CHAPTER 3

RESEARCH METHODOLOGY

This is a descriptive time series study. The study concerns itself with the macro level, using process indicators of budget allocation to regions in Ghana to access equity regarding population health needs from 1997-2001. The main allocation criteria - access, poverty and health status are adjusted on the population of a region to calculate expected budget which are compared to actual budget allocated to a region at a particular year to access alloctive equity.

It is acknowledged that improvement in health outcomes goes beyond equitable and efficient distribution of health resources. Understanding the relationship between equitable allocation of health resources and health is useful. Targeted resource flows have a great part to play in improving health, reducing inequalities and ensuring financial access to services by the poor. There is paucity of evidence, which suggest that resource flows influence access to services and eventually health status though there are clearly many determinants of health. IMF working paper 1999, quoting World Bank report 1993, indicated that it has been shown that the burden of disease in developing countries could be reduced greatly if governments were to make available a minimum package of essential, cost effective clinical services.

Nations, developed and developing are faced with the problem of health resources limitations. It is incumbent on health authorities to target health resources in the best possible way in order to gain the most benefit, and to solve the most important health problems. This requires setting priorities and making choices. Overall trade off allocative efficiency for allocative equity is always the prime option for policy-makers since the vast majority [of people] would elect for equity to be a prime consideration [of a health services].

The first element of any equitable allocation formula is the population. Resources, at the most simple level, should be allocated to regions and districts on the basis of their population. Such allocation formula needs a good population data, which may not be readily available especially in developing countries. There is international growing literature on ways of re-orienting resource allocation so that systems are more responsive to the local health needs. Countries as diverse as Canada, South Africa, the United Kingdom and Australia uses formula for allocating resources based on needs as defined by the size and the characteristic of the population (Flagship Module 7)

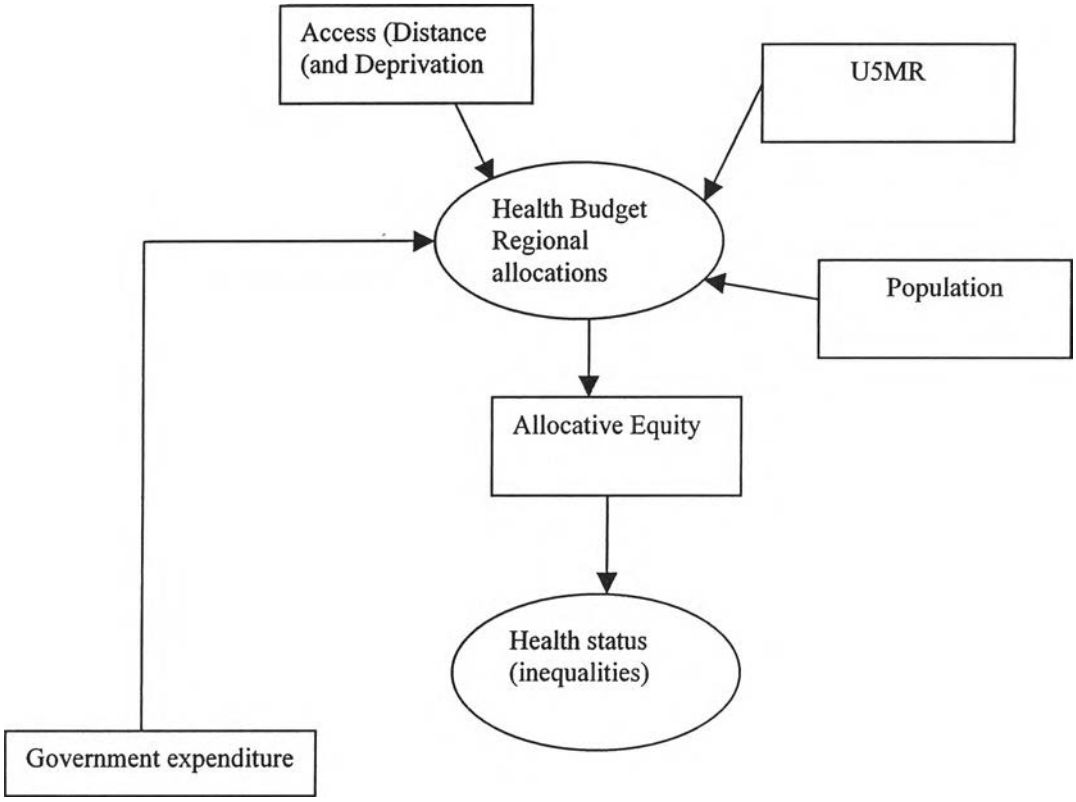
The resource allocation formula developed in England by the Resource Allocation Working Party (RAWP) is adapted and modified in this study. RAWP model = WP = POP (1+a) (1+n) (1+c), where POP is the authority's unweighted population, a is the age adjustment for the authority, n is the need adjustment and c is the relative cost adjustment and WP is the weighted population.

In this study the main allocation criteria used by MoH, Ghana - access, poverty and health status (U5MR) are adjusted on the population of a region to calculate expected budget which are compared to actual budget allocated to a region at a particular year to access alloctive equity.

3.1. Study framework

Actual budget allocation to a region depends on many factors, it is important to note these factors to help give a good understanding. The study framework is based on a model that characterises the determinants of budget allocation to regions according to population needs. In this study, population, U5MR, and access are selected as the main variables affecting budget allocation to regions in Ghana.

Figure 3.1. Study framework



3. 2. Variables reflecting budget allocation

U5MR is used as the proxy for health status in this study. The higher the rate indicates the level of inequality in health outcome and therefore requires more resources to improve the situation.

U5MR = the number of children who die before their fifth birthday per 1,000 live birth.

Population is the beneficiary of any allocation made to the region and is the main factor upon which all other factors are adjusted.

Population = is the total number of people living in a region at particular period of timeusually one year.

Access is how available is health facilities to the people living in a region. It is of two kinds, financial and geographical

Financial access = the number of people living below the poverty line (nutritional based poverty).

Geographical (cost) = how long people have to travel to access health care services.

Regional budget = total financial resources allocated all BMCs in a particular region in particular fiscal year

3. 3. Means of evaluation and comparison of allocative equity

In this study, population is adjusted on the main criteria for budget allocation. Equity like 'beauty' is the state of the mind and therefore has no specific satisfactory definition. In most cases there is a trade off between efficiency and equity. Based on the principles of equal opportunity equity is defined in this context as equal expenditure resources for equal needs, - means allocation of resources to a particular group or geographical area in proportion to its health needs or demands. Thus the differences in the share of health resources among people may indicates the degree of inequality of resources distribution among regions. This gives overview of the degree of inequity that provides recipe for policy change to improve equity. In this study it is assumed that regions have equal efficiency as well as social welfare weight in resources allocation.

a. Resource flow under the PoW

One of the main concerns of the first year programme of work is to increase the overall resources and ensure equitable and efficient distribution of resources in the health sector. This was aimed at arresting the shrinking resource flow in the health sector, coordinate allocation of health resource to priority areas to improve access especially in rural deprived areas to bridge urban –rural dichotomy and improve health outcomes. To achieve this aim a common pot was establish under the programme of work to mobilize funds from both the government and its development partners. Budget in this study is a composite of GoG, donor and IGF. The two main sources of funding to the health sector are government (GoG) and donors. The annual health budget expenditures from 1997 – 2001 were analyzed and compare, to determine whether the programme of work did mobilize more resources for the health sector.

b. Allocative equity

In health care, equity is always cited as a goal of public health care system. Policy makers may wish to weight allocation or capitation by relative needs such as population, cost variation, income, and mortality among others.

In measuring the needs of a region it is inevitable that proxies are used. The main dimensions of need are:

1. Size of population – adjusted for age and sex for small area allocation.
2. Health status – proxied by infant, child or adult mortality (U5MR)
3. Financial access to care – proxied by people living below poverty line
4. Cost of care – proxied by average distance to health facilities or regional difference in cost of inputs such as staff and medicines, if available

The proposed allocation formula is shown below. It is driven by the size of the population (pop_I) the relative under five mortality rate ($U5MR_i$), the proportion of the population below the poverty line (D_i), the average distance to sub district facilities, as proxy for distance cost (d_i).

Population is seen as the main factor of allocation upon which other socioeconomic factors are adjusted to reflect the needs of the local people.
The three variables are given equal weight due to insufficient data on all the factors. This means that resources are shared equally between all the three variables ($a_1 = a_2 = 1/3$).

The above factors were selected for population adjustment based on

1. National allocation criteria (national policy)
2. On literature search (e.g. use by the England RAWP, South Africa and Canada)
3. It is assumed that they reflect the true health needs of the population.

Regional population for the various years were adjusted on distance, U5MR, and poverty to determine the population need of each region per a particular year.

Weighted population (wp_i) for U5MR (a_1) and the poor (a_2) is given as

$$wp_i = \left[(1 - a_1 - a_2)\frac{d_i}{d_G} + a_1\frac{U5MR_i}{U5MR_G} + a_2\frac{D_i}{D_G}\right]pop_i \qquad (1)$$

Where a_1 and a_2 are national policy weights for under five mortality rates and deprivation (poverty). The weights reflects on the government health policy, which gives much priority to the health of the poor, maternal and child health. wp_i is the weighted population.

The allocation for region *i* is given as:

$$Allocation_i = \frac{\left[(1-a_1-a_2)\frac{d_i}{d_G} + a_1\frac{U5MR_i}{U5MR_G} + a_2 D_i\right]pop_i}{\sum_{j=1}^{10}\left[(1-a_1-a_2)\frac{dj}{dG} + a_1\frac{U5MR_j}{U5MR_G} + a_2 D_j\right]pop_j} \qquad (2)$$

d_j = summation of regional average distances to districts

d_G = average national distance to district

$U5MR_j$ = summation of adjusted regional U5MRs

$U5MR_G$ = national U5MR

D_i = regional poverty line

D_j = national poverty line

Pop_i = regional population

pop_j = national population

Calculation of expected budget for region $_i$ is given as

$$\text{Expected budget of region}_i \; EB = \left[\frac{Wp_i}{\sum_{i=1}^{10} Wp_i}\right]\left[\sum_{i=1}^{10} AB_i\right] \qquad (3)$$

WP = weighted population by U5MR and poverty

EB = expected budget allocation of region

AB = actual budget allocation

i = subscript of region

Inequity ratio is define as

$$Ratio\ of\ \text{region}_i \quad RR_i = \frac{AB_i}{EB_i} \qquad (4)$$

RR = ratio of expected budget allocation and actual budget allocation

EB = expected budget

AB = actual budget

i = subscript of region

RR= 1 , means equity, i.e. actual budget is equal to expected budget

RR < 1 or > 1 means inequity

RR < 1, means a region's actual budget received was less than expected budget.

RR > 1 means a region's actual budget received was more than expected budget.

The weights given to population adjusted by mortality (a_1) and deprivation (a_2) are important policy variables. Choice of these parameters depends partly on the emphasis given to the relative weights given to general population health care, health care for children and health care for the poor, which is the primary aim of this study as well, a national policy direction. The average distance is based on distribution of primary level facilities across the region. This study would allocate resources equally between all the three factors (proxies)equal allocation between all the three criteria. ($a_1 = a_2 = 1/3$)

3. 4. Sensitivity analysis

Looking at different scenarios to see how the results of equal allocation differ from alternative health policies with different priorities sensitivity analysis was carried out. Different weights were given to U5MR, distance and poverty to carry out sensitivity analysis.

1. Allocation based on population adjusted on relative U5MR i.e. policy direction with maternal and child as top priority ($a_1 = 1$, $a_2 = 0$).

2. Allocation based on population adjusted for deprivation (poverty) as a top priority ($a_1 = 0$, $a_2 = 1$).

3. 5. Construction of inequity index

Equity is always cited as a goal of public health care system, to help set policies to promote equity in health care it is important to develop measures to identify the inequality in the distribution of health resources. The concept of Gini was employed to calculate the degree of inequities in resources distribution across regions under the PoW.

$$G = \frac{2\,\mathrm{Cov}(x, F)}{\mu}$$

Where x is the variable to be evaluated. In this case x is the budget allocation ration derived from actual and expected budget from equation (4)

F is the cumulative distribution of x

μ is the mean

Gini is the ratio of the area between the line of absolute equality (the egalitarian line) and the actual distribution curve (Lorenz curve). The value of Gini coefficient ranges from zero to one (0 to1). Perfect equality means zero Gini coefficient and the Lorenz curve will be diagonal. While Gini coefficient of one is equal to perfect inequity i.e. one takes all the resources.

3. 6. Data collection

The study population includes all the ten regions in Ghana. This study collected secondary data from the following sources:

Ministry of Health annual budget books and policy and budget statements:-
MoH national annual budget allocations, Ministry of Health budget allocations to regions 1997-2001.
Center for Health Information, MoH
Data on U5MR and access to health care
National Statistical office, and the Ministry of Local Government and Rural Development :-.Regional population .
National Development Planning Commission, and the GPRS office:- Data on poverty.

Regional budget consists of financial allocations to all BMCs under the Regional Health Administration of the MoH. Regional BMCs includes; - Office of the Regional Director, Regional Health Administration, Regional Clinical Care, Regional Public Health, Regional Hospital, District Health Administration, District Hospitals, and Sub-districts