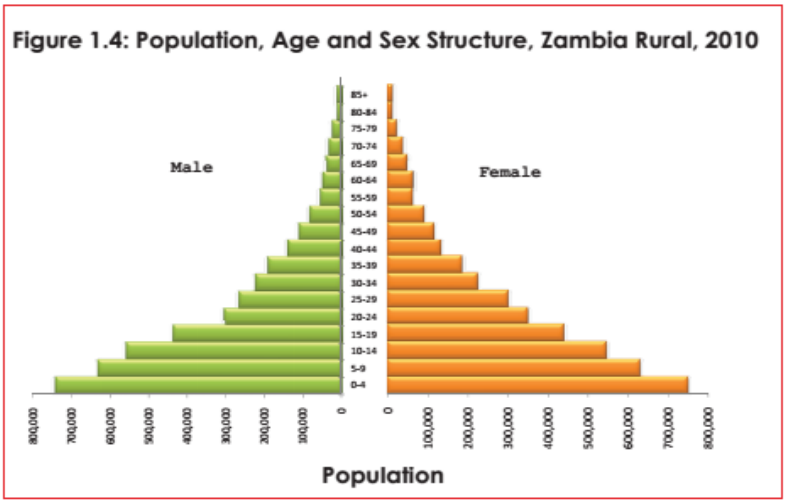
	Institution	2005 (ZMK'M)		2008 (ZMK'M)		2010 (ZMK'M)		2011 (ZMK'M)	
53	Mungwi	223	227	1,735	1,590	2,424	2,015	2,614	1,463
54	Nakonde	132	135	836	766	1,156	963	1,641	845
Northern		**2,336**	**2,385**	**12,414**	**11,380**	**20,786**	**17,248**	**25,170**	**13,606**
55	Livingstone	45	46	719	659	1,765	1,471	1,227	616
56	Gwembe	63	64	431	395	1,190	963	1,190	652
57	Itezhi-tezhi	82	83	508	466	1,330	1,088	1,333	751
58	Kalomo	286	295	1,449	1,328	2,372	1,977	2,696	1,467
59	Kazungula	128	131	704	645	1,638	1,365	1,642	921
60	Choma	266	272	1,481	1,357	2,449	1,933	2,937	1,562
61	Mazabuka	288	294	2,170	1,989	3,556	3,110	3,692	1,882
62	Monze	259	265	1,338	1,226	2,043	1,702	2,620	1,465
63	Namwala	147	150	839	769	2,000	1,711	1,993	1,118
64	Siavonga	90	93	575	527	1,393	1,154	1,406	763
65	Sinazongwe	128	148	786	721	1,285	1,071	1,600	892
Southern		**1,783**	**1,842**	**10,999**	**10,083**	**21,021**	**17,544**	**22,336**	**12,089**
66	Mongu	266	271	1,310	1,201	1,494	1,245	3,737	1,891
67	Kaoma	299	307	2,103	1,928	2,510	2,092	2,930	1,632
68	Lukulu	135	138	718	658	1,448	1,192	1,470	780
69	Kalabo	220	224	1,094	1,003	2,070	1,725	2,250	1,185
70	Senanga	207	211	1,011	926	1,638	1,365	2,043	1,096
71	Sesheke	138	141	740	678	2,502	2,085	2,465	1,411
72	Shang'ombo	144	147	740	678	1,346	1,121	1,481	763
Western		**1,409**	**1,440**	**7,716**	**7,073**	**13,007**	**10,825**	**16,376**	**8,756**
Total District Recurrent Budget		**14,628**	**15,019**	**84,653**	**77,604**	**136,074**	**114,890**	**156,468**	**83,139**
Total MoH Budget		**628,520**		**973,756**		**1,371,692**		**1,758,592**	

Source: MoFNP, 2005, 2008, 2010, 2011

Annex 2: Population age/sex structure, Zambia total, urban and rural, 2010







Source: CSO, Census 2010

Annex 3: Variables initially proposed by the RASC

Proposed parameter	Rationale for selecting proposed parameters	Assumptions	Examples of weight estimates
Population number	Population number is obviously important.	CSO can provide accurate population information in age and sex groups at district level.	Each individual x 1.0
Population by age	Children and young adolescents could be seen as vulnerable groups.	As above.	No of children in each age group: 0-4 = x 1.0 5-11 = x 0.5 12-19 = x 0.25
Population by gender	Female literacy is considerably lower than male literacy. Female disease burden including maternal mortality is very high.	As above.	No of female population between15 – 44 = x 0.25
Levels of poverty/deprivation	Poverty is a powerful indicator for health problems.	CSO can provide accurate poverty data by districts.	Poverty measure: -10% = 1.1 -15% = 1.15 etc
Population density	Proxy for transportation needs and hence costs.	CSO can provide accurate data at district level.	Deviation from median: -20% = 1.05 -40% = 1.1 etc
Health problems: Maternal Mortality Rate as sub-indicator	MMR is a strong indicator, reflecting access to and availability of qualified health care	HMIS should be able to accurately and timely capture relevant data.	MMR 110% of national = 1.05 ;120% = 1.1 etc
Refugees	Refugee populations are vulnerable groups adding to health care strain.	Information on refugee flows and residence can be obtained from UNHCR.	?

Needs for staff incentives in hard-to-reach areas	Human resources are the main production factor. Districts with facilities in hard-to-reach areas cannot easily attract qualified staff.	CBoH Human Resource database is in place and provides accurate information at district level. All health facilities are GIS mapped.	Three levels only: x 1.0 x 1.1 x 1.2
Extra costs for transports	Districts with needs for boat (or air) transports need more resources.	Special assessment – possibly as separate phase of fixed costs.	Three levels: x 1.0 x 1.1 x 1.2
Discounting	Population in districts provided with additional external funding are better off than districts without such funding.	CPs, Global Funds and NGOs are willing to provide accurate information on non-basket funding to districts.	GRZ allocation reduced by 30% (50% ?; 70% ?)of external contributions?
Fixed allocation	There is a minimum staff and infrastructure needed for each DHMT.	The fixed allocation could be estimated through an average of the costs of the five smallest DHMTs.	30 mKwacha annually ?

Source: MoH, 2004